

SYNTHETIC ORGANIC CHEMICALS

United States Production
and Sales, 1986

(Investigation No. 332-135)



USITC PUBLICATION 2009

SEPTEMBER 1987

United States International Trade Commission - Washington, DC 20436

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UNITED STATES INTERNATIONAL TRADE COMMISSION

SYNTHETIC ORGANIC CHEMICALS

United States Production and Sales, 1986

**U.S. Government Printing Office
Washington: 1986**

USITC Publication 2009

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This report was prepared principally by Cynthia B. Foreso, Jesse Lawrence Johnson, Dr. Aimison Jonnard, Eric Land, Edward Matusik, David Michels, Elizabeth R. Nesbitt, James Raftery, Edward J. Taylor, Cynthia Trainor, and Steve Wanser.

Assistance in the preparation of the report was provided by Kenneth R. Kozel, Gwen L. Bennett, Brenda Carroll, Sharon Greenfield, Chris Romett, Lemuel Shields, and Wanda Tolson. Automatic data processing input was provided by Barbara Bobbitt, James Gill, and Marie Jagannathan.

Address all communications to
Kenneth R. Mason, Secretary to the Commission
United States International Trade Commission
Washington, DC 20436

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SYNTHETIC ORGANIC CHEMICALS, 1986

INTRODUCTION

This is the 70th annual report of the U.S. International Trade Commission on domestic production and sales of synthetic organic chemicals and the raw materials from which they are made. The report consists of 15 sections, each covering a specified group (based principally on use) of organic chemicals as follows: Tar and tar crudes; primary products from petroleum and natural gas for chemical conversion; cyclic intermediates; dyes; organic pigments; medicinal chemicals; flavor and perfume materials; plastics and resin materials; rubber-processing chemicals; elastomers; plasticizers; surface-active agents; pesticides and related products; miscellaneous end-use chemicals and chemical products; and miscellaneous cyclic and acyclic chemicals. Data have been supplied by approximately 747 producers.

Each of the 15 sections is headed by a summary of the statistical data. The first table in each section gives statistics on products and groups of products in as great detail as is possible without revealing the operations of individual producers. Statistics for an individual chemical or group of chemicals are given only when there are three or more producers, no one or two of which may be predominant. Moreover, even when there are three or more producers, statistics are not given if there is any possibility that their publication would violate the statutory provisions relating to unlawful disclosure of information accepted in confidence by the Commission.¹

Data are reported by producers for only those items where the volume of production or sales or value of sales exceeds certain minimums. Those minimums for all sections are 5,000 pounds of production or sales or \$5,000 of value of sales with the following exceptions: Plastics and resin materials—50,000 pounds or \$50,000; pigments, medicinal chemicals, flavor and perfume materials, and rubber-processing chemicals—1,000 pounds or \$1,000. They are usually given in terms of undiluted materials; however, products of 95 percent or greater purity are considered to be 100 percent pure. Commercial concentrations are applicable for dyes, certain plastics and resins, and a few solvents; such concentrations are specifically noted.

The statistics given in this report include data from all known domestic producers of the items covered and include the total output of each company's plants, that is, the quantities produced for consumption within the producing plant, as well as the quantities produced for domestic and foreign sale. The quantities reported as produced, therefore, generally exceed the quantities reported as sold. Some of these differences, however, are attributable to changes in inventory.

The second table in each section lists all items for which data on production or sales have been reported, by primary manufacturers, identified by manufacturers' codes. Each code consists of not more than three capital letters and is assigned on a permanent basis.

The third table in each section is a directory, alphabetized by the codes of the manufacturers reporting in that section.

Appendix A is a directory, alphabetized by the names of the manufacturers reporting in all sections and which includes their general corporate phone numbers and office addresses.

Appendix B lists synonymous names for cyclic intermediates. Information on synonymous names of the organic chemicals included in this report may be found in the *SOCMA Handbook: Commercial Organic Chemical Names*, published by the Chemical Abstracts Service of the American Chemical Society, or the *Colour Index (Revised Third Edition)*, published jointly by the Society of Dyes and Colourists and the American Association of Textile Chemists and Colorists.

Appendix C presents the data in this report aggregated in the format of the Harmonized System (HS) nomenclature on a 6-digit HS basis.

Appendix D is an alphabetical index of all the products in this edition of the report.

¹ 18 U.S.C. § 1905 and 44 U.S.C. § 3508.

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Data contained in this report are compiled primarily from Commission's questionnaires sent to domestic producers and represent the best data available to the Commission. While the data supplied in the questionnaires are checked against data previously supplied by the submitting firm and with data supplied by other domestic producers, data are not independently verified by direct Commission examination of the books of companies furnishing information. Data contained in this report should not be used for investment and other purposes without independent verification.

As specified in the reporting instructions sent to manufacturers, production and sales (unless otherwise specified) are defined as follows:

PRODUCTION is the total quantity of a commodity made available by **Original Manufacturers Only** within the customs territory of the United States (includes the 50 States, the District of Columbia, and Puerto Rico). It covers synthetic organic chemicals, specified crudes from petroleum and coal tar, and certain chemically described natural products, such as, alkaloids, enzymes, and perfume isolates. It is the sum—expressed in terms of 100% active ingredient unless otherwise specified in the reporting instructions—of the quantities:

Produced, separated, and consumed in the same plant or establishment. A Commodity is considered separated either when it is isolated from the reactive system or when it is not isolated, but weighed, analyzed, or otherwise measured. This includes by-products and co-products that are not classifiable as waste materials;

Produced and not isolated, but directly converted to a finished or semifinished item not included in this report (e.g., polyester film, polyurethane tires, nylon fiber, bar soap, etc.). (See specific instructions in individual sections);

Produced and transferred to other plants or establishments of the same firm or 100% owned subsidiaries or affiliates;

Produced and sold to, or bartered with, other firms (including less than 100% owned subsidiaries);

Produced *for others* under toll agreements (see general instructions);

Produced and held in stock.

PRODUCTION EXCLUDES:

Purification of a commodity, which is purchased by, or transferred from within, the company, unless inclusion of such processing is specifically requested in the reporting instructions for individual sections; Intermediate products which are formed in the manufacturing process, but are not isolated from the reaction system—that is, not weighed, analyzed, or otherwise measured; except such products as described above as being produced and not isolated, but directly converted to a finished or semifinished item.

Materials that are used in the process but which are recovered for re-use or sale;

Waste products having no economic significance.

SALES are actual quantities of commodities sold by **Original Manufacturers Only**. Sales include the quantity and value of:

Shipments of a commodity for domestic use or for export, or segregation in a warehouse when title has passed to the purchaser in a bona fide sale;

Shipments of a commodity produced for you by *others* under toll agreement;

Shipments to subsidiary or affiliated companies, provided the ownership is less than 100%.

SALES EXCLUDES:

All intra-company transfers within a corporate entity;

All shipments to 100% owned subsidiary or affiliated companies;

All resales of imported or purchased material, including materials obtained by barter;

All shipments of commodity produced *for others* under toll agreements.

VALUE OF SALES is the net dollar receipts of sales f.o.b. plant or warehouse, or delivered. F.o.b. values are preferred, but if they are not readily available from your records, delivered values are acceptable.

SUMMARY

Combined production of all synthetic organic chemicals and primary products from petroleum and natural gas in 1986 was 350,859 million pounds—an increase of 6.6 percent from the output in 1985 (which also included data on tars) (table 1). Sales of these materials in 1986, which totaled 184,454 million pounds, valued at \$65,486 million, were 6.6 percent larger than in 1985 in terms of quantity and 2.7 percent more in terms of value. These figures include data on production and sales of chemicals measured at several successive steps in the manufacturing process, and, therefore, they necessarily reflect some duplication. During 1982–86, the total output of these products rose each year except for 1985 (figure 1). During that period the output of these products generally followed the trend of the Federal Reserve Board Index of U.S. Production.

In 1986, production of all synthetic organic chemicals, including cyclic intermediates and finished products totaled 235,267 million pounds, or 4.7 percent more than the output in 1985. Eleven sections showed an increase in production in 1986 over 1985. Rubber-processing chemicals (324 million pounds) increased by 24.6 percent; medicinal chemicals (264 million pounds) increased by 17.5 percent; cyclic intermediates (50,193 million pounds) increased by 10.3 percent; surface-active agents (5,895 million pounds) increased by 9.9 percent; organic pigments (89 million pounds) increased by 9.5 percent; elastomer (synthetic rubber) (4,081 million pounds) increased by 6.6 percent; dyes (236 million pounds) increased 6.0 percent; plastics and resin materials (52,447 million pounds) increased by 4.9 percent; miscellaneous end-use chemicals and chemical products (23,033 million pounds) increased by 3.7 percent; miscellaneous cyclic and acyclic chemicals (95,666 million pounds) increased by 1.9 percent; plasticizers (1,722 million pounds) increased by 0.7 percent; of the remaining sections, flavor and perfume materials (138 million pounds) showed a decreased in 1986 of 9.0 percent from that in 1985; and pesticides and related products (1,180 million pounds) decreased 4.4 percent.

Table 1
Synthetic organic chemicals and their raw materials U.S. production and sales, 1985 and 1986

Chemical	Production		Increase or decrease (-), 1986 over 1985 ¹ Percent	Sales					
	1985	1986		Quantity			Value		
				1985	1986	Increase or decrease (-), 1986 over 1985 ¹ Percent	1985	1986	Increase or decrease (-), 1986 over 1985 ¹ Percent
	Million pounds	Million pounds		Million pounds	Million pounds	Percent	Million dollars	Million dollars	Percent
Grand total ²	329,186	350,859	6.6	173,078	184,454	6.6	63,783	65,486	2.7
Tar	(³)	2,046	(³)	(³)	(³)	(³)	(³)	(³)	(³)
Primary products from petro- leum and natural gas	104,484	113,545	8.7	49,885	53,035	6.3	7,810	6,020	-22.9
Synthetic organic chemicals, total ²	224,702	235,267	4.7	123,193	131,419	6.7	55,973	59,466	6.2
Cyclic Intermediates	45,487	50,193	10.3	19,585	22,333	14.0	6,337	7,150	12.8
Dyes	222	236	6.0	267	226	-15.6	651	652	0.2
Organic pigments	81	89	9.5	69	77	11.1	448	513	14.6
Medicinal chemicals	225	264	17.5	145	158	9.6	1,339	1,518	13.3
Flavor and perfume materials	152	138	-9.0	86	96	12.0	587	623	6.3
Plastics and resin materials	49,998	52,447	4.9	42,171	45,144	7.0	20,168	20,355	0.9
Rubber-processing chemicals	260	324	24.6	174	235	35.0	281	297	5.7
Elastomer (synthetic rubber)	3,828	4,081	6.6	2,228	2,489	11.7	2,054	2,213	7.7
Plasticizers	1,710	1,722	0.7	1,470	1,624	10.5	741	785	3.2
Surface-active agents ...	5,363	5,895	9.9	3,328	3,567	7.2	1,574	1,606	2.0

See footnotes at end of table.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 1—Continued

Synthetic organic chemicals and their raw materials U.S. production and sales, 1985 and 1986

<i>Chemical</i>	<i>Production</i>			<i>Sales</i>					
				<i>Quantity</i>			<i>Value</i>		
	<i>1985</i>	<i>1986</i>	<i>Increase or decrease (-), 1986 over 1985¹</i>	<i>1985</i>	<i>1986</i>	<i>Increase or decrease (-), 1986 over 1985¹</i>	<i>1985</i>	<i>1986</i>	<i>Increase or decrease (-), 1986 over 1985¹</i>
	<i>Million pounds</i>	<i>Million pounds</i>	<i>Percent</i>	<i>Million pounds</i>	<i>Million pounds</i>	<i>Percent</i>	<i>Million dollars</i>	<i>Million dollars</i>	<i>Percent</i>
Synthetic organic chemicals—Continued									
Pesticides and related products	1,235	1,180	-4.4	1,022	940	-8.0	4,437	4,234	-4.6
Miscellaneous end-use chemicals and chemical products	22,214	23,033	3.7	16,217	16,600	2.4	6,178	8,731	41.3
Miscellaneous cyclic and acyclic chemicals	93,927	95,666	1.9	36,431	37,930	4.1	11,179	10,809	-3.3

¹ Percentage calculated from figures rounded to thousands.

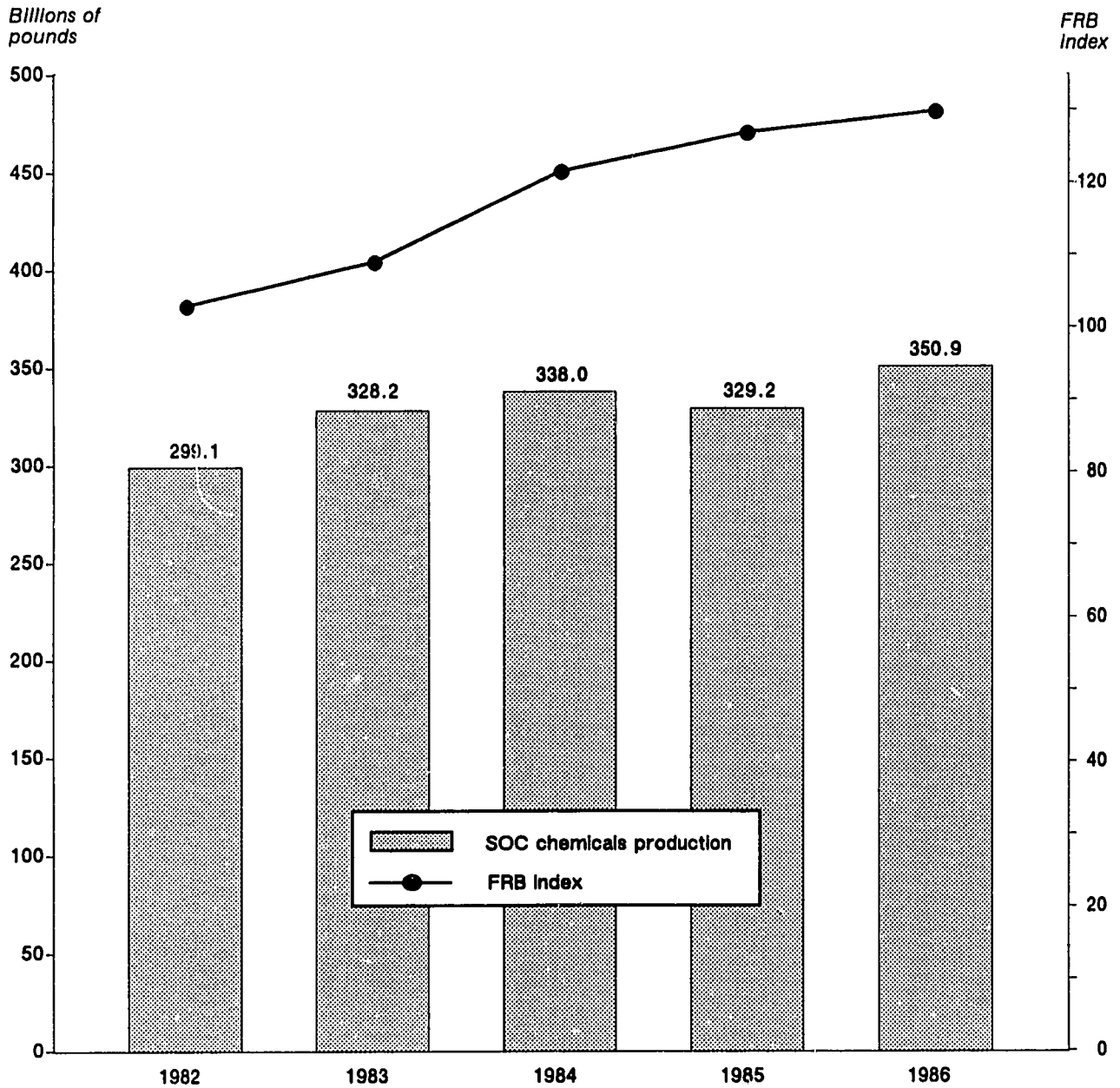
² Because of rounding, figures may not add to the totals shown.

³ Not available.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

SUMMARY

Figure 1
Synthetic organic chemicals and their raw materials, total, vs FRB Index



Source: Production, U.S. International Trade Commission, *Synthetic Organic Chemicals: United States Production and Sales*; FRB index, The Board of Governors of the Federal Reserve System.

SYNTHETIC ORGANIC CHEMICALS, 1986

GENERAL

In this report, synthetic organic chemicals are classified on the basis of their principal use as follows: Cyclic intermediates, dyes, organic pigments, medicinal chemicals, flavor and perfume materials, plastics and resin materials, rubber-processing chemicals, elastomers (synthetic rubber), plasticizers, surface-active agents, pesticides and related products, miscellaneous end-use chemicals and chemical products, and miscellaneous cyclic and acyclic chemicals. Most of these groups are further subdivided either by use or by chemical composition. As intermediates, chemicals are used in the manufacture of finished products, aggregate figures that cover both intermediates and finished products necessarily include considerable duplication.

Total production of synthetic organic chemicals (intermediates and finished products combined) in 1986 was 235,267 million pounds, or 4.7 percent more than the output of 224,702 million pounds reported for 1985, and 124.7 percent more than the output of 104,711 million pounds reported in 1967 (see table 2). Sales of synthetic organic chemicals in 1986 amounted to 131,419 million pounds, valued at \$59,466 million, compared with 123,193 million pounds, valued at \$55,973 million, in 1985, and 55,177 million pounds, valued at \$10,438 million, in 1967. Production of all cyclic products (intermediates and finished products combined) in 1986 totaled 77,674 million pounds, or 7.7 percent more than the 72,131 million pounds reported for 1985, and 149.1 percent more than the 31,182 million pounds reported for 1967; however, the transfer of eight items, in 1979, from the primary products from petroleum and natural gas section to the section on cyclic intermediates has caused the output of cyclic products to appear much higher in relation to 1967 than would otherwise have resulted. Production of all acyclic products in 1986 totaled 153,462 million pounds, or 3.2 percent more than the 148,743 million pounds reported for 1985, and 120.2 percent more than the 69,707 million pounds reported for 1967.

Table 2
Synthetic organic chemicals summary of U.S. production and sales of intermediates and finished products, 1967, 1985, and 1986

(Production and sales in thousands of pounds; sales value in thousands of dollars)

Chemical	1967 ¹	1985	Increase or decrease (-)		
			1986	1986 over 1967	1986 over 1985
Organic chemicals, cyclic and acyclic, grand total:					
Production	104,711,357	224,702,075	235,267,490	124.7	4.7
Sales	55,176,823	123,193,035	131,419,041	138.2	6.7
Sales value	10,438,453	55,972,673	59,465,667	469.7	6.2
Cyclic, total:²					
Production	31,181,832	72,130,700	77,674,272	149.1	7.7
Sales	17,388,529	39,408,923	43,071,693	147.7	9.3
Sales value	4,170,713	25,093,594	27,923,080	569.5	11.3
Acyclic, total:²					
Production	69,706,980	148,743,434	153,462,151	120.2	3.2
Sales	34,526,250	81,558,256	85,858,312	148.7	5.3
Sales value	5,393,503	28,825,019	29,329,973	443.8	1.8
1. Cyclic Intermediates					
Production	20,793,132	45,487,054	50,192,839	141.4	10.3
Sales	9,461,180	19,585,150	22,332,679	136.0	14.0
Sales value	1,000,359	6,336,524	7,150,386	614.8	12.8
2. Dyes					
Production	206,240	222,127	235,547	14.2	6.0
Sales	198,592	267,283	225,695	13.6	-15.6
Sales value	332,049	650,580	651,804	96.3	0.2
3. Organic Pigments					
Production	53,322	80,857	88,521	66.0	9.5
Sales	42,867	69,034	76,711	79.0	11.1
Sales value	108,354	447,704	513,132	373.6	14.6

See footnotes at end of table.

GENERAL

Table 2—Continued

Synthetic organic chemicals summary of U.S. production and sales of Intermediates and finished products, 1967, 1985, and 1986

(Production and sales in thousands of pounds; sales value in thousands of dollars)

Chemical	1967 ¹	1985	Increase or decrease (-)		
			1986	1986 over 1967	1986 over 1985
4. Medicinal Chemicals					
Cyclic:					
Production	110,129	175,931	207,619	88.5	18.0
Sales	70,120	100,923	106,195	51.4	5.2
Sales value	348,873	1,199,304	1,364,394	291.1	13.8
Acyclic:					
Production	69,941	48,729	56,442	-19.3	15.8
Sales	56,804	43,695	52,253	-8.0	19.6
Sales value	36,402	140,018	153,136	320.7	0.4
5. Flavors and Perfume Materials					
Cyclic:					
Production	57,978	101,217	84,818	46.3	-16.2
Sales	47,285	70,464	72,335	53.0	2.7
Sales value	52,866	546,937	566,944	972.0	3.7
Acyclic:					
Production	53,558	50,654	53,312	-0.5	5.2
Sales	49,311	15,611	24,108	-51.1	54.4
Sales value	40,495	39,623	56,502	39.5	42.6
6. Plastics and Resin Materials					
Cyclic:					
Production	5,033,497	14,849,367	15,576,662	209.5	4.9
Sales	4,224,121	12,313,993	13,182,073	212.1	7.0
Sales value	1,036,940	8,188,127	8,264,044	697.0	0.9
Acyclic:					
Production	8,759,452	35,148,502	36,870,013	320.9	4.9
Sales	7,753,242	29,857,216	31,982,014	312.2	7.0
Sales value	1,635,890	11,979,673	12,090,744	639.2	0.9
7. Rubber-Processing Chemicals					
Cyclic:					
Production	220,139	237,224	296,853	34.8	25.1
Sales	169,970	154,709	210,539	23.9	36.1
Sales value	116,318	258,438	273,380	135.0	5.8
Acyclic:					
Production	43,994	22,940	27,257	-38.0	18.8
Sales	30,878	19,564	24,727	-19.9	26.4
Sales value	15,477	22,242	23,170	49.7	4.2
8. Elastomers (Synthetic Rubber)					
Production	3,822,545	3,827,941	4,081,067	6.8	6.6
Sales	3,262,044	2,227,856	2,488,536	-23.7	11.7
Sales value	874,237	2,054,060	2,212,614	153.1	7.7
9. Plasticizers					
Cyclic:					
Production	929,871	1,285,753	1,312,105	41.1	2.1
Sales	865,084	1,118,334	1,245,349	44.0	11.4
Sales value	167,827	498,761	516,501	207.8	3.6
Acyclic:					
Production	332,908	424,106	410,021	23.2	-3.3
Sales	296,767	351,414	378,821	27.6	7.8
Sales value	93,142	242,586	248,286	166.6	2.3
10. Surface-Active Agents					
Cyclic: ^a					
Production	1,418,444	2,350,782	2,567,382	(⁴)	9.2
Sales	852,238	1,814,388	1,864,282	(⁴)	2.7
Sales value	95,810	565,176	567,806	(⁴)	0.5

See footnotes at end of table.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 2—Continued

Synthetic organic chemicals summary of U.S. production and sales of intermediates and finished products, 1967, 1985, and 1986

(Production and sales in thousands of pounds; sales value in thousands of dollars)

Chemical	1967 ¹	1985	1986	Increase or decrease (-)	
				1986 over 1967	1986 over 1985
10. Surface-Active Agents--Continued					
Acyclic:					
Production	2,060,851	3,012,401	3,327,999	(⁴)	10.5
Sales	897,786	1,513,440	1,702,727	(⁴)	12.5
Sales value	220,877	1,009,134	1,038,354	(⁴)	2.9
11. Pesticides and Related Products					
Cyclic:					
Production	823,158	876,212	862,184	4.7	-1.6
Sales	681,532	712,722	692,262	1.6	-2.9
Sales value	627,742	3,266,051	2,964,065	372.2	-9.2
Acyclic:					
Production	226,505	358,702	317,858	40.3	-11.4
Sales	215,831	308,993	248,076	14.9	-19.7
Sales value	159,301	1,170,784	1,269,605	697.0	8.4
12. Miscellaneous End-Use Chemicals and Chemical Product					
Cyclic:					
Production	(1,535,922)	3,772,190	3,534,252	(⁵)	-6.3
Sales	(775,540)	1,948,643	1,897,205	(⁵)	-2.6
Sales value	(283,575)	2,039,900	4,050,468	(⁵)	98.6
Acyclic:					
Production	(58,159,771)	18,442,061	19,499,122	(⁵)	5.5
Sales	(25,225,631)	14,268,507	14,702,583	(⁵)	3.0
Sales value	(3,192,119)	4,137,780	4,680,944	(⁵)	13.1
13. Miscellaneous Cyclic and Acyclic Chemicals					
Cyclic:					
Production	(⁵)	2,691,986	2,715,490	(⁵)	0.9
Sales	(⁵)	1,253,280	1,166,368	(⁵)	-6.9
Sales value	(⁵)	1,096,092	1,040,156	(⁵)	-5.1
Acyclic:					
Production	(⁵)	91,235,339	92,950,127	(⁵)	1.9
Sales	(⁵)	35,177,816	36,763,503	(⁵)	4.5
Sales value	(⁵)	10,083,179	9,769,232	(⁵)	-3.1

¹ Standard reference base period for Federal Government general-purpose index numbers.

² Does not include data for elastomers.

³ Includes ligninsulfonates.

⁴ The data for 1967 are not comparable with current data as a result of a change in accounting procedures.

⁵ Items in these two sections were previously included in the section named miscellaneous chemicals.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

The following tabulation shows, by chemical groups, the number of companies that reported production in 1986 of one or more of the chemicals included in the groups listed in table 2:

Chemical group	Number of companies	Chemical group	Number of companies
Cyclic intermediates	74	Elastomers (synthetic rubber)	28
Dyes	37	Plasticizers	44
Organic pigments	38	Surface-active agents	170
Medicinal chemicals	91	Pesticides and related products	75
Flavor and perfume materials	33	Miscellaneous end-use chemicals and	
Plastics and resins materials	262	chemicals products	158
Rubber-processing chemicals	25	Miscellaneous cyclic and acyclic	
		chemicals	275

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SYNTHETIC ORGANIC CHEMICALS, 1986

SECTION 1. COAL TAR AND TAR CRUDES

Cynthia B. Foreso

202-523-1230

Coal tar is produced chiefly by the steel industry as a byproduct of the manufacture of coke; water-gas tar and oil-gas tar are produced by the fuel-gas industry. Production of coal tar, therefore, depends on the demand for steel; production of water-gas tar and oil-gas tar reflects the consumption of manufactured gas for industrial and household use. Water-gas and oil-gas tars have properties intermediate between those of petroleum asphalts and coal tar. Petroleum asphalts are not usually considered to be raw materials for chemicals.

The U.S. International Trade Commission began collecting data on coal tar for the 1986 reporting year. In 1986, U.S. production of coal tar totaled 169 million gallons, and crude light oil amounted to 85 million gallons.

Tar crudes are obtained from coke-oven gas and by distilling coal tar, water-gas tar, and oil-gas tar. The most important tar crudes are benzene, toluene, xylene, creosote oil, and pitch of tar. Some of these products are identical with those obtained from petroleum. Data for materials obtained from petroleum are included, for the most part, with the statistics for like materials obtained from coke-oven gas and tars, and are shown in table 3 (see also figure 2).

The domestic production by coke-oven operators of industrial and specification grades of benzene, toluene, and xylene cannot be published since to do so would disclose the operations of individual companies. However, the 1986 benzene production by petroleum refiners amounted to 1.4 billion gallons. The output of toluene from petroleum refiners (including material used for blending in aviation fuel) and the refiners' output of xylene (including that produced for blending in motor fuels) was not publishable.

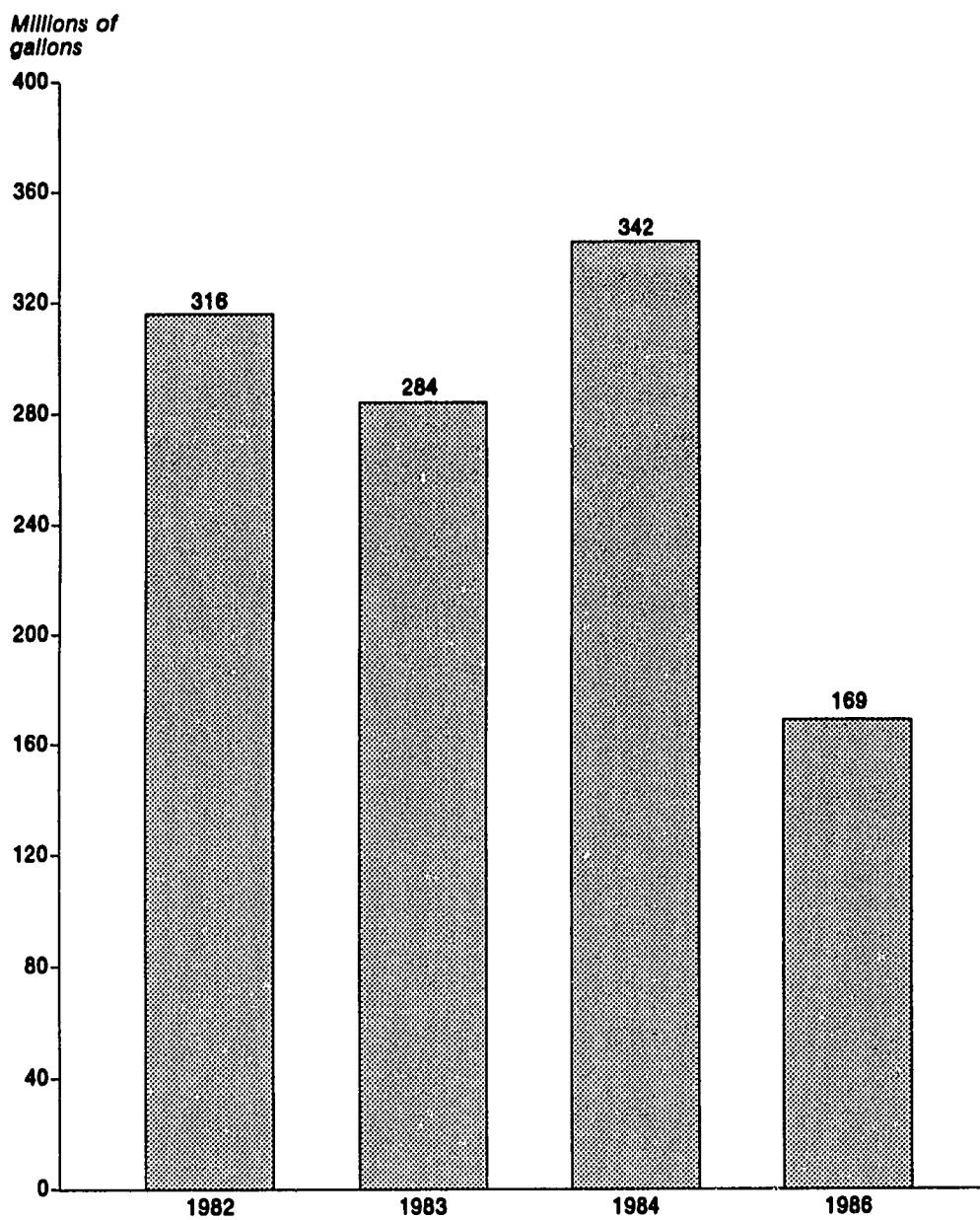
Some of the products obtained from tar and included in the statistics in table 3 are obtained from other products for which data are also included in the table. The statistics, therefore, involve considerable duplication, and for this reason no group totals or grand totals are given.

Table 4 lists the products reported in this section and indicates the manufacturer(s) of each by code. These codes are identified by company name in table 5.

Data for 1986 tar crudes were supplied by 30 companies and company divisions.

SECTION 1. TAR AND TAR CRUDES

Figure 2
Crude coal tar



Note.—Data for 1985 are not available.

Source: U.S. International Trade Commission, *Synthetic Organic Chemicals: United States Production and Sales*.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 3

Coal tar and tar crudes: U.S. production and sales, 1986

(Listed below are all tar crudes for which any reported data on production or sales may be published. Table 4 lists all products for which data on production and/or sales were reported and identifies the manufacturers of each)

Coal tar and tar crudes	Unit of Quantity	Production	Sales		Unit value ¹
			Quantity	Value	
			1,000 dollars		
Coal tar: Coke-oven operators	1,000 gal	168,583	136,388	61,406	\$0.45
Crude light oil: Coke-oven operators	1,000 gal	84,878	49,438	24,644	.50
Intermediate light oil: Coke-oven operators	1,000 gal	(²)	(²)	(²)	(²)
Light-oil distillates:					
Benzene, all grades, total ³	1,000 gal	(²)	(²)	(²)	(²)
Coke-oven operators	1,000 gal	(²)	(²)	(²)	(²)
Petroleum refiners ⁴	1,000 gal	1,361,540	(²)	(²)	(²)
Toluene, all grades, total	1,000 gal	(²)	(²)	(²)	(²)
Coke-oven operator	1,000 gal	(²)	(²)	(²)	(²)
Petroleum refiners	1,000 gal	(²)	(²)	(²)	(²)
Xylene, all grades, total ³	1,000 gal	(²)	(²)	(²)	(²)
Coke-oven operators	1,000 gal	(²)	(²)	(²)	(²)
Petroleum refiners	1,000 gal	(²)	353,388	275,362	.78
Crude tar acid oils with a tar acid content of 5 percent to less than 24 percent	1,000 gal	2,648	2,446	2,530	1.03
Creosote oil (Dead oil) (100% creosote basis):					
Distillate as such (100% creosote basis) ..	1,000 gal	46,848	31,508	27,596	.88
Creosote in coal tar solution (100% solution basis)	1,000 gal	31,645	36,603	29,681	.81

¹ Unit value per gallon, pound, or ton as specified.

² Statistics cannot be published; to do so would disclose the operations of individual companies.

³ Includes data for material produced for use in blending motor fuels. The annual production statistics for petroleum refiners on benzene, toluene, and xylene are not comparable with the combined monthly production figures because of fiscal year revisions.

⁴ Benzene, specification grades (1°, 2°).

Note.—Statistics for materials produced in tar and petroleum refineries are compiled by the U.S. International Trade Commission. Data for all other tars and tar crudes are not included in the 1986 report because publication would disclose the operations of individual companies.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

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SECTION 1. TAR AND TAR CRUDES

Table 4

Coal tar and tar crudes for which U.S. production and/or sales were reported, identified by manufacturer, 1986

(Chemicals for which separate statistics are given in table 3 are marked below with an asterisk (*); chemicals not so marked do not appear in table 3 because the reported data are accepted in confidence and may not be published. Manufacturers' identification codes shown below are taken from table 5. An "X" signifies that the manufacturer did not consent to his identification with the designated product)

<i>Coal tar and tar crudes</i>	<i>Manufacturers' identification codes (according to list in table 5)</i>
Light oil, light oil distillates, and tar bases:	
*Crude coal tar	ABP, ALS, CDT, CGU, DTR, EKO, GSS, ILI, INL, LTV, NBC, ROU, SGO, TWD, USS, WPS, X.
*Crude light oil	ABP, ALS, BTS, CGU, EKO, GSS, IGC, ILI, INL, LTV, NBC, NTS, ROU, SGO, TWD, USS, WPS, X.
Pyridine, tar bases:	
Benzene (Benzol):	
Tar bases: crude bases (Dry basis)	KPT, NTS, USS.
Benzene (Benzol) 90-100%	BTS, USS.
Toluene (Toluol):	
Tar bases: semrefined or denaturing grade	USS.
Toluene (Toluol) 90-100%	BTS, USS.
Xylene (Xylol):	
Xylene (Xylol): 90-100%	USS.
All other:	
All other light-oil distillates	BTS, USS.
Other tar distillates:	
Naphthalene, crude:	
Methylnaphthalene	KPT.
Naphthalene, crude, solidifying at less than 74°C	BTS, GSS, LTV.
Naphthalene, crude, solidifying at 76°C to less than 79°C	ACS, KPT.
Crude tar acid oils:	
*Crude tar acid oils having a tar acid content of 5 percent to less than 24 percent	ACS, INL, KPT.
Cresylic acid crude:	
Sodium cresylate	KPT.
Creosote oil (Dead oil):	
Creosote oil (Dead oil): creosote content in solution (100 Percent basis)	RIL.
*Creosote oil (Dead oil): creosote in coal tar solution (100 Percent solution basis)	ACS, KPT, RIL, USS.
*Creosote oil (Dead oil): distillate as such (100 percent creosote basis)	ACS, COP, KPT, RIL, USS.
All other distillate products:	
Carbon black oil	ACS, KPT.
Crude coal tar solvent	KPT.
Priming and refractory oil	BTS, KPT.
Sodium phenate or carbolate	NTS.
All other tar distillates	GIV, LYP.
Tar and tar pitches:	
Tar, road:	
Tar, road	ACS, RIL.
Tar for other uses:	
Tar for other uses: crude	BTS, IGC, USS.
Tar for other uses: refined	ACS, KPT, RIL.
Pitch of tar:	
Pitch of tar: hard (M.P. 161°F and Over)	ACS, KPT.
Pitch of tar: medium (M.P. 110° to 160°F)	COP, KPT, USS.
Pitch of tar: soft (M.P. 80° to 109°F)	USS.
All other:	
All other pitch of tar	WPS.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 5

Coal tar and tar crudes: Alphabetical directory of manufacturers, by code, 1986

(Names of manufacturers that reported production and/or sales of tar and tar crudes to the U.S. International Trade Commission for 1986 are listed below in the order of their identification codes as used in table 4)

<i>Code</i>	<i>Name of company</i>	<i>Code</i>	<i>Name of company</i>
ABP	Drummond Co., Inc.	KPT	Koppers Co., Inc.
ACS	Allied Signal, Inc., Engineered Materials Sector	LTV	LTV Steel Co.
ALS	Armco, Inc.	LYP	Lyondell Petrochemical Co.
BTS	Bethlehem Steel Corp.	NBC	New Boston Coke Corp.
CDT	Carondelet Coke Corp.	NTS	National Steel Corp., Great Lakes Plant
CGU	Citizen Gas and Coke Utility	RIL	Rilly Tar & Chemical Corp.
COP	Coopers Creek Chemical Corp.	ROU	Rouge Steel Co.
DTR	Detroit Coke Corp.	SGO	Shenango, Inc.
EKO	Empire Coke Co.	TWO	Tonawanda Coke Corp.
GIV	Givaudan Corp.	USS	U.S. Steel Corp.: Clairton Plant Gary Works Geneva Plant USS Chemicals Div.
GSS	Gulf States Steel		
IGC	Indiana Gas & Chemical Corp.	WPS	Wheeling-Pittsburgh Steel Corp.
ILI	Acme Steel Corp.	WTC	Witco Chemical Corp.
INL	Inland Steel Co.		

Note.—Complete names, telephone numbers, and addresses of the above reporting companies are listed in app. A.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

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SYNTHETIC ORGANIC CHEMICALS, 1986

SECTION 2. PRIMARY PRODUCTS FROM PETROLEUM AND NATURAL GAS FOR CHEMICAL CONVERSION

James Raftery

202-523-0453

Primary products that are derived from petroleum and natural gas are related to the intermediates and finished products made from such primary materials in much the same way that crude products derived from the distillation of coal tar¹ are related to their intermediates and finished products. Many of the primary products derived from petroleum are identical with those derived from coal tar (e.g., benzene, toluene, and xylene). Considerable duplication exists in the statistics on the production and sales of primary petroleum products because some of these primary chemicals are converted to other primary products derived from petroleum and because data on some production and sales are reported at successive stages in the conversion process. The statistics are sufficiently accurate, however, to indicate trends in the industry. Many of the primary products for which data are included in the statistics may be used either as fuel or as basic materials from which other chemicals are derived. In this report every effort has been made to exclude data on materials that are used as fuel; however, data are included on toluene and xylene, which are used in blending aviation and motor fuel.

The total production of primary products derived from petroleum and natural gas during 1982-86 is shown in figure 3. Production increased 16,618 million pounds or by 18 percent from 1982-83 as a result of economic conditions. Between 1983-86 production increased 3.5 percent from 109,670 million pounds to 113,545 million pounds.

The output of primary products derived from petroleum and natural gas as a group amounted to 113,545 million pounds in 1986. Production in 1985 was 104,484 million pounds. The output of aromatic and naphthenic products from petroleum amounted to 24,836 million pounds in 1986, compared with 23,453 million pounds in 1985. Sales amounted to \$1,404 million in 1986 and \$1,973 million in 1985. In 1986, production of benzene was 9,966 million pounds; production of high purity toluene was 4,408 million pounds; and production of high purity mixed xylenes was 4,735 million pounds (table 6).

Production of all aliphatic hydrocarbons and derivatives from petroleum and natural gas was 88,710 million pounds in 1986, compared with 81,031 million pounds in 1985. Sales of these products were valued at \$4,616 million in 1986, compared with \$5,837 million in 1985. Production of ethylene was 32,859 million pounds in 1986. The output of 1,3-butadiene in 1986 was 2,546 million pounds. Production of propylene in 1986 was 16,522 million pounds (table 6).

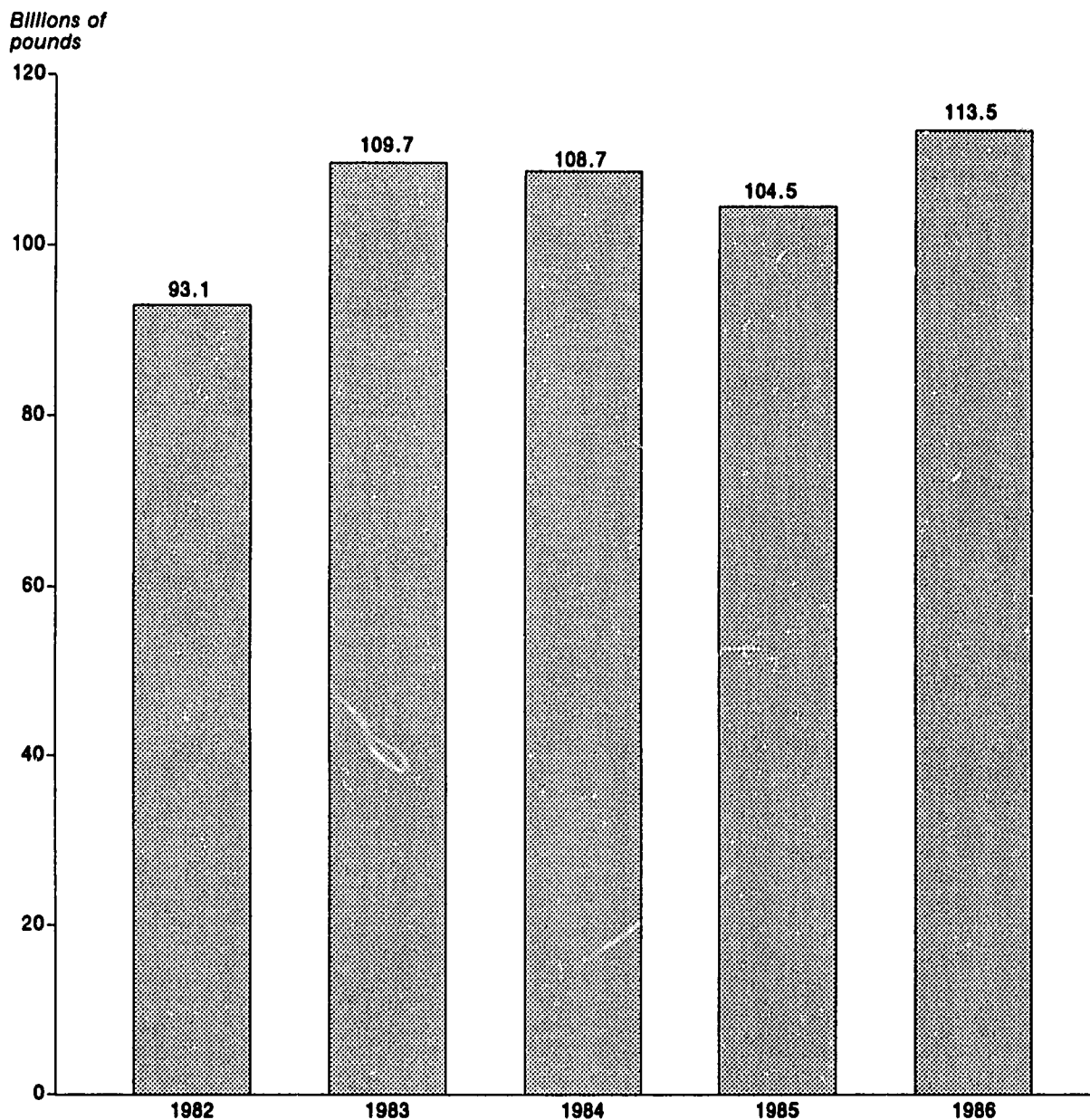
Table 7 lists the products reported in this section and indicates the manufacturer of each by code. The codes are identified by company name in table 8.

Data for 1986 primary products from petroleum and natural gas for chemical conversion were supplied by 64 companies or company divisions.

¹ Statistics on chemicals from coal tar are given in Section 1 (Coal Tar and Tar Crudes) of this report.

SECTION 2. PRIMARY PRODUCTS FROM PETROLEUM AND NATURAL GAS FOR CHEMICAL CONVERSION

Figure 3
Primary products from petroleum and natural gas



Source: U.S. International Trade Commission, *Synthetic Organic Chemicals: United States Production and Sales*.

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SYNTHETIC ORGANIC CHEMICALS, 1986

Table 6

**Primary products from petroleum and natural gas for chemical conversion:
U.S. production and sales, 1986**

(Listed below are the primary products from petroleum and natural gas for chemical conversion for which any reported data on production or sales may be published. (Leaders (...)) are used where the reported data are accepted in confidence and may not be published or where no data were reported.) Table 7 lists all primary products from petroleum and natural gas for chemical conversion for which data on production and/or sales were reported and identifies the manufacturers of each)

Primary products from petroleum and natural gas for chemical conversion	Sales			Unit value ¹
	Production	Quantity	Value	
	1,000 pounds	1,000 pounds	1,000 dollars	Per pound
Grand total	113,545,425	53,035,394	6,020,068	\$0.11
Aromatics and naphthenes²				
Total	24,835,730	14,332,865	1,404,315	.10
Benzene, all grades, total	9,966,472	...	...	...
High purity (98-100%)	8,860,422	3,939,318	454,868	.12
Other (90-97.9%)	1,106,050	...	...	...
Toluene, all grades, total .....	...	...	...	...
High purity (98-100%)	4,407,934	3,553,747	364,449	.10
Other (90-97.9%) ^{3 4} .....	...	...	...	...
Xylene, mixed, total .....	...	2,685,748	275,362	.10
High purity (98-100%)	4,734,685	2,554,545	261,464	.10
Other (90-97.9%) .....	...	131,203	13,698	.11
All other aromatics and naphthenes⁵	5,728,639	4,154,052	309,636	.07
Aliphatic hydrocarbons				
Total	88,709,695	38,702,529	4,615,753	.12
C₂ Hydrocarbons, total	39,607,749	13,006,804	1,591,280	.12
Acetylene ⁶ (For chemical use only)	259,739	107,108	38,050	.36
Ethane	6,489,282	2,721,063	147,009	.05
Ethylene	32,858,728	10,178,633	1,406,221	.14
C₃ Hydrocarbons, total	25,073,942	14,266,487	1,269,732	.09
Propane	8,551,715	6,605,439	431,278	.07
Propylene ⁷	16,522,227	7,661,048	838,454	.11
C₄ Hydrocarbons, total	14,049,883	6,356,395	789,363	.12
Butadiene and butylene fractions	1,581,897	1,297,811	110,179	.08
1,3-Butadiene, grade for rubber (elastomers) ...	2,546,304	2,488,813	419,904	.17
n-Butane	1,939,845	1,134,827	79,160	.07
1-Butene	441,473	228,932	44,608	.19
1-Butene and 2-Butene mixed ⁸ .....	...	66,837	7,101	.11
isobutane	1,131,099	520,819	38,249	.07
isobutylene	1,124,289	257,203	56,150	.22
All other C ₄ hydrocarbons ⁹	5,284,978	361,553	34,012	.09
C₅ Hydrocarbons, total	2,467,641	824,542	90,180	.11
isoprene (2-Methyl-1,3-butadiene)	139,489	98,195	15,436	.16
n-Pentane	73,858	...	...	...
Pentenes, mixed .....	...	434,719	38,402	.09
Piperylene (1,3-Pentadiene)	87,787	83,247	10,963	.13
All other C ₅ hydrocarbons ^{10 11}	2,166,507	208,381	25,379	.12

See footnotes at end of table.

SECTION 2. PRIMARY PRODUCTS FROM PETROLEUM AND NATURAL GAS FOR CHEMICAL CONVERSION

Table 6—Continued

**Primary products from petroleum and natural gas for chemical conversion:
U.S. production and sales, 1986**

<i>Primary products from petroleum and natural gas for chemical conversion</i>	<i>Sales</i>			
	<i>Production</i>	<i>Quantity</i>	<i>Value</i>	<i>Unit value¹</i>
	<i>1,000 pounds</i>	<i>1,000 pounds</i>	<i>1,000 dollars</i>	<i>Per pound</i>
Allphatic hydrocarbons—Continued				
All other allphatic hydrocarbons, derivatives and mixtures, total	7,510,480	4,248,301	875,198	\$0.21
Alpha olefins, C ₈ -C ₁₀	702,591	444,495	135,256	.30
Alpha olefins, C ₁₁ and higher	700,382	403,245	101,012	.25
Dodecene (Tetrapropylene)	389,287	231,207	42,180	.18
n-Heptane	131,311	121,890	22,488	.18
Hexane	379,247	309,399	49,164	.16
Nonene (Tripropylene)	535,263	318,298	55,397	.17
n-Paraffins ¹²	2,032,816	1,375,909	216,939	.16
All other ¹³	2,639,583	1,043,858	252,762	.24

¹ Calculated from rounded figures.

² The chemical raw materials designated as aromatics are in some cases identical with those obtained from the distillation of coal tar; however, the statistics given in the table above relate only to such materials as are derived from petroleum and natural gas. Statistics on production and/or sales of benzene, toluene, and xylene from all sources are given in table 1 of the report on "Tar and Tar Crudes."

³ Includes toluene, solvent grade, 90 percent.

⁴ Includes toluene and xylene used as solvents; may include that which is blended in aviation and motor gasolines.

⁵ Includes data for alkyl aromatics, crude cresylic acid, cyclopentane, naphthalene, naphthenic acid, carbon black feedstock, distillates, solvents and miscellaneous cyclic hydrocarbons. Also includes production and/or sales data for the other than high purity grades of benzene, toluene, and mixed xylenes.

⁶ Production figures on acetylene from calcium carbide for chemical synthesis are collected by the U.S. Bureau of the Census.

⁷ Includes data for refinery propylene.

⁸ The statistics represent principally the butene content of crude refinery gases from which butadiene is manufactured.

⁹ Includes production and/or sales data for mixed C₄ streams, and 2-butene. Includes production data only for mixtures of 1-butene and 2-butene.

¹⁰ Includes data for mixtures of C₅ hydrocarbons, isopentane, 1-pentene, and 2-pentene.

¹¹ Includes sales data only for n-pentane and production data only for mixed pentenes.

¹² Includes data for the following chain lengths: C₈-C₉, C₉-C₁₀, C₁₀-C₁₄, C₁₀-C₁₈, C₁₂-C₁₈ and others.

¹³ Includes production and/or sales data for methane, methylcyclopentadiene, isoheptanes, isohexane, iso-octane, mixed hexenes, mixed heptenes, mixed octenes, n-octane, di-isobutylene, eicosane, mixtures of C₂ and C₃, C₅-C₆, C₆-C₇, C₈-C₇ hydrocarbons, hydrocarbon derivatives, and other hydrocarbons.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 7

Primary products from petroleum and natural gas for chemical conversion for which U.S. production and/or sales were reported, identified by manufacturer, 1986

(Chemicals for which separate statistics are given in table 6 are marked below with an asterisk (*); chemicals not so marked do not appear in table 6 because the reported data are accepted in confidence and may not be published. Manufacturers' identification codes shown below are taken from table 8.)

<i>Primary products from petroleum and natural gas for chemical conversion</i>	<i>Manufacturers' identification codes (according to list in table 8)</i>
Aromatics and naphthenes	
Alkyl aromatics:	
Cyclosols	CXI.
All other alkyl aromatics	SHC.
*Benzene:	
*Benzene, high purity (98-100%)	AMO, CRP CSD, DOW, ENJ, GRS, HES, LYP, MOC, PLC, PPR, SHC, SIO, SM, SOC, SOG, SUN, SWR, TOC, TX, UOC, USI.
*Benzene, other	AMO, DUP, KHI, KLM, UTP, VST.
Cresylic acid (Less than 75 percent distilling over 215°C) .	KHI, PSG.
Cyclopentane	PLC.
Naphthalene	CXI, TX.
Naphthenic acid:	
Naphthenic acid, acid number 150-199	CPS, HEC, MER, PSG.
Naphthenic acid, acid number 200-224	MER, PSG.
Naphthenic acid, acid number 225-249	PSG.
Naphthenic acid, acid number less than 150	ATR, HEC, SHC.
Toluene:	
*Toluene, high purity (98-100%)	ASH, CSD, DOW, ENJ, GRS, HES, HST, KHI, LYP, MOC, MON, PLC, PPR, SHC, SIO, SM, SOG, SUN, SWR, TOC, TX, UCC, UOC.
Toluene, other	DUP, ELP, SHC, SOC.
Xylenes, mixed:	
*Xylene, high purity (98-100%)	AMO, ASH, CSD, ENJ, HES, PLC, PPR, SHC, SUN, SWR, UOC.
Xylene, other	AMO, MOC, SOG, TOC.
*All other aromatics and naphthenes:	
Aromatics, C ₈	MOC.
Carbon black feedstock	ENJ.
All other products from petroleum and natural gas, cyclic	AMO, ASH, BAS, BFG, EKX, ELP, ENJ, KHI, LYP, NWP, SHC, SWR, TX, UCC, VST.
Alliphatic hydrocarbons	
C₁ Hydrocarbons:	
Methane	NWP, SHO.
*C₂ Hydrocarbons:	
*Acetylene (For chemical use only)	BOR, RH, UCC.
*Ethane	AMO, ENJ, OMC, PLC, SHO, USI, UTP.
*Ethylene	AMO, BAS, BFG, CRP, DOW, DUP, EKX, ELP, ENJ, LYP, MCB, NWP, OMC, PLC, SHC, SM, SNO, SOC, TX, UCC, USI, USS, UTP, VST.
C₃ Hydrocarbons:	
Hydrocarbons, C₂-C₃, mixtures	
*Propane (Commercial and hd-5)	ASH, TU.
	AMO, ASH, BAS, CCP, CGO, CSD, CSP, ENJ, EPC, GRS, KHI, MOC, OMC, PLC, SHO, SM, SOG, SUN, TCR, TUS, UOC, USI.
*Propylene	AMO, BFG, CCP, CGO, CRP, CSD, DOW, DUP, EKX, ELP, ENJ, EPC, KHI, LYP, MCB, MOC, NWP, PLC, SHC, SIO, SM, SOC, SOG, SUN, TCR, TX, UCC, USS, UTP, VST.
*C₄ Hydrocarbons:	
*Butadiene and butylene fractions	
*1,3-Butadiene, grade for rubber (Elastomers)	BAS, CRP, DOW, EKX, ELP, NWP, PLC, SOC, TUS, UCC, UTP, VST.
	AMO, CRP, DOW, DUP, ELP, ENJ, LYP, SHC, SM, TPC, TUS.
*n-Butane	AMO, ASH, CSD, CSP, EPC, KHI, OMC, PLC, SHO, SUN, TNA, TUS, USI.
*1-Butene	ENJ, PLC, SHC, SOC, TNA, TPC.
2-Butene	PLC, TPC.
*1-Butene and 2-butene, mixed	DOW, LYP, SHC, SM, TNA.

SECTION 2. PRIMARY PRODUCTS FROM PETROLEUM AND NATURAL GAS FOR CHEMICAL CONVERSION

Table 7—Continued

Primary products from petroleum and natural gas for chemical conversion for which U.S. production and/or sales were reported, identified by manufacturer, 1986

Primary products from petroleum and natural gas for chemical conversion	Manufacturers' identification codes (according to list in table 8)
Aliphatic hydrocarbons—Continued	
*C₄ Hydrocarbons—Continued:	
Hydrocarbons, C ₄ , fraction	KHI, TX, USS.
Hydrocarbons, C ₄ , mixtures	EPC, KHI, MCB, PPR, SOG.
*Isobutane (2-Methylpropane)	AMO, CSP, ENJ, EPC, KHI, OMC, PLC, SHO, SUN, TUS, USI.
*Isobutylene (2-Methylpropene)	AMO, ATR, ENJ, SHC, TPC, TUS.
All other hydrocarbons, C ₄	LYP, SM, TX, USI, USS.
*C₅ Hydrocarbons:	
Hydrocarbons, C ₅ mixtures	LYP.
Isoamylene	ENJ.
Isopentane (2-Methylbutane)	PLC, SHO.
*Isoprene (2-Methyl-1,3-butadiene)	DOW, ENJ, LYP, SHO, SOC.
*n-Pentane	ASH, PLC, SHO.
2-Pentene	BFG, DOW.
*Pentenes, mixed	CSP, CXI, PLC, SHC, SHO, TUS, USS.
*Piperylene (1,3-Pentadiene)	CXI, DOW, LYP.
All other hydrocarbons, C ₅	ENJ, TX.
*All other aliphatic hydrocarbons, derivatives, and mixtures:	
C₆ Hydrocarbons:	
Di-isopropane (2,3-Dimethylbutane)	PLC.
*Hexane	ASH, ENJ, HMY, PLC, SHO, SOG, TX, UOC.
Hexenes, mixed	ENJ.
Hydrocarbons, C ₆ -C ₈ , mixtures	PLC.
Hydrocarbons, C ₆ -C ₇ , mixtures	ENJ.
Isohexane	PLC.
Methylcyclopentadiene	ENJ.
Neohexane (2,2-Dimethylbutane)	PLC.
All other hydrocarbons, C ₆	PLC, SHC, SM, TX.
C₇ Hydrocarbons:	
*n-Heptane	ENJ, PLC, SOG, TX, UOC.
Heptenes, mixed	ENJ, TX.
Hydrocarbons, C ₆ -C ₇ , mixtures	PPR, TX.
Isheptanes	PLC.
All other hydrocarbons, C ₇	EKX, PPR.
C₈ Hydrocarbons:	
Di-isobutylene (Di-isobutene)	EKT, TPC.
n-Octane	SOC.
Octenes, mixed	ENJ, TX.
2,2,4-Trimethylpentane (iso-octane)	PLC.
All other hydrocarbons, C ₈	SHC.
C₉ and above Hydrocarbons (except alpha olefins):	
*Dodecene	ATR, ENJ, SOC, SUN, UOC.
Eicosane	HMY.
*Nonene (Tripropylene)	ATR, CSP, ENJ, TX, UOC.
Hydrocarbons, C ₉ -C ₉ , mixtures	ELP.
Alpha olefins:	
*Alpha olefins, C ₉ -C ₁₀	PLC, SHC, SOC, TNA, USI.
*Alpha olefins, C ₁₁ and higher	SHC, SOC, TNA.
*N-Paraffins—Carbon chain length:	
n-Paraffins, C ₁₀ -C ₁₄	ENJ, SHC, UOC.
n-Paraffins, C ₁₀ -C ₁₆	VST.
n-Paraffins, C ₁₂ -C ₁₆	VST.
n-Paraffins, C ₈ -C ₉	SOG, UOC.
n-Paraffins, C ₉ -C ₁₅	SHC, SOG, TX, UOC.
All other n-paraffins	ENJ, SOC, UOC.
Polybutene	AMO, SOC.
Hydrocarbon derivatives:	
n-Butyl mercaptan (1-Butanethiol)	PAS, PLC.
sec-Butyl mercaptan (2-Butanethiol)	HAP, PLC.
tert-Butyl mercaptan (2-Methyl-2-propanethiol)	HAP, PAS.
Diethyl sulfide (Ethyl sulfide)	HAP, PAS.
Dimethyl sulfide	PAS.
Ethyl mercaptan (Ethanethiol)	HAP, PAS.
Ethylthioethanol	HAP.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 7—Continued

Primary products from petroleum and natural gas for chemical conversion for which U.S. production and/or sales were reported, identified by manufacturer, 1986

<i>Primary products from petroleum and natural gas for chemical conversion</i>	<i>Manufacturers' identification codes (according to list in table 8)</i>
Aliphatic hydrocarbons—Continued	
Hydrocarbon derivatives—Continued:	
isopropyl mercaptan (2-Propanethiol)	HAP, PAS, PLC.
Methyl ethyl sulfide	HAP, PAS.
Methyl mercaptan (Methanethiol)	PAS.
Octyl mercaptans	PAS.
n-Propyl mercaptan (1-Propanethiol)	PAS, PLC.
Thiophane (Tetrahydrothiophene)	HAP.
All other hydrocarbon derivatives	PAS, PLC.
All other hydrocarbons, C ₉ and above, including mixtures	CXI, NES, PLC, SHC, TNA.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

SECTION 2. PRIMARY PRODUCTS FROM PETROLEUM AND NATURAL GAS FOR CHEMICAL CONVERSION

Table 8

Primary products from petroleum and natural gas for chemical conversion alphabetical directory of manufacturers by code, 1986

(Names of manufacturers that reported production and/or sales of crude products from petroleum and natural gas for chemical conversion to the U.S. International Trade Commission for 1986 are listed below in the order of their identification codes as used in table 7)

<i>Code</i>	<i>Name of company</i>	<i>Code</i>	<i>Name of company</i>
AMO	Amoco Corp.	MCB	Borg-Warner Corp., Borg-Warner Chemicals
ASH	Ashland Oil, Inc., Ashland Petroleum Co.	MER	Merichem Co.
ATR	Atlantic Richfield Co., Arco Chemical Co.	MOC	Marathon Petroleum Co., Texas Refining Div.
BAS	BASF Corp.	MON	Monsanto Co.
BFG	B. F. Goodrich Co., B. F. Goodrich Chemical Group	NES	Ruetgers Nease Chemical Co.
BOR	Borden, Inc., Borden Chemical Div.	NWP	USI Chemicals Co., Inc.
CCP	Crown Central Petroleum Corp.	OMC	Olin Corp.
CGO	Citgo Petroleum Corp.	PAS	Pennwalt Corp.
CPS	CPS Chemical Co., Inc.	PLC	Phillips Petroleum Co.
CRP	Corpus Christi Petrochemical Co.	PPR	Phillips Puerto Rico Core, Inc.
CSD	Fina Oil & Chemical Co., Cosden Chemical Div.	PSG	PMC Specialties Group Inc.
CSP	Coastal Refining & Marketing, Inc.	RH	Rohm & Haas Co.
CXI	Chemical Exchange Industries, Inc.	SHC	Shell Oil Co., Shell Chemical Co. Div.
DOW	Dow Chemical Co.	SHO	Shell Oil Co.
DUP	E. I. duPont de Nemours & Co., Inc. Petrochemicals Dept.	SIO	Standard Oil Co. (Ohio)
	Eastman Kodak Co.:	SM	Mobil Oil Corp.: Gas Liquids Dept. Mobil Chemical Co., Petrochemicals Div.
EKT	Tennessee Eastman Co. Div.	SNO	SunOlin Chemical Co.
EKX	Texas Eastman Co. Div.	SOC	Chevron Corp., Chevron Chemical Co.
ELP	El Paso Products Co.	SOG	Hill Petroleum Company
ENJ	Exxon Chemical Americas	SUN	Sun Company, Inc.
EPC	Enterprise Products Co. of Mississippi	SWR	Southwestern Refining Co., Inc.
FER	Ferro Corp., Productol Chemical Div.	TCR	Texas City Refining, Inc.
GRS	Champlin Petroleum Co.	TNA	Ethyl Corp.
HAP	Helmerich & Payne, Inc., National Gas Odorizing Div.	TOC	Tenneco Oil Co.
HEC	Hewchem	TPC	Texas Petrochemicals Corp.
HES	Amerada Hess Corp. (Hess Oil Virgin Islands Corp.)	TU	Tenn-USS Chemicals Co.
HMY	Humphrey Chemical Co.	TUS	Texaco Butadiene Co.
HST	American Hoechst Corp., Petrochemical/Plastics Group	TX	Texaco, Inc., Texaco Chemical Co.
KHI	Koch Refining Co.	UCC	Union Carbide Corp.
KLM	Kalama Chemical, Inc.	UOC	Union Oil Co. of California
LYP	Lyondell Petrochemical Co.	USI	National Distillers & Chemicals Corp., U.S. Industrial Chemicals Co.
		USS	U.S. Steel Corp., USS Chemicals Div.
		UPT	Union Texas Petroleum
		VST	Vista Chemical Co.

Note.—Complete names, telephone numbers, and addresses of the above reporting companies are listed in app. A.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

SYNTHETIC ORGANIC CHEMICALS, 1986

SECTION 3. CYCLIC INTERMEDIATES

Ed Matusik

202-523-0492

Cyclic intermediates are synthetic organic chemicals derived principally from petroleum and natural gas and from coal-tar crudes produced by destructive distillation (pyrolysis) of coal. Most cyclic intermediates are used in the manufacture of more advanced synthetic organic chemicals and finished products, such as dyes, medicinal chemicals, elastomers (synthetic rubber), pesticides, and plastics and resin materials. Some intermediates, however, are sold as end products without further processing. For example, refined naphthalene may be used as a raw material in the manufacture of 2-naphthol or of other more advanced intermediates, or may be packaged and sold as a moth repellent or as a deodorant. In 1986, about 45 percent of the total output of cyclic intermediates was sold; the rest was consumed chiefly in the producing plants in the manufacture of more advanced intermediates and finished products.

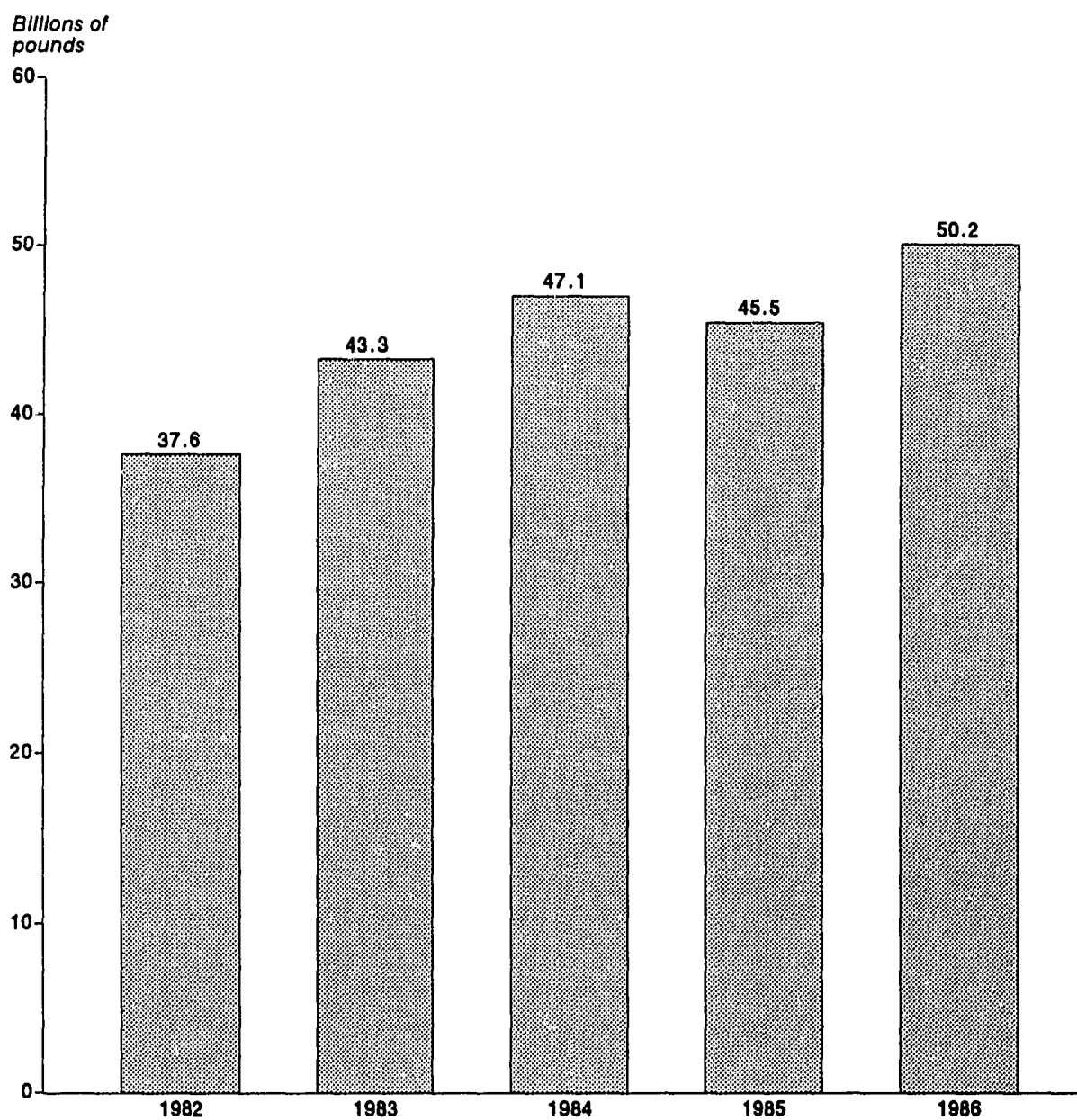
The total annual production of cyclic intermediates during 1982-86 is shown in figure 4. Total production of cyclic intermediates in 1986 amounted to 50,193 million pounds, an increase of 10 percent compared with production reported to the Commission in 1985 (table 9). Reported sales of cyclic intermediate chemicals in 1986 were 22,333 pounds, valued at \$7,150 million compared with 19,585 million pounds, valued at \$6,337 million, in 1985.

Intermediates that were produced in excess of 1 billion pounds in 1986 were ethylbenzene (9,020 million pounds), styrene (7,888 million pounds), terephthalic acid and terephthalic acid dimethyl ester (6,257 million pounds), p-xylene (5,035 million pounds), cumene (3,745 million pounds), phenol (3,115 million pounds), and cyclohexane (2,070 million pounds). These intermediate chemicals produced in excess of 1 billion pounds accounted for about 80 percent of the total output of cyclic intermediate chemicals produced in 1986.

Table 10 lists the products reported in this section and indicates the manufacturer(s) of each by code. These codes are identified by company name in table 11.

SECTION 3. CYCLIC INTERMEDIATES

Figure 4
Cyclic Intermediates



Source: U.S. International Trade Commission, *Synthetic Organic Chemicals: United States Production and Sales*.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 9

Cyclic Intermediates: U.S. production and sales, 1986

(Listed below are the primary products from petroleum and natural gas for chemical conversion for which any reported data on production or sales may be published. (Leaders (...)) are used where the reported data are accepted in confidence and may not be published or where no data were reported.) Table 10 lists all primary products from petroleum and natural gas for chemical conversion for which data on production and/or sales were reported and identifies the manufacturer of each)

Cyclic Intermediates	Sales			Unit value ¹
	Production	Quantity	Value	
	1,000 pounds	1,000 pounds	1,000 dollars	
Grand total	50,192,839	22,332,679	7,150,386	\$0.32
Acetoacetanilide	16,404	11,034	11,400	1.03
o-Acetoacetanilide	418	510	1,086	2.13
o-Acetoacetotoluidide	2,104	2,100	2,863	1.36
Alkylbenzenes ²	851,581	756,058	286,506	.38
4-Amino-5-methoxy-2-methylbenzenesulfonic acid (5-Methyl-o-anisidinesulfonic acid)	1,679	...	...	...
p-[(p-Aminophenyl)azo]benzenesulfonic acid	240	...	...	...
Aniline (Aniline oil)	823,892	412,899	100,105	.24
Anilinomethanesulfonic acid and salt	378	...	...	...
Benzoic acid, tech	73,300	...	...	...
Biphenyl	51,266	...	...	...
Butylphenols, mixed	2,381	...	...	...
Chlorobenzene, mono-	222,526	75,645	22,108	.29
Cresols and cresylic acid, total ³	57,299	56,596	35,591	.63
o-Cresol	19,324	20,514	11,061	.54
All other cresols and cresylic acid ⁴	37,975	36,082	24,530	.68
Cumene	3,744,917	2,120,858	313,146	.15
Cyclohexane	2,070,483	1,694,488	255,473	.15
Cyclohexanone	890,142	71,936	27,285	.38
o-Dichlorobenzene	41,080	49,015	19,663	.40
p-Dichlorobenzene	81,595	72,234	29,432	.41
Dicyclopentadiene (including cyclopentadiene)	98,946	83,528	18,375	.22
N,N-Dimethylbenzylamine	158	177	409	2.32
p-Dodecylphenol	14,219	...	...	...
Ethylbenzene	9,020,112	...	...	...
Isobutylbenzene	17,626	...	...	...
Isocyanic acid derivatives, total	1,477,647	1,359,240	1,067,491	.79
Polymethylene polyphenylisocyanate	453,267	436,554	316,589	.73
Toluene-2,4- and 2,6-diisocyanate (80/20 mixture)	664,890	637,010	510,202	.80
All other isocyanic acid derivatives	359,490	285,676	240,700	.84
4,4'-Isopropylidenediphenol (Bisphenol A)	956,213	340,575	146,988	.43
ar-Methylstyrene (Vinyltoluene)	36,948	...	...	...
Nitrobenzene	957,849	...	...	...
Nonylphenol	211,135	75,702	27,309	.36
Phenol, total ⁵	3,114,550	1,544,158	292,376	.19
From cumene	2,959,835	1,400,053	264,529	.19
All other phenol	154,715	144,105	27,847	.19
Phthalic anhydride	863,123	547,994	124,794	.23
Salicylic acid, tech	30,763	...	...	...
Styrene	7,887,505	3,575,918	661,912	.19
Terephthalic acid, dimethyl ester ⁶	6,257,384	...	...	...
Tetrahydrofuran	121,958	47,958	43,004	.90
o-Xylene	787,706	535,966	70,389	.13

SECTION 3. CYCLIC INTERMEDIATES

Table 9 —Continued
Cyclic intermediates: U.S. production and sales, 1986

<i>Cyclic Intermediates</i>	<i>Production</i>	<i>Sales</i>		
		<i>Quantity</i>	<i>Value</i>	<i>Unit value¹</i>
	<i>1,000 pounds</i>	<i>1,000 pounds</i>	<i>1,000 dollars</i>	<i>Per pound</i>
p-Xylene	5,034,736	3,207,726	609,404	\$.019
All other cyclic intermediates	4,370,476	5,690,364	2,983,277	.52

¹ Calculated from unrounded figures.

² Includes straight-chain dodecylbenzene, tridecylbenzene, and other straight-chain alkylbenzenes. Branched-chain alkylbenzenes are included in "All other cyclic intermediates."

³ Does not include data for coke oven and gas-retort ovens.

⁴ Figures include (o,m,p)-cresol from coal tar, m-cresol, p-cresol, cresylic acid refined from petroleum and coal tar, and (m,p)-cresol from petroleum.

⁵ The figure for terephthalic acid, dimethyl ester (DMT) includes both the acid itself and the dimethyl ester without double counting. The acid production figure was multiplied by the factor 1.18 to convert it to equivalent DMT.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 10

Cyclic Intermediates for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1986

(Chemicals for which separate statistics are given in table 9 are marked below with an asterisk (*); chemicals not so marked do not appear in table 9 because the reported data are accepted in confidence and may not be published. Manufacturers' identification codes shown below are taken from table 11. An "X" signifies that the manufacturer did not consent to his identification with the designated product)

<i>Cyclic Intermediates</i>	<i>Manufacturers' identification codes (according to list in table 11)</i>
Cyclic	
3-Acetamido-N-(2-succinimidoethyl)-N-ethylaniline	EKT.
Acetanilide, tech	SAL.
Acetic acid, phenyl ester	BKM.
*Acetoacetanilide	BRD, EKT, HST.
*o-Acetoacetanilide	BRD, EKT, HST.
*o-Acetoacetotoluidide	BRD, EKT, HST.
p-Acetoacetotoluidide	HST.
2',4'-Acetoacetoxylidide	EKT, HST.
Acetoacet-m-xylidide	BRD.
1'-Acetonaphthone	GIV.
Acetophenone, tech	S.
p-Acetotoluidide	EK.
2-Acetylpyridine	RIL.
Aldalene	SRL.
*Alkylbenzenes:	
Alkylbenzene straight-chain (except dodecyl and tridecyl)	MON.
Dodecylbenzene (including Tridecylbenzene):	
Dodecylbenzene, straight-chain	MON, VST.
Dodecylbenzene, other	MON, SOC.
Alkylbenzene all other (except dodecyl, tridecyl and straight-chain)	PLC.
Alkylphenols, mixed	PSG.
Alkylpyridines, mixed	X.
Aluminum chlorohydroxyphthalocyanine blue	PHC.
3'-Aminoacetanilide	CGY.
4'-Aminoacetanilide (Acetyl-p-phenylenediamine)	HST.
3'-Amino-p-acetanilide	HST, SDC.
2-(p-Aminoanilino)-5-nitrobenzenesulfonic acid	CGY.
1-Aminoanthraquinone and salt	SDC.
6-Amino-3,4'-azodibzenesulfonic acid (C.I. Acid Yellow 9) ...	CGY.
p-Aminobenzamide	NSC.
3'-Aminobenzanilide	HST.
o-Aminobenzenethiol	FMT.
p-Aminobenzoic acid, tech	NSC, WYK.
2-Amino-6-benzothiazolesulfonic acid	VPC.
1-Amino-4-bromo-9,10-dihydro-9,10-dioxo-2-anthracenesulfonic acid and sodium salt	VPC.
1-Amino-2-bromo-4-hydroxyanthraquinone	VPC.
2-Amino-5-chloropyridine	RIL.
2-Amino-5-chloro-p-toluenesulfonic acid [SO ₃ H=1]	BAS.
6-Amino-5-chloro-m-toluenesulfonic acid [SO ₃ H=1] (2B Acid)	CYH, DUP.
4-Amino-N,N-di(β-hydroxyethyl)aniline sulfate	WAY.
2-Amino-4,6-dihydropyrimidine	KF.
2-Amino-4,5-dimethoxybenzoic acid, methyl ester	PFZ.
5-Amino-2,3-dimethylbenzenesulfethanolamide	CGY.
3-Amino-9-ethylcarbazole	SDC.
N-Aminohexamethyleneimine	X.
4-Amino-3-hydroxy-1-naphthalenesulfonic acid	CGY.
2-(2-Amino-5-hydroxy-7-sulfo-1-naphthylazo)-5-nitrobenzoic acid	CGY.
3-Amino-4-methoxyacetanilide	CGY.
*4-Amino-5-methoxy-2-methylbenzenesulfonic acid (5-methyl-o-anisidinesulfonic acid)	PSG, VPC, X.
m-[(4-Amino-3-methoxyphenyl)azo]benzenesulfonic acid	VPC.
2-Amino-2-methylpropyl 8-bromotheophyllinate	CHT.
2-Amino-3-methylpyridine	RIL.

SECTION 3. CYCLIC INTERMEDIATES

Table 10—Continued

Cyclic intermediates for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1986

<i>Cyclic Intermediates</i>	<i>Manufacturers' identification codes (according to list in table 11)</i>
Cyclic—Continued	
2-Amino-4-methylpyridine	RIL.
2-Amino-5-methylpyridine	RIL.
2-Amino-6-methylpyridine	RIL.
6-Amino-2-naphthalenesulfonic acid (Broenner's acid)	CGY.
5 (and 8)-Amino-2-naphthol	BUC.
2-Amino-4-nitroacetanilide	SDC.
2-Amino-6-nitrobenzothiazole	VPC.
4-Amino-4'-nitro-2,2'-stilbenedisulfonic acid	CGY.
2-Amino-5-nitrothiazole	PCW.
2-Amino-4-nitrotoluene hydrochloride	PCW.
5-Amino-2-[(2-oxo-5-benzimidazolyl)amino]- benzenesulfonic acid	PFZ.
p-Aminophenol	MAL.
2-(p-Aminophenoxy)ethanol hydrochloride	SCN.
*p-[(p-Aminophenyl)azo]benzenesulfonic acid	ATL, CGY, VPC.
2-(4-Aminophenylazo)-4-methylphenol	VPC.
7-[(4-Aminophenyl)azo]-1,3-naphthalenedisulfonic acid	ACY.
2-Aminopyridine	RIL.
2-Aminothiazole nitrate	PCW.
3-Amino-p-toluamide	HST.
4-Amino-m-toluenesulfonic acid [SO ₃ H=1]	DUP.
6-Amino-m-toluenesulfonic acid [SO ₃ H=1]	CYH, DUP.
m-[(4-Amino-3-tolyl)azo]benzenesulfonic acid	CGY.
*Aniline (Aniline oil)	DUP, FST, ICI, MAL, MOB, RUC, USR, USS.
2-Anilinoethanol	TCH.
7-Anilino-4-hydroxy-2-naphthalenesulfonic acid	CGY.
*Anilinomethanesulfonic acid and salt	ACY, ATL, CGY, VPC.
o-Anisidinomethanesulfonic acid	CGY, VPC.
Anisole, tech	CHF.
Anisoyl chloride	SD.
Anthranilic acid (o-Aminobenzic acid)	PSG.
N,N'-(1,5-Anthraquinonylene)dianthranilic acid	CGY.
Benzaldehyde, tech	KLM.
7-Benzamido-4-hydroxy-2-naphthalenesulfonic acid.....	CGY.
Benzanilide	EK.
Benzenamine, 4,4'-[(2-chlorophenyl)-methylene]bis[N,N- dimethyl]	X.
Benzenesulfonic acid	UPF.
Benzenesulfonic acid, 2-formyl-, sodium salt	X.
Benzenesulfonyl chloride	SFA, UPF.
1,2,4Benzenetricarboxylic acid, 1,2-dianhydride (Trimellitic anhydride)	AMO.
Benzhydrol (Diphenylmethanol)	PD.
Benzimidazole	EK.
1,3-Benzodioxole	AMB.
Benzoic acid, 2-[4-(dimethylamino)-benzoyl]	X.
Benzoic acid, methyl ester	HCF.
*Benzoic acid, tech	KLM, PFZ, VEL.
Benzoin	SFS.
Benzoin isobutyl ether	SFS.
Benzophenone	TLI.
2-Benzothiazolethiol, sodium salt	BFG, BKM, GYR, USR.
1H-Benzotriazole	PSG.
2H-3,1-Benzoxazine-2,4(1H)-dione	ALL.
2-Benzoxazolethiol	EK.
Benzoyl chloride	HK, VEL.
Benzylamine	HXL, KLM.
2-(Benzylamino)ethanol	HXL.
Benzyl ether (Dibenzyl ether)	SFS.
3-(Benzylethylamino)acetanilide	EKT.
2-Benzyl-2'-hydroxy-5,9-dimethyl-6,7-benzomorphanhydro- bromide	SD.
p-(Benzyloxy)phenol	FKE.
1-Benzyl-4-phenylisonipacetonitrile	SDW.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 10—Continued

Cyclic Intermediates for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1986

<i>Cyclic Intermediates</i>	<i>Manufacturers' Identification codes (according to list in table 11)</i>
Cyclic—Continued	
Benzyltrimethylammonium hydroxide	HXL.
*Biphenyl	DOW, KHI, MON, SOC, TCC.
1,4-Bis(3-aminopropyl)piperazine	TX.
2,6-Bis(p-azidobenzylidene)-4-methylcyclohexanone	X.
4,4'-Bis[diethylamino]benzophenone (Ethyl ketone base)	ALD.
4,4'-Bis(dimethylamino)benzhydrol (Michler's hydrol)	X.
1,5-Bis[2,4-dinitrophenoxy]-4,8-dinitroanthraquinone	VPC.
3'-[Bis(2-hydroxyethyl)amino]benzanilide, diacetate ester	TCH.
N,N-Bis(4-methylphenyl)sulfonylamine, potassium salt	EK.
1,2-Bis(tribromophenoxy)ethane	GTL.
p-Bromoaniline	EK.
Bromobenzaldehyde	TNA.
Bromobenzene, mono	DAZ, GTL.
o-Bromobenzoic acid	PD.
4-Bromo-3,5-dihydroxybenzamide	PCW.
4-Bromo-3,5-dihydroxybenzoic acid	PCW.
2-Bromo-4,6-dinitroaniline	CGY, HST, SDC.
1-Bromo-4-ethoxy-2-methylbenzene	TNA, X.
p-Bromofluorobenzene	X.
1-Bromonaphthalene	RSA.
2-Bromopyridine	DAZ.
p-Butoxyphenol	ABB.
p-Butylaniline	TNA.
3-(N-Butylanilino)propionitrile	TCH.
p-tert-Butylbenzaldehyde	GIV.
n-Butylbenzene	PLC.
2-tert-Butyl-p-cresol	PSG.
6-tert-Butyl-m-cresol	PSG.
1-Tert-butyl-2,5-dimethoxybenzene	EKT.
2-[(1-Butyl-2-methylindol-3-yl)carbonyl]benzoic acid	X.
o-sec-Butylphenol	SCN, TNA.
o-tert-Butylphenol	TNA.
p-sec-Butylphenol	SCN.
p-tert-Butylphenol	PSG, SCN.
*Butylphenols, mixed	PSG, SCN, TNA, X.
p-tert-Butyltoluene	GIV.
5-tert-Butyl-1,2,3-trimethylbenzene	GIV.
5-tert-Butyl-m-xylene	GIV.
6-tert-Butyl-2,4-xyleneol	PSG.
1-(Carboethoxy)ethyl-3-(2-chloro-4-(trifluoromethyl)-phenoxy)benzoate	X.
4'-Chloroacetophenone	LIL.
m-Chloroaniline	FST.
o-Chloroaniline	CWN, DUP, LAK.
p-Chloroaniline	DUP.
p-Chlorobenzaldehyde	PD.
Chloro-7H-benz[de]anthracen-7-one (Chlorobenzanthrone)	SDC.
*Chlorobenzene, mono	DOW, PPG, SCC.
p-Chlorobenzenesulfonic acid	UPF.
4-Chloro-2-benzothiazoleimine	SDC.
2-Chloro-1,4-dibutoxybenzene	ALL.
1-Chloro-2,5-dibutoxy-4-nitrobenzene	ALL.
2-Chloro-1,4-diethoxybenzene	ALL.
1-Chloro-2,5-diethoxy-4-nitrobenzene	ALL.
4'-Chloro-2',5'-dimethoxyacetanilide	HST.
5-Chloro-2,4-dimethoxyaniline	ALL.
2-[p-Chloro- α -(2-dimethylaminoethyl)benzyl]pyridine	SK.
2-Chloro-10-[3-(dimethylamino)propyl]phenothiazine	SK.
1-Chloro-2,4-dinitrobenzene (Dinitrochlorobenzene)	SDC.
3-Chlorodiphenylamine	SK.
N-(2-Chloroethyl)-N-ethylaniline	TCH.
p-[(2-Chloroethyl)methylamino]benzaldehyde	VPC.
2-[(Chloromethyl)thio]benzothiazole	BKM.
1-Chloro-2-nitrobenzene (Chloro-o-nitrobenzene)	DUP, MON.

SECTION 3. CYCLIC INTERMEDIATES

Table 10—Continued

Cyclic intermediates for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

<i>Cyclic Intermediates</i>	<i>Manufacturers' Identification codes (according to list in table 11)</i>
Cyclic—Continued	
1-Chloro-4-nitrobenzene (Chloro-p-nitrobenzene)	DUP, MON.
4-Chloro-3-nitrobenzenesulfonamide	CGY.
4-Chloro-3-nitrobenzenesulfonanilide	CGY.
2-Chloro-4-nitrobenzoic acid	SAL.
2-Chloro-5-nitrobenzoic acid	CGY.
2-Chloro-4-nitrobenzoic acid, potassium salt	SAL.
4-Chloro-3-nitrobenzotrifluoride	DAZ.
α -Chloro-4-nitrotoluene	EK.
2-Chloro-4-nitrotoluene	DUP, PCW.
o-Chlorophenol	X.
2-Chlorophenothiazine	SK.
o-Chlorophenylcyclopentyl ketone	PD.
4-Chloro-o-phenylenediamine	FMT.
4-Chlorophthalic acid	PSG.
3-Chloropropyl-2,5-xylol ether	PD.
2-Chloropyridine	OMC.
4-Chlororesorcinol	PCW.
2-(4-Chlorosulfonylphenyl)ethyltrichlorosilane	KF.
7-Chloro-1,2,3,4-tetrahydro-2-methyl-3-(2-methylphenyl)- 4-oxo-6-quinazolinesulfonamide	X.
m-Chlorotoluene	HK.
o-Chlorotoluene	HK.
p-Chlorotoluene	HK.
α -Chlorotoluene (Benzyl chloride)	MON, SFS, VEL.
3-Chloro-p-toluidine [NH ₂ =1]	DUP.
3-(2-Chloro-4-trifluoromethylphenoxy)toluene	CED, X.
p-Chloro- α , α , α -trifluorotoluene	HK.
p-Chloro-o-xylene	SFA.
4-Chloro-3,5-xyleneol	FER.
*Cresols:	
m-Cresol	MER.
*O-Cresol:	
o-Cresol, from petroleum	GE, MER, PSG.
p-Cresol	MER, PSG.
Cresols, mixed:	
(M,P)-Cresol:	
(m,p)-Cresol, from petroleum	MER, NPC, PSG.
Cresylic acid, refined:	
Cresylic acid, refined; from petroleum	MER, PSG.
*Cumene (Isopropyl benzene)	ASH, BTL, GGC, GRS, KHI, SHC, SOC, TX.
4-(Cyanoacetyl)morpholine	DUP.
Cyanoethyl cellulose	FKE.
N-Cyano-s-methyl-N-2(4-methyl-5-imidazolyl)- methylthioethylisothiourea	SK.
2,5-Cyclohexadiene-1,4-dione, dioxime	SDC.
*Cyclohexane	DUP, GRS, PLC, PPR, SOC, SUN, TX, UOC.
1,2-Cyclohexanedicarboxylic acid anhydride	BCC.
1,3-Cyclohexanedione	PD.
Cyclohexanol	ACS, BAS, DUP, MON.
*Cyclohexanone	ACS, BAS, CNP, DUP, MON, UCC.
Cyclohexanone oxime	CNP.
Cyclohexene	USR.
3-Cyclohexene-1-carboxaldehyde	UCC.
4-Cyclohexene-1,2-dicarboxylic anhydride	DKA.
Cyclohexene oxide	USR.
β -(1-Cyclohexenyl)ethylamine	HXL.
Cyclohexylamine	ABB, AIP, CGY, VGC.
Cyclooctadiene	DUP.
Cyclopentene	ALD.
Cyclopropanecarbonyl chloride	PD.
Cyclopropanecarboxylic acid	PD.
2-Cyclopropylmethylamino-5-chlorobenzophenone	PD.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 10—Continued

Cyclic Intermediates for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1986

<i>Cyclic Intermediates</i>	<i>Manufacturers' Identification codes (according to list in table 11)</i>
Cyclic—Continued	
2-(N-Cyclopropylmethyl-N-phthalimidoacetyl)-amino-5-chlorobenzophenone	PD.
p-Cymene	HPC.
Diacenaphtho[1,2-j:1',2'-i]fluoranthene (Decacyclene)	SDC.
3-Diacetoxyethylaminobenzanilide	STC.
Dialkylbenzene	VST.
1,5 (and 1,8)-Diaminoanthraquinone	SDC.
2,4-Diaminobenzenesulfonic acid [SO ₃ H=1]	CGY.
1,3-Diaminocyclohexane	DUP.
1,5-Diamino-4,8-dihydroxyanthraquinone	VPC.
4,4'-Diaminodiphenyl sulfone	TLI.
2,6-Diaminopyridine	RIL.
4,4'-Diamino-2,2'-stilbenedisulfonic acid	CGY.
2,5-Dianilinoterephthalic acid	SDC, VPC.
N,N'-Dibenzylethylenediamine diacetate	DIX.
2,4'-Dibromoacetophenone	ALD.
m-Dibromobenzene	DAZ.
p-Dibromobenzene	DAZ.
(1,2-Dibromoethyl)benzene	DAZ.
2,6-Dibromo-4-nitroaniline	HST.
2,6-Dibromophenol	EK.
p-Dibutoxybenzene (DBB)	ALL.
2,5-Dibutoxy-4-morpholinobenzenediazonium sulfate salt (DBB Sulfate)	ALL.
2,5-Dibutoxy-4-morpholinonitrobenzene	ALL.
2,6-Di-tert-butyl-4-nonylphenol	GAF.
2,4-Di-tert-butylphenol	PSG.
2,6-Di-sec-butylphenol	TNA.
2,6-Di-tert-butylphenol	TNA.
2,6-Di-tert-4-sec-butylphenol	CED.
3,4-Dichloroaniline	DUP.
Dichlorobenzanthrone	SDC.
o (and p)-Dichlorobenzene	SCC.
m-Dichlorobenzene	MON.
*o-Dichlorobenzene	MON, PPG, SCC, SOI.
*p-Dichlorobenzene	MON, PPG, SCC, SOI.
3,3'-Dichlorobenzidine base and salts	CWN, LAK.
3,4-Dichlorobenzotrifluoride	HK, X.
3,5-Dichlorobenzoyl chloride	HK.
Dichlorobenzyl chloride	SFS.
4,6-Dichloro-1,3-dihydroxybenzene	PCW.
Dichlorodiphenylsilane	DCC.
3,3'-Dichloro-4,4'-(2-hydroxy-3-anilido-1-naphthazo)-biphenyl	LAK.
2,6-Dichloro-3-methylaniline	SDC.
2,5-Dichloro-4-(3-methyl-5-oxo-2-pyrazolin-1-yl)benzenesulfonic acid	CGY.
Dichloromethylphenylsilane	DCC.
2,6-Dichloro-4-nitroaniline	CWN.
1,2-Dichloro-4-nitrobenzene	DUP.
2,4-Dichloro-5-nitrotrifluoromethylbenzene	DAZ.
2,5-Dichlorosulfanilic acid [SO ₃ H=1]	VPC.
p-α-Dichlorotoluene	HK.
Dicyclohexylamine	AIP, VGC.
Dicyclohexylamine, nitrate salt	OMC.
*Dicyclopentadiene (Includes Cyclopentadiene)	DOW, ENJ, LYP, SHC, VEL.
α,α-Diethoxyacetophenone	CWN.
p-Diethoxybenzene	ALL.
3'-[2-Diethylamino)ethyl]-4'-hydroxyacetanilide	VPC.
2[4-Diethylamino-2-hydroxybenzyl]benzoic acid	X.
N,N-Diethylaniline	BCC, DUP.
2,6-Diethylaniline	TNA.
Diethylbenzene	DOW, UPM.
N,N-Diethyl-3-ethoxyaniline	X.
N,N-Diethyl-4-methoxymetanilamide	PCW.

SECTION 3. CYCLIC INTERMEDIATES

Table 10—Continued

Cyclic intermediates for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

<i>Cyclic intermediates</i>	<i>Manufacturers' identification codes (according to list in table 11)</i>
<i>Cyclic—Continued</i>	
N,N-Diethyl-p-phenylenediamine	EK.
3,5-Diethyltoluene	TNA.
N,N-Diethyl-m-toluidine	DUP.
N,N-Diethyl-p-toluidine	RSA.
6,11-Dihydrodibenz(b,e)oxepin-11-one	PFZ, SK.
2,3-Dihydro-2,2-dimethyl-7-benzofuranyl	X.
2,3-Dihydro-2,2-dimethyl-7-benzofuranol	FMN.
2-[2-(2,3-Dihydro-1,3-dioxo-1H-inden-2yl)-(quinolinyl)] 6-methylbenzothiazole-7-sulfonic acid	VPC.
2,3-Dihydro-2-[6-methyl-7-sulfo-2-benzothiazolyl]-2- quinolinyl-1,3-dioxo-1H-indene-5-carboxylic acid	VPC.
1,2-Dihydro-2,2,4,7-tetramethylquinoline	EKT.
1,4-Dihydroxyanthraquinone	EKT.
2,6-Dihydroxyanthraquinone	CGY.
2,4-Dihydroxybenzaldehyde	EK.
2,5-Dihydroxy-p-benzenedisulfonic acid, dipotassium salt	X.
3,4-Dihydroxybenzoic acid, methyl ester	PCW.
2,4-Dihydroxybenzophenone	ACY.
1,5-Dihydroxy-4,8-dinitroanthraquinone	VPC.
1,8-Dihydroxy-4,5-dinitroanthraquinone	EKT, VPC.
N,N-Di(β-hydroxyethyl)-m-chloroaniline	MIL.
3,5-Dihydroxy-N-(2-hydroxyethyl)benzamide	PCW.
Diisopropylaniline	TNA.
Diisopropylbenzene	GGC.
m-Dimethoxybenzene	ACY.
2,5-Dimethoxytetrahydrofuran	HEX.
3,4-Dimethoxytoluene	HEX, TNA.
p-(Dimethylamino)benzaldehyde	ATL.
m-(Dimethylamino)benzoic acid	SDH.
2-[4-(Dimethylamino)benzoyl]benzoic acid	EK.
11-[3(Dimethylamino)propyl]-6H-hydroxydibenz(b,e)oxepin.	PFZ, SK.
4-Dimethylaminopyridine	NEP.
N,N-Dimethylaniline	BCC, DUP.
*N,N-Dimethylbenzylamine	ARS, HXL, PSG.
Dimethyl-1,4-cyclohexanedicarboxylate	EKT.
N,N-Dimethylcyclohexylamine	AIP.
5,5-Dimethylhydantoin	GLY.
2,5-Dimethyl-4(2)-morpholinylmethylphenol, hydro-chloride	CGY.
Dimethyl-2,6-naphthalenedicarboxylate	UTC.
N,N-Dimethyl-o-toluidine	RSA.
N,N-Dimethyl-p-toluidine	FST, RSA.
1,5(and 1,8)-Dinitroanthraquinone	SDC.
m-Dinitrobenzene	DUP.
Dinitrobenzene-nitrobenzene mixture (30/70)	SAL.
2,4-Dinitrobenzenesulfonic acid, sodium salt	EK.
3,5-Dinitrobenzoyl chloride	ALD.
3,5-Dinitrochlorobenzenesulfonic acid, potassium salt	LAK.
2,4-Dinitrophenol, tech	SDC.
2,4-Dinitrophenoxyethanol	HML, OMC.
3,5-Dinitrosalicylic acid, methyl ester	SAL.
p-Dinitrosobenzene	LC.
4,4'-Dinitrostilbene-2,2'-disulfonic acid	CGY.
2,4-Dinitrotoluene	DUP, RUC.
2,4(and 2,6)-Dinitrotoluene	DUP, MOB, RUC, X.
3,5-Dinitro-o-toluidic acid	SAL.
Dinonylhydroxybenzenesulfonic acid	X.
Dinonylphenol	GAF, TX.
Di-para-benzoquinone dioxime	LC.
2,4-Di-tert-pentylphenol	PAS.
1,5-Diphenoxyanthraquinone	VPC.
Diphenylamine	RUC, USR, USS.
Diphenylcarbonyl chloride	CED.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 10—Continued

Cyclic Intermediates for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1986

<i>Cyclic Intermediates</i>	<i>Manufacturers' identification codes (according to list in table 11)</i>
Cyclic—Continued	
Diphenyldimethoxysilane	KF.
Diphenyldisulfide	PAH.
Diphenylmethane	CWN.
Diphenyl phthalate	EK.
1,3-Di-4-piperidylpropane	RIL.
1,4-Di-p-toluidinoanthraquinone	CGY.
1,5-Diureidonaphthalene	SOI.
Divinylbenzene	DOW.
Dodecylaniline	MON.
Dodecylmethylbenzyl chloride	RH.
*p-Dodecylphenol	GAF, MCB, MON, SOC.
Doxepin base	SK.
4-Ethanopiperidine	RIL.
5-Ethanoxy-3-trichloromethyl-1,2,4-thiadiazole	OMC.
2,2'-(1,2-Ethenediy)bis[5-[4-chloro-6-(phenylamino)-1, 3,5-triazin-2-yl]amino]benzenesulfonic acid, disodium salt	X.
Ethisterone	SRL, UPJ.
4(5)-Ethoxycarbonyl-5(4)-methylimidazole	SK.
1-Ethoxy-3-methylbenzene	X.
4-Ethoxy-2-methyl-N-phenylaniline	X.
4-Ethoxy-2-nitroacetamide	CGY.
Ethyl-alpha-cyano-beta-methyl cinnamat	PD.
3'-(Ethylamino)acetamide	EKT.
o-Ethylaniline	TNA.
N-Ethylaniline, refined	BCC, DUP, FST.
2-(N-Ethylanilino)ethanol	MIL, TCH.
3-(N-Ethylanilino)propionitrile	MIL, TCH.
α-(N-Ethylanilino)-m-toluenesulfonic acid	SDH.
*Ethylbenzene	AMO, ATR, CSD, DOW, ELP, HST, KHI, MCB, MON, SDH, SOC.
Ethylbenzyl chloride	SFS.
2-(N-Ethyl-N,β-cyanoethyl)-4-acetaminoanisole	CGY, TCH.
N-Ethyl-N-(2,3-dihydroxypropyl)-m-toluidine	EKT.
N-Ethylmaleimide	REG.
1-Ethyl-3-methylhydantoin	GLY.
1-Ethyl-2-methylindole	X.
9-Ethyl-3-nitrocarbazole	SDC.
N-Ethyl-N-phenylbenzylamine	SDH.
3-Ethylpyridine	RIL.
N-Ethyl-N-(3'-sulfobenzyl)aniline	VPC.
N-Ethyl-m-toluidine	DUP, FST.
3-(N-Ethyl-m-toluidino)propionitrile	TCH.
9-Fluorenone	MCK.
o-Fluorobenzoyl chloride	OMC.
1-Formylpiperidine	RIL.
Furan	QKO.
Furfuryl alcohol	QKO.
1-(2-Furoyl)piperazine	PFZ.
Hexachlorocyclopentadiene	VEL.
1,4,5,6,7,7-Hexachloro-5-norbornene-2,3-dicarboxylic anhydride (Chlorendo anhydride)	VEL.
Hexamethyleneimine	CXI, DUP.
Hydroquinone, tech	EKT, GYR.
p-Hydroxybenzenesulfonic acid	UPF.
p-Hydroxybenzoic acid	LEM.
4-Hydroxy-2H-1,2-benzothiazine-3-carboxylic acid, methyl ester, 1,1-dioxide	PFZ.
4-Hydroxybenzylbenzene	TNA.
2-Hydroxycineole	X.
2'-Hydroxy-5,9-dimethyl-6,7-benzomorphan	SD.
3-[N-(2-Hydroxyethyl)anilino]propionitrile	TCH.
4-Hydroxymetanilamide	CGY.

SECTION 3. CYCLIC INTERMEDIATES

Table 10—Continued

Cyclic intermediates for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1986

<i>Cyclic Intermediates</i>	<i>Manufacturers' identification codes (according to list in table 11)</i>
Cyclic—Continued	
4-Hydroxy-2-methyl-2H-1,2-benzothiazine-3-carboxylic acid, methyl ester, 1,1-dioxide	PFZ.
2-Hydroxymethylene-17 α -ethinylandrosta-17-ol-4-en-3-one	SD.
4(5)-Hydroxymethyl-5(4)-methylimidazole	SK.
4(5)-Hydroxymethyl-5(4)-methylimidazole hydrochloride	SK.
3-Hydroxy-N-(3-N-morpholino- γ -propyl)-2-naphthimide	PCW.
7-Hydroxy-1,3-naphthalenedisulfonic acid, disodium salt	SDH.
3-Hydroxy-2-naphthoic acid (B.O.N.)	PCW.
3-Hydroxy-2-naphthoic acid, ethanolamide	PCW.
1-Hydroxynaphthoic acid, methyl ester	PCW.
3-Hydroxy-2-naphthoic acid, methyl ester	PCW.
3-Hydroxy-2-naphthoic acid, sodium salt	PCW.
2-Hydroxy-1,4-naphthoquinone	SAL.
1-(2-Hydroxy-1-naphthylazo)-6-nitro-2-hydroxynaphthalene-4-sulfonic acid	CGY.
p-Hydroxyphenyl-3-methylbutyric acid	HEX.
10-(p-Iodophenyl)undecanoic acid, ethyl ester	X.
*Isobutylbenzene	PLC, PSG, TNA.
*Isocyanic acid derivatives:	
Bitoluene diisocyanate (TODI)	CWN.
Diphenylmethane-4,4'-diisocyanate (MDI)	BAS, DOW, MOB, RUC.
Phenylisocyanate	MOB.
*Polymethylene polyphenylisocyanate	BAS, MOB, RUC.
Polysulfone monomer	UCC.
Toluene 2,4-diisocyanate	MOB.
*Toluene 2,4-and 2,6-diisocyanate (80/20 Mixture)	BAS, DOW, MOB, OMC, RUC.
Toluene 2,4-and 2,6-diisocyanate (65/35 Mixture)	MOB.
p-Toluenesulfonyl isocyanate	CWN.
All other isocyanic acid derivatives	MOB, UCC.
Isonicotinamide	RIL.
Isophthalic acid (Benzene-1,3-dicarboxylic acid)	AMO.
Isophthalonitrile	DUP, PSG.
Isophthaloyl chloride	DUP, TLC.
Isopropylbiphenyl	TCC.
4,4'-Isopropylidenebis[2,6-dibromophenol] (Tetrabromobisphenol A)	DOW.
*4,4'-Isopropylidenediphenol (Bisphenol A)	ARK, DOW, GE, SHC, USS.
4,4'-Isopropylidenediphenol, ethoxylated	ICI.
4,4'-Isopropylidenediphenol, propoxylated	ICI.
o-Isopropylphenol	FMC, PSG.
Isothiocyanic acid, phenyl ester	EK.
Leuco quinizarin (1,4,9,10-Anthratetrol)	CGY.
Malonanilide	PCW.
Melamine	ACY, MLC.
dl-p-Mentha-1,8-diene (Limonene)	ARZ, NCI.
N-(4-Methoxy-3-nitrophenyl)acetamide	SDC.
(p-Methoxyphenyl)acetic acid	HEX.
N[4[1-[(2-Methoxyphenylamino)carbonyl]-2-oxopropylazophenyl]-4-[1[(2-methoxyphenylamino)carbonyl]-2-oxopropylazo]-benzamide]	X.
2-(N-Methylanilino)ethanol	TCH.
3-(N-Methylanilino)propionitrile	TCH.
2-Methylantraquinone	ACY.
2-Methylbenzothiazole	FMT.
o-Methylbenzylchloride	TLC.
N-Methylbenzylamine	HXL.
Methyl benzyl ether	GRS.
Methylcyclohexane	PLC.
Methyl 3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropane carboxate	FMN.
2-Methyl-4,6-dinitrophenol (4,6-Dinitro-o-cresol)	CPS.
4-Methyl-2,6-dinitrophenol	PSG.
4,4-Methylenebis (2,6-di-tert-butylphenol)	TNA.
4,4'-Methylenebis[N,N-diethylaniline]	ACY.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 10—Continued

Cyclic intermediates for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1986

<i>Cyclic Intermediates</i>	<i>Manufacturers' identification codes (according to list in table 11)</i>
Cyclic—Continued	
4,4'-Methylenebis[N,N-dimethylaniline] (Methane base)	ACY, SDH.
4,4'-Methylenedianiline	RUC, USR.
1,2-Methylenedioxy-4-nitrobenzene	PD.
5,5'-Methylenedisalicylic acid	KLM.
N-Methyl-2-ethanolinpiperidine	RIL.
Methyl p-formylbenzoate	EKT.
Methylhydroquinone	EKT.
(2,4-Methyl-5-imidazolyl)methylthioethylamine dihydrochloride	SK.
4-Methyl-2-imino-1,3-dithiolane hydrochloride	LAK.
4-Methyl-N-((4-methylphenyl)sulfonyl)benzenesulfonamide	EK.
N-Methyl-p-nitroaniline	ACY.
4-Methyl-2-nitroanisole	PSG.
3-Methyl-2-nitrobenzoic acid	SAL.
2-Methyl-5-norbornene-2,3-dicarboxylic anhydride	BCC.
m-(3-Methyl-5-oxo-2-pyrazolin-1-yl) benzenesulfonic acid	CGY.
2-Methyl-5-phenylbenzoxazole	EK.
Methyl phenyl sulfide (Thioanisole)	PAH.
4-Methylphthalic acid	EK.
N-Methylphthalimide	LAK.
4-(4'-Methylpiperidine)pyridine	RIL.
α-Methylstyrene	GGC, TX, USS.
*ar-Methylstyrene (Vinyltoluene)	BTL, DOW, HST.
Mono-Dodecyl biphenyl (mixed isomers)	X.
Myristylbenzyltrimethylammonium chloride.2H ₂ O	PCW.
1-Naphthaldehyde	GNW.
1,5-Naphthalenedisulfonic acid, 2-amino-, monosodium salt	X.
1-Naphthalenesulfonic acid, 8-(phenylamino)-monosodium salt	SDC.
1-Naphthalenesulfonic acid, sodium salt	CGY.
2-Naphthalenesulfonic acid, sodium salt	GNW.
1,4,5,8-Naphthalenetetracarboxylic acid	CGY.
Naphthalimide	SDC, VPC.
1-Naphthol (α-Naphthol)	UCC.
Naphth[1,2-d][1,2,3]oxadiazole-5-sulfonic acid	CGY.
1-Naphthylamine (α-Naphthylamine)	DUP.
p-(2-Naphthylamino)phenol (N-(p-Hydroxyphenyl)-2- naphthylamine)	SDC.
Nicotinonitrile (3-Cyanopyridine)	NEP.
3-Nitro-6-pyrrolidiny I toluene	ALL.
3'-Nitroacetanilide	EKT.
o-Nitroaniline	BUC, DUP, MON.
p-Nitroaniline	DUP, MON.
5-Nitroanthranilic acid	CGY, TLI.
1-Nitroanthraquinone	SDC.
p-Nitrobenzamide	PD.
*Nitrobenzene	DUP, FST, ICI, MOB, RUC.
m-Nitrobenzenesulfonic acid, sodium salt	USM.
m-Nitrobenzoic acid	SAL, SDH.
o-Nitrobenzoic acid	SAL.
p-Nitrobenzoic acid	DUP.
m-Nitrobenzoic acid, sodium salt	SAL.
2-Nitro-N-benzoylaniline	SAL.
2-Nitro-p-cresol	PSG.
Nitrodiphenylamine	ACY, MON.
5-Nitroisophthalic acid	SAL.
3-Nitro-4-methylacetophenone	TLI.
4-Nitro-N-methylphthalimide	LAK.
1-Nitronaphthalene	DUP.
7 (and 8)-Nitronaphth[1,2-d][1,2,3]oxadiazole-5-sulfonic acid ..	CGY.
p-Nitrophenethyl alcohol	PCW.

SECTION 3. CYCLIC INTERMEDIATES

Table 10—Continued

Cyclic intermediates for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1986

<i>Cyclic Intermediates</i>	<i>Manufacturers' Identification codes (according to list in table 11)</i>
Cyclic—Continued	
o-Nitrophenol	MON.
p-Nitrophenol	DUP, MON.
p-Nitrophenol, sodium salt	DUP.
2-(o-Nitrophenylazo)-4,6-di-tert-pentylphenol (OH=1)	CGY.
2-(p-Nitrophenyl)-2H-naphthol[1,2-d]triazole-6,8- disulfonic acid	CGY.
5-Nitrosalicylaldehyde	EK.
p-Nitrosophenol	LC, SDC, VPC(E).
4-Nitrosophenol, sodium salt	SDC.
m-Nitrotoluene	DUP, FST.
o-Nitrotoluene	DUP, FST.
p-Nitrotoluene	DUP, FST.
Nitrotoluene mixtures	FST.
p-Nitrotoluene-o-sulfonic acid	CGY.
*Nonylphenol	GAF, KLM, MCB, MON, RH, SCN, TX.
Octyldimethyl-p-aminobenzoate	HXL.
n-Octylglucamine	X.
Octylphenol	PSG, RH, SCN.
3-Oxo-1,2-benzisothiazoline-2-acetic acid, methyl ester, 1,1-dioxide	PFZ.
5-Oxo-1-phenyl-2-pyrazoline-3-carboxylic acid, ethyl ester	HST.
Oxaluminum benzoate	CHT.
4,4'-Oxydianiline	DUP.
Parahydroxyphenylglycine potassium methyl danc salt	KAN.
para-Pentyloxyphenol	EK.
Pentabromochlorocyclohexane	DOW.
Pentabromoethylbenzene	TNA.
1,1,3,3,5-Pentamethylindan	GIV.
o-Pentylphenol (o-Amylphenol)	PAS, X.
p-tert-Pentylphenol	PAS.
Permethrin acid chloride	CED.
3,4,9,10-Perylenetetracarboxylic-3,4:9,10-dianhydride	VPC.
3,4,9,10-Perylenetetracarboxylic-3,4:9,10-dilimide	SDC, VPC.
Perylo[3,4-cd:9,10-c'd']dipyrans-1,3,8,10-tetrone	SDC.
1,10-Phenanthroline	VNC.
2-Phenethylamine	HXL.
p-Phenetidine	MON, VGC.
*Phenol:	
Natural:	
From Petroleum:	
Phenol, natural, from petroleum, U.S.P.	MER.
All other phenol, natural, from petroleum	PSG.
Synthetic:	
Phenol, benzylated	MIL.
Phenol, styrenated	MIL.
Phenol, synthetic, from chlorobenzene by vaporphase hydrolysis, U.S.P.	TX.
*Phenol, synthetic, from cumene by oxidation, U.S.P. ...	ACS, BTL, DOW, GCC, GE, SHC, USS.
Phenol, synthetic, from toluene by oxidation, U.S.P.	KLM.
Phenolsulfonaphthalein, sodium salt	EK.
Phenolsulfonic acid	PSG, SAL.
Phenolsulfonic acid, sodium salt	SAL.
Phenoxyacetic acid, sodium salt	NCC.
3-Phenoxybenzaldehyde	TNA.
3-Phenoxybenzaldehyde cyanohydrin	TNA.
3-Phenoxybenzenemethanol	TNA.
2-(Phenoxyethyl)benzoic acid	PFZ.
m-Phenoxytoluene	MER.
4-(Phenylazo)diphenylamine	EK.
2-Phenylbenzimidazole	SAL.
m-Phenylenediamine	DUP, FST.
o-Phenylenediamine	CGY, DUP, PSG.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 10—Continued

Cyclic Intermediates for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1985

<i>Cyclic Intermediates</i>	<i>Manufacturers' Identification codes (according to list in table 11)</i>
Cyclic—Continued	
p-Phenylenediamine	DUP, NES.
Phenyl ether (Diphenyl oxide)	DOW, MON.
d(+)- α -Phenylethylamine	HXL.
N-Phenylglycine	EK.
Phenylglycine, potassium salt	BCC, KAN.
Phenylglycine, sodium salt	BCC, LIL.
Phenyhydroquinone	EKT.
2,2'-[(Phenyl)imino]diethanol (N-Phenyldiethanolamine)	MIL, TCH.
Phenylmercuric carboxylate	COS.
Phenyl- α -naphthylamine	UCC.
o-Phenylphenol	DOW.
p-Phenylphenol	DOW.
o-Phenylphenol, sodium salt	DOW.
N-Phenyl-p-phenylenediamine	USR.
Phenylphosphinic acid	FER.
Phenylphosphonothioic dichloride	SFA.
Phenylphosphorous dichloride	FER.
1-Phenyl-1,2-propanedione, 2-oxime	ORT.
4-Phenylpropylpyridine	RIL.
4-Phenylpyridine-N-oxide	RIL.
di-Phenylsuccinic acid	PD.
4-Phenylthiomorpholine-1,1-dioxide	EKT.
Phenyltriethoxysilane	KF.
Phthalic acid	EK.
*Phthalic anhydride	BAS, ENJ, KPT, MON, STP, TU.
Phthalimide	PSG.
Phthalimidoacetic acid	PD.
Phthalocyaninato(2-)copper	PHC.
Phthalocyaninetetrasulfonyl chloride, copper derivative	SDC, VPC.
Phthaloyl chloride (Phthalyl chloride)	TLC.
Picolines:	
Picoline (3,4-mixture)	RIL.
2-Picoline (α -Picoline)	RIL.
3-Picoline (β -Picoline)	NEP, RIL.
4-Picoline (γ -Picoline)	RIL.
2-Picoline-N-oxide	RIL.
3-Picoline-N-oxide	RIL.
Picolinic acid	NEP.
Picolinonitrile (2-Cyanopyridine)	NEP.
3-Picolylamine	RIL.
Picric acid (Trinitrophenol)	SDC.
Pipelic acid	RIL.
Piperidine	AIP.
Polyethylbenzene (80 percent diethylbenzene)	ELP.
Propiophenone	HEX, NES, ORT.
8,16-Pyranthrednone	PCW.
1,3,6,8-Pyrenetetrasulfonic acid	X.
Pyridine, refined:	
2 Pyridine, refined	NEP, RIL.
Pyridine, refined all other grades	CGY, RIL.
3-Pyridinemethanol	RIL.
2 Pyridinethiol-1-oxide, sodium salt	OMC.
2 Pyridinethiol-1-oxide, zinc salt	OMC.
2-Pyrimidinol	CGY.
2-Pyrrolidinone (2-Pyrrolidone)	GAF.
Pyrvinium pamoate	X.
Quinoline:	
Quinoline-2,3-dicarboxylic acid	NES.
Quinolinium-1-phenylmethy l chloride	X.
Quinoline, other grades	ATL.
Quinone dioxime	LC.
Resorcinol, tech,	KPT.
β -Resorcylic acid, lead salt	KPT.

SECTION 3. CYCLIC INTERMEDIATES

Table 10—Continued

Cyclic intermediates for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

<i>Cyclic intermediates</i>	<i>Manufacturers' identification codes (according to list in table 11)</i>
Cyclic—Continued	
Salicylaldehyde	RDA.
Salicylaldehyde oxime	EK.
Salicylanilide	PCW.
*Salicylic acid, tech	DOW, KLM, MON, SDH.
Sodium p-sulfophenylmethyl ether	SAL.
Sodium trichlorobenzenesulfate	UPF.
*Styrene (Vinylbenzene)	AMO, ATR, CSD, DOW, ELP, HST, MCB, MON, PLC, SDH, SHC, SOC.
Sulfaguanidine	SAL.
5-Sulfoisophthalic acid, 1,3-dimethyl ester	PCW.
5-Sulfoisophthalic acid, 1,3-dimethyl ester, sodium salt	DUP.
5-Sulfoisophthalic acid, sodium salt	PCW.
4-Sulfophthalic acid	CWN.
Terephthalic acid	AMO, HCF.
*Terephthalic acid, dimethyl ester	DUP, EKT, HCF.
Terephthaloyl chloride	DUP, TLC.
Terephthaloyldiacetic acid, diethyl ester	PCW.
Terphenyl (Phenylbiphenyl) (m-, o-, and p-isomers)	MON.
Terpinene-4-ol	X.
Tetrabromophthalic anhydride	SDH.
1,2,4,5-Tetrachloro-3-nitrobenzene	MON.
Tetrachlorophthalic anhydride	UCC.
Tetrahydrobenzyl alcohol	BAS, DUP, GAF, QKO.
*Tetrahydrofuran	UCC.
1,2,3,4-Tetrahydronaphthalene	KHI.
1,2,4,5-Tetramethylbenzene (Durene)	GAF.
p-(1,1,3,3-Tetramethylbutyl)phenol	SDC.
1,3,6,8-Tetranitro-9H-carbazole	HXL.
Tetrahydrofurfurylamine	CRZ.
Thiodiphenol	SFS.
2-Thiopheneacetic acid	SFS.
2-Thiopheneacetonitrile	SFS.
2-Thiopheneacetyl chloride	SFA.
Thiophenol	OMC.
Toluene-2,3-(and 3,4)-diamine (35/65 Mixture)	RUC, UCC, X.
Toluene-2,4-diamine (4-m-Tolylendiamine)	OMC.
Toluene-2,4-(and 2,6)-diamine (80/20 Mixture)	X.
Toluene-3,4-diamine	NES.
Toluenediamine-bis-maleimide	NES, UPF.
p-Toluenesulfonic acid	NES.
p-Toluenesulfonic acid, aniline salt	NES.
p-Toluenesulfonic acid, copper salt	TEN.
p-Toluenesulfonic acid monohydrate	UPF.
o-Toluenesulfonyl chloride	MON.
p-Toluenesulfonyl chloride	WTC.
m-Toluic acid	DUP, FST.
m-Toluidine	ALD, DUP, FST.
o-Toluidine	DUP, FST.
p-Toluidine	ATL.
m-Toluidinomethanesulfonic acid	CGY.
o-Toluidinomethanesulfonic acid	MIL, TCH.
2,2'-(m-Tolylimino)diethanol	TCH.
2,2'-(m-Tolylimino)diethanol, diacetate ester	MCB, PGG.
Tolytriazole	SK.
2,4,6-Triamino-5-nitrosopyrimidine	GTL.
2,4,6-Tribromophenol	PCW.
3,4',5-Tribromosalicylanilide	PPG, SCC.
1,2,3(and 1,2,4)-Trichlorobenzene	SCC.
1,2,4-Trichlorobenzene	CWN.
1,1,1-Trichloro-2,2-diphenylethane	OMC.
3-Trichloromethyl-1,2,4-thiadiazole	PCW.
1,2,4-Trichloro-5-nitrobenzene	DCC.
Trichlorophenylethane	HK, VEL.
α,α,α -Trichlorotoluene (Benzotrichloride)	

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 10—Continued

Cyclic intermediates for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1986

<i>Cyclic Intermediates</i>	<i>Manufacturers' identification codes (according to list in table 11)</i>
Cyclic—Continued	
2,4,6-Trichloro-s-triazine (Cyanuric chloride)	DGC.
TPEL Trimellitic anhydride, acid chloride	X.
Trimellitic trichloride	TLC.
Trimelic acid	AMB.
1,2,4-Trimethylbenzene (Pseudocumene)	KHI.
1,3,5-Trimethylbenzene (Mesitylene)	ABB.
1,3,3-Trimethyl-γ,α -Indoleacetaldehyde	VPC.
Trimethylphenylammonium chloride	X.
Triphenylmethane	EK.
Triphenylphosphine	X.
α, α', α''-Tris(dimethylamino)mesitol	RH.
Tris(2-methyl-1-aziridinyl)phosphine oxide	ARS.
7,7'-Ureylenebis[4-hydroxy-2-naphthalenesulfonic acid] (J-Acid urea)	S.
Veratraldehyde (3,4-Dimethoxybenzaldehyde)	GIV.
Vinylcyclohexene monoxide	UCC.
2-Vinylpyridine	RIL.
4-Vinylpyridine	RIL.
m-Xylene (90-100% of m-xylene isomer)	AMO.
*o-Xylene (90-100% of o-xylene isomer)	ENJ, KHI, LYP, PPR, TOC.
*p-Xylene (90-100% of p-xylene isomer)	AMO, ENJ, KHI, PPX, SOC, STX, TOC.
2,4-Xylenesulfonic acid	UPF.
Xylenesulfonic acid, mixed isomers	NES.
2,6-Xylenol	GE.Xylenols:
Xylenols:	
Xylenol, low boiling point	MER.
Xylidines:	
Xylidine, original mixture	DUP.
All other cyclic intermediates	ACY, ANG, ARA, CGY, DUP, FER, HCF, HEX, HK, HST, HXL, LC, MCK, MIL, MRT, NES, NOD, OMC, PAH, PCW, PD, PFZ, PSG, RIL, SCH, SDC, SD, SDW, SFS, SOL, SRL, STC, TCH, TNA, UCC, UPJ, VPC, WTC, X, X, X, X, X, X, X, X, X, X.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

SECTION 3. CYCLIC INTERMEDIATES

Table 11

Cyclic intermediates alphabetical directory of manufacturers by code, 1986

(Names of manufacturers that reported production and/or sales of crude products from petroleum and natural gas for chemical conversion to the U.S. International Trade Commission for 1986 are listed below in the order of their identification codes as used in table 10)

<i>Code</i>	<i>Name of company</i>	<i>Code</i>	<i>Name of company</i>
ABB	Abbott Laboratories		
ACY	American Cyanamid Co.	FER	Ferro Corp.:
ACS	Allied Signal Inc. Engineered Material Sector		Ferro Chemical Div.
AIP	Air Products & Chemicals, Inc.		Grant Chemical Div.
ALD	Aldrich Chemical Co., Inc.	FKE	Frank Enterprises, Inc.
ALL	Alliance Chemical, Inc.		
AMB	American Bio-Synthetics Corp.	FMC	FMC Corp.:
AMO	Amoco Corp.	FMN	Agricultural Chemical Group
ANG	Angus Chemical Co.	FMT	Fairmount Chemical Co., Inc.
ARK	Armstrong World Industries, Inc.	FST	First Chemical Corp.
ARS	Areynco, Inc.		
ARZ	Arizona Chemical Co.	GAF	GAF Corp., Chemical Group
ASH	Ashland Oil, Inc., Ashland Petroleum Co.	GE	General Electric Co.
ATL	Atlantic Industries, Inc.	GGC	Georgia-Gulf Corp.:
ATR	Atlantic Richfield Co., Arco Chemical Co.		Boundbrook Div.
			Houston Div.
			Plaquemine Div.
BAS	BASF Corp.	GIV	Givaudan Corp
BCC	Buffalo Color Corp.	GLY	Glyco, Inc.
BFG	B. F. Goodrich Co., B. F. Goodrich Chemical Group	GNW	Greenwood Chemical Co.
BKM	Buckman Laboratories, Inc.	GRS	Champlin Petroleum Co.
BRD	Lonza, Inc.	GTL	Great Lakes Chemical Corp.
BRS	Bristol-Myers Co.	GYR	Goodyear Tire & Rubber Co.
BTL	BTL of Illinois, Inc.		
BUC	Synalloy Corp., Blackman Uhler Chemical Div.	HCF	Cape Industries
		HEX	Hexagon Laboratories, Inc.
		HK	Occidental Chemical Corp., Industrial & Specialty Chemical Div.
CED	Cedar Chemical Co.		
CGY	Ciba-Geigy Corp.	HML	Hummel Chemical Co.
CHF	Kincaid Enterprises, Inc.	HPC	Hercules, Inc.
CHT	Chattem, Inc.	HST	American Hoechst Corp.:
CNP	Nipro, Inc.		Petrochemicals/Plastics Group
COS	Cosan Chemical Corp.		Specialty Products Group, Rhode Island Works
CPS	CPS Chemical Co., Inc.	HXL	Hexcel Corp., Hexcel Chemical Products
CRZ	Crown Zellerbach Corp., Chemical Products Div.		
CSD	Fina Oil & Chemicals Co., Cosden Chemical Div.	ICI	ICI Americas, Inc., Chemicals Div.
CWN	Upjohn Co., Fine Chemical		
CXI	Chemical Exchange Industries, Inc.	KAN	Kanasco, Ltd
CYH	Cychem, Inc.	KF	Dynamit Nobel Chemicals, Inc.
		KHI	Koch Refining Co.
DAZ	Diaz Chemical Corp.	KLM	Kalama Chemical, Inc.
DCC	Dow Corning Corp.	KPT	Koppers Co., Inc.
DGC	Degussa Corp.		
DIX	Dixie Chemical Co., Inc.	LAK	Bofors Nobel, Inc.
DKA	Denka Chemical Corp.	LC	Lord Corp., Chemical Products Group
DOW	Dow Chemical Co.	LEM	Napp Chemicals, Inc.
DUP	E. I. duPont de Nemours & Co., Inc. Chemicals and Pigments Dept. Petrochemicals Dept.	LIL	Ell Lilly & Co.
		LYP	Lyondell Petrochemical Co.
EK	Eastman Kodak Co.:		
EKT	Tennessee Eastman Co. Div.	MAL	Mallinckrodt, Inc.
ELP	El Paso Products Co.		
ENJ	Exxon Chemical Americas		

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 11—Continued

Cyclic Intermediates alphabetical directory of manufacturers by code, 1986

<i>Code</i>	<i>Name of company</i>	<i>Code</i>	<i>Name of company</i>
MCB	Borg-Warner Corp., Borg-Warner Chemicals	SDC	Sandoz Chemicals Corp.
MCK	MacKenzie Chemical Works, Inc.		Sterling Drug, Inc.:
MER	Merichem Co.	SDH	SDI Divestiture Corp.
MIL	Milliken & Co., Milliken Chemical Co.	SDW	Sterling Organics Div.
MLC	Melamine Chemicals, Inc.	SFA	Stauffer Chemical Co.:
MOB	Mobay Chemical Corp. Pittsburgh Div.		Agricultural Products Div.
MON	Monsanto Co.	SFS	Specialty Group
MRT	Morton-Thiokol, Inc., Morton Chemical Div.	SHC	Shell Oil Co., Shell Chemical Co. Div.
		SK	SmithKline Chemicals
NCC	Niacet, Inc.	SOC	Chevron Corp., Chevron Chemical Co.
NCI	Union Camp Corp., Terpene & Aromatics Div.	SOI	Specialty Organics, Inc.
NEP	Nepera, Inc.	SRL	G. D. Searle & Co.
NES	Ruetgers-Nease Chemical Co.	STC	American Hoechst Corp., Sou-Tex Works
NOD	Nuodex, Inc.	STP	Stepan Chemical Co.
NPC	Northwest Petrochemical Corp.	STX	St. Croix Petrochemical Corp.
NSC	National Starch & Chemical Corp.	SUN	Sun Company, Inc.
OMC	Olin Corp.		
ORT	Roehr Chemicals, Inc.	TCC	Sybron Chemical, Inc.
		TCH	Emery Industries, Inc., Tylon Div.
PAH	Parish Chemical Co.	TEN	Tennessee Chemical Co.
PAS	Pennwalt Corp.	TLC	Twin Lake Chemical, Inc.
PCW	Pfiester Chemical, Inc.	TLI	Teledyne Industries Inc., Teledyne McCormick Seiph
PD	Parke-Davis Div. of Warner-Lambert Co.		
PEL	Peiron Corp.	TNA	Ethyl Corp.
PFZ	Pfizer, Inc., & Pfizer Pharmaceuticals, Inc.	TOC	Tenneco Oil Co.
PHC	Phthalchem, Inc.	TRD	Squibb Manufacturing, Inc.
PLC	Phillips Petroleum Co.	TU	Tenn-USS Chemicals Co.
PPG	PPG Industries, Inc.	TX	Texaco, Inc., Texaco Chemical Co.
PPR	Phillips Puerto Rico Core, Inc.		
PPX	Phillips Paraxylene, Inc.	UCC	Union Carbide Corp.
PSG	PMC Specialties Group Inc.	UOC	Union Oil Co., of California
		UPF	Jim Walter Resources, Inc., CIC Div.
QKO	QO Chemicals, Inc.	UPJ	Upjohn Co
		UPM	UOP, Inc.
RDA	Rhone-Poulenc, Inc.	USM	Crown Metro, Inc.
REG	Regis Chemical Co.	USR	Unifroyal, Inc., Unifroyal Chemical Div.
RH	Rohm & Haas Co.	USS	U.S. Steel Corp., USS Chemicals Div.
RIL	Relly Tar & Chemical Corp.	UTC	Unitex Chemical Corp.
RSA	R.S.A. Corp.		
RUC	Rubicon, Inc.	VEL	Velsicol Chemical Corp.
		VGC	Virginia Chemicals, Inc.
S	Sandoz, Inc.	VNC	Vanderbilt Chemical Corp.
SAL	Salebury Laboratories, Inc.	VPC	Mobay Chemical Corp., Dyes & Pigments Div.
SCC	Standard Chlorine of Delaware, Inc.	VST	Vista Chemical Co.
SCN	Schenectady Chemicals, Inc.		
SD	Sterling Drug, Inc., Sterling Pharmaceuticals, Inc.	WAY	Olin Hunt Specialty Products, Inc.
		WTC	Witco Chemical Corp.
		WYK	Wyckoff Chemical Co., Inc.

Note.—Complete names, telephone numbers, and addresses of the above reporting companies are listed in app. A.
Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

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SYNTHETIC ORGANIC CHEMICALS, 1986

SECTION 4. DYES

Stephen Wanser

202-523-0496

Synthetic dyes are derived in whole or in part from cyclic intermediates. Approximately two-thirds of the dyes consumed in the United States are used by the textile industry to dye natural and synthetic fibers or fabrics; about one-sixth is used for coloring paper; and the rest is used chiefly in the production of organic pigments and in dyeing leather and plastics. Of the several thousand different synthetic dyes that are known, more than one thousand are manufactured by domestic producers, collectively. The large number of dyes results from the many different types of materials to which dyes are applied, the different conditions of service for which dyes are required, and the cost that a particular use can bear. Commercial dyes are formulated products which are sold in a variety of physical forms (e.g., granular, powders, liquids, and pastes) containing concentrations of colorant ranging from 6 percent (approximately) to 100 percent. In the statistical tables, production and sales quantities are expressed in terms of a standard strength of product (based on dyeing performance) and not in terms of the amount of actual colorant.

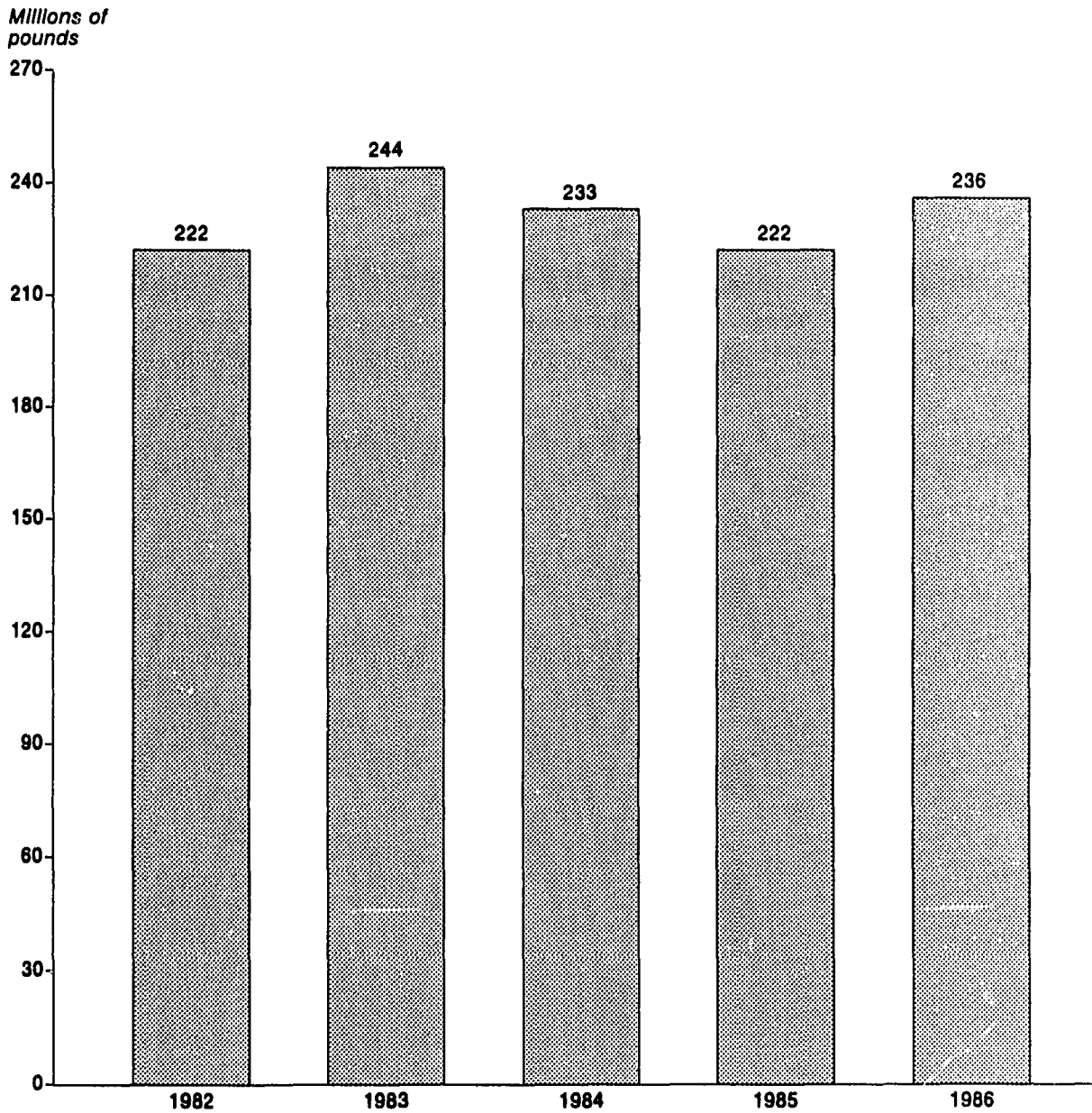
Total domestic production of dyes in 1986 amounted to 236 million pounds, or 5.9 percent more than the 222 million pounds produced in 1985 (table 12). Sales of dyes in 1986 amounted to 226 million pounds, valued at \$652 million, compared with 267 million pounds, valued at \$651 million, in 1985. In terms of both quantity and value, sales of dyes in 1986 was approximately equal to sales in 1985, despite the almost 6-percent increase in production. The average unit value of sales of all dyes in 1986 was \$2.89 per pound, compared with \$2.43 per pound in 1985.

Production of three classes of dyes decreased in 1986, while the remaining seven major classes registered slight to moderate increases in their production. Direct dyes increased by 34 percent from 29.7 million pounds in 1985 to 39.8 million pounds in 1986; fluorescent brighteners decreased by 13.6 percent to 50.1 million pounds in 1986 from 58.0 million pounds in 1985. Changes in U.S. production of synthetic dyes followed overall changes in U.S. economic activity during 1982-86 (see figure 5).

Table 13 lists the products reported in this section and indicates the manufacturer(s) of each by code. These codes are identified by company name in table 14.

SECTION 4. DYES

Figure 5
Dyes



Source: U.S. International Trade Commission, *Synthetic Organic Chemicals: United States Production and Sales*.

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SYNTHETIC ORGANIC CHEMICALS, 1986

Table 12

Dyes: U.S. production and sales, 1986

(Listed below are all dyes for which any reported data on production or sales may be published. (Leaders (...) are used where the reported data are accepted in confidence and may not be published or where no data were reported.) Table 13 lists all dyes for which data on production and/or sales were reported and identifies the manufacturers of each)

Dyes	Sales			
	Production 1,000 pounds	Quantity 1,000 pounds	Value 1,000 dollars	Unit value ¹ Per pound
Grand total	235,547	225,695	651,804	\$2.89
Acid dyes				
Total	21,210	19,492	84,203	4.32
Acid yellow dyes, total	2,896	2,775	8,811	1.18
Acid Yellow 17	37	83	549	6.61
Acid Yellow 23	113	94	398	4.25
Acid Yellow 151 .....	...	376	1,472	3.91
All other acid yellow dyes	2,746	2,222	6,392	2.88
Acid orange dyes, total	5,202	4,334	8,828	2.04
Acid Orange 8	84	97	228	2.34
Acid Orange 10	49	63	181	2.89
All other acid orange dyes	5,069	4,174	8,419	2.02
Acid red dyes, total	4,432	4,173	24,009	5.75
Acid Red 1	188	141	490	3.48
Acid Red 137	87	63	452	7.21
Acid Red 151 .....	...	137	455	3.33
Acid Red 182	384	315	1,719	5.46
All other acid red dyes	3,793	3,517	20,893	5.94
Acid violet dyes	82	115	892	7.80
Acid blue dyes total	5,759	5,292	29,984	5.67
Acid Blue 324	1,834	1,708	8,149	4.77
All other acid blue dyes	3,925	3,584	21,835	6.09
Acid green dyes	294	223	1,650	7.39
Acid brown dyes	301	346	1,624	4.69
Acid black dyes, total	2,244	2,234	8,405	3.76
Acid Black 1	358	313	845	2.70
Acid Black 52	624	636	1,760	2.77
All other acid black dyes	1,262	1,285	5,800	4.51
Basic dyes (classical and modified)				
Total	12,402	11,814	57,447	4.86
Basic yellow dyes	3,250	3,101	10,935	3.53
Basic orange dyes, total	949	872	2,829	3.02
Basic Orange 2	521	450	917	2.04
All other basic orange dyes	428	422	1,712	4.06

See footnotes at end of table.

SECTION 4. DYES

Table 12—Continued
Dyes: U.S. production and sales, 1986

<i>Dyes</i>	<i>Sales</i>			
	<i>Production</i>	<i>Quantity</i>	<i>Value</i>	<i>Unit value¹</i>
	<i>1,000 pounds</i>	<i>1,000 pounds</i>	<i>1,000 dollars</i>	<i>Per pound</i>
Basic dyes (classical and modified)—Continued				
Basic red dyes, total	1,664	1,709	7,336	\$4.29
Basic Red 12	230	229	1,319	5.76
Basic Red 15	440	470	1,415	3.01
All other basic red dyes	994	1,010	4,602	4.50
Basic violet dyes, total	3,327	3,200	10,880	3.49
Basic Violet 1	1,466	1,430	3,411	2.38
Basic Violet 3	1,041	917	3,231	3.52
All other basic violet dyes	820	853	4,238	4.97
Basic blue dyes	1,462	1,428	9,475	6.64
All other basic dyes	1,750	1,504	16,192	10.77
Direct dyes				
Total	39,816	34,225	83,192	2.43
Direct yellow dyes, total	17,506	13,506	24,236	1.79
Direct Yellow 4	975	986	1,716	1.74
Direct Yellow 127	1,326	1,093	2,245	2.05
All other direct yellow dyes	15,205	11,427	20,275	1.77
Direct orange dyes, total	1,692	1,578	3,922	2.49
Direct Orange 15	714	698	676	.97
Direct Orange 39	39	53	234	4.42
Direct Orange 102	690	568	1,879	3.31
All other direct oranges dyes	249	259	1,133	4.37
Direct red dyes, total	6,277	5,675	17,742	3.13
Direct Red 80	338	311	1,423	4.57
Direct Red 81	848	773	1,630	2.11
Direct Red 83	88	124	441	3.55
Direct Red 236	1,676	1,398	3,172	2.27
Direct Red 254	1,730	1,646	3,505	2.13
All other direct red dyes	1,597	1,423	7,571	5.32
Direct violet and green dyes	353	289	1,093	3.78
Direct blue dyes, total	6,980	6,666	20,417	3.06
Direct Blue 80	288	295	1,270	4.31
Direct Blue 86	942	912	2,280	2.50
Direct Blue 96	215	159	585	3.74
Direct Blue 199	840	773	1,820	2.35
Direct Blue 218 .....	...	1,146	3,666	2.94
All other direct blue dyes	4,695	3,384	10,796	3.19
Direct brown dyes	406	456	1,404	3.07

See footnotes at end of table.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 12—Continued
Dyes: U.S. production and sales, 1986

<i>Dyes</i>	<i>Sales</i>			
	<i>Production</i>	<i>Quantity</i>	<i>Value</i>	<i>Unit value¹</i>
	<i>1,000 pounds</i>	<i>1,000 pounds</i>	<i>1,000 dollars</i>	<i>Per pound</i>
Direct dyes—Continued				
Direct black dyes, total	6,602	6,055	14,378	\$2.37
Direct Black 22	1,827	1,496	2,914	1.95
Direct Black 80	838	869	1,916	2.20
All other direct black dyes	3,937	3,690	9,548	2.59
Disperse dyes				
Total	26,121	21,836	86,267	3.95
Disperse yellow dyes	2,470	1,628	6,010	3.69
Disperse orange dyes, total	3,961	2,993	7,716	2.58
Disperse Orange 25 and 25:1	342	228	539	2.37
Disperse Orange 30	1,865	1,511	3,435	2.27
Disperse Orange 37	302	232	489	2.10
Disperse Orange 44 and 44:1	539	168	568	3.38
All other disperse orange dyes	913	854	2,685	3.14
Disperse red dyes, total	5,164	4,425	23,091	5.22
Disperse Red 5 .....	...	61	154	2.55
Disperse Red 17 .....	...	74	207	2.80
Disperse Red 73	420	366	1,316	3.60
Disperse Red 177	506	414	1,597	3.86
All other disperse red dyes	4,238	3,510	19,817	5.65
Disperse violet dyes	281	232	1,659	7.13
Disperse blue dyes, total	12,081	10,507	38,992	3.71
Disperse Blue 3 .....	...	473	2,233	4.72
Disperse Blue 64 .....	...	129	591	4.59
Disperse Blue 79 ^a	5,387	4,643	7,465	1.01
All other disperse blue dyes	6,694	5,262	28,703	5.45
Disperse black, brown and green dyes, total	2,164	2,051	8,799	4.29
Disperse Brown 1	763	570	1,832	3.22
Disperse Black 9	1,235	1,315	4,354	3.31
All other disperse black, brown, and green dyes ..	166	166	2,613	15.74
Fiber-reactive dyes				
Total	11,243	11,050	75,068	6.79
Fluorescent brightening agents				
Total	50,132	55,333	63,145	1.14

See footnotes at end of table.

SECTION 4. DYES

Table 12—Continued
Dyes: U.S. production and sales, 1986

Dyes	Sales			
	Production	Quantity	Value	Unit value ¹
	1,000 pounds	1,000 pounds	1,000 dollars	Per pound
Food, drug, and cosmetic colors				
Total	6,877	6,241	56,526	\$9.06
Food, drug and cosmetic dyes, total				
FD&C Red No. 3 .....	...	304	4,524	14.89
FD&C Yellow No. 5	1,569	1,443	7,275	5.04
FD&C Yellow No. 6	1,528	1,331	5,759	4.33
All other food, drug, and cosmetic, dyes	3,431	2,830	32,317	11.42
Drug and cosmetic dyes, total				
D&C Red No. 6	49	56	732	13.10
D&C Red No. 30	6	17	648	39.13
D&C Red No. 33	5	6	222	34.99
D&C Yellow No. 10	59	63	2,153	33.98
All other drug and cosmetic dyes ²	230	191	2,896	15.16
Mordant dyes				
Total	328	330	1,297	3.93
Solvent dyes				
Total	8,843	5,521	30,513	5.53
Solvent yellow dyes	1,031	811	6,889	8.50
Solvent orange dyes	352	314	1,982	6.31
Solvent red dyes	2,173	1,747	11,096	6.35
Solvent blue dyes	2,963	515	4,967	9.64
All other solvent dyes	2,324	2,134	5,579	2.61
Vat dyes				
Total	39,147	40,890	76,226	1.86
Vat yellow dyes	55	138	1,070	7.78
Vat orange dyes	125	232	1,103	4.75
Vat red dyes	504	727	4,816	6.83
Vat blue dyes	37,138	37,017	56,374	1.52
Vat green dyes	309	608	2,220	3.65
Vat brown dyes	441	1,224	4,978	4.07
Vat black dyes	297	664	3,888	5.85
Vat violet dyes	278	280	1,777	6.34
All other dyes				
Total ⁴	19,428	18,963	37,920	2.00

¹ Calculated from unrounded figures.

² Several close chemical analogs are marketed as Disperse Blue 79 or Disperse Blue 79 similar products. All of these analogs are aggregated in the statistics under the heading Disperse Blue 79.

³ The data include external drug and cosmetic dyes.

⁴ The data include azolic compositions, azolic coupling components, azolic diazo components (bases and salts), sulfur dyes, and miscellaneous dyes. Statistics for those groups of dyes may not be published separately because publication would disclose information received in confidence.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 13

Dyes for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1986

(Chemicals for which separate statistics are given in table 12 are marked below with an asterisk (*); chemicals not so marked do not appear in table 12 because the reported data are accepted in confidence and may not be published. Manufacturers' identification codes shown below are taken from table 14. An "X" signifies that the manufacturer did not consent to his identification with the designated product)

Dyes	Manufacturers' identification codes (according to list in table 14)
Acid dyes	
*Acid yellow dyes:	
Acid Yellow 3	ACY.
*Acid Yellow 17	ATL, CGY, CK, SDH.
*Acid Yellow 23	BAS, CK, LVR, MRX, WJ.
Acid Yellow 3	ATL, FAB.
*Acid Yellow 36	ATL, CGY, VPC.
Acid Yellow 40	CGY.
*Acid Yellow 49	CK, FAB, S, VPC.
Acid Yellow 54	CGY.
Acid Yellow 59	BAS.
Acid Yellow 65	ATL.
Acid Yellow 73	SDH.
Acid Yellow 87	CK.
Acid Yellow 99	CGY.
Acid Yellow 119	BAS.
Acid Yellow 127	CK.
Acid Yellow 129	CGY, CK.
Acid Yellow 135	ICI.
*Acid Yellow 151	CGY, CK, S, VPC.
Acid Yellow 159	CGY, CK.
Acid Yellow 198	CK.
Acid Yellow 200	CK.
Acid Yellow 216	VPC.
Acid Yellow 219	CGY, CK, S.
Acid Yellow 226	BAS.
Acid Yellow 239	DGO.
All other acid yellow dyes	ATL, CK.
*Acid orange dyes:	
*Acid Orange 7	ATL, BAS, CK, VPC.
Acid Orange 8	ATL, CK.
*Acid Orange 10	ATL, BAS, CGY, CK.
*Acid Orange 24	CGY, CK, S.
Acid Orange 51	CGY.
Acid Orange 60	CGY, CK.
Acid Orange 64	ATL.
Acid Orange 69	ATL, FAB.
Acid Orange 86	CGY.
Acid Orange 89	BAS.
Acid Orange 116	CGY, CK.
Acid Orange 128	CK.
Acid Orange 152	CK.
*Acid Orange 156	CGY, CK, S, VPC.
Acid Orange 161	ATL.
All other acid orange dyes	CK, VPC.
*Acid red dyes:	
*Acid Red 1	ATL, BAS, CGY, CK, FAB.
Acid Red 4	ATL, CGY.
Acid Red 14	ATL, BAS, WJ.
Acid Red 18	ATL.
Acid Red 27	WJ.
Acid Red 57	CGY, CK.
*Acid Red 73	ATL, CK, PSC.
Acid Red 85	FAB.
Acid Red 87	SDH.
Acid Red 88	ATL, BAS, CGY, FAB.
Acid Red 97	ATL.
Acid Red 114	CGY, CK, VPC.
Acid Red 119	CK.
*Acid Red 137	BAS, CGY, CK, VPC.

SECTION 4. DYES

Table 13—Continued

Dyes for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1986

Dyes	Manufacturers' identification codes (according to list in table 14)
Acid dyes—Continued	
*Acid red dyes—Continued:	
*Acid Red 151	ATL, CGY, CK.
Acid Red 167	ATL, CGY.
Acid Red 174	CGY.
*Acid Red 182	VPC.
Acid Red 186	CGY.
Acid Red 194	CGY.
Acid Red 213	CGY.
Acid Red 226	BAS.
Acid Red 257	CGY.
Acid Red 266	CK, ICI, VPC.
Acid Red 296	BAS.
Acid Red 299	ATL, CK, VPC.
Acid Red 337	CK, S, VPC.
Acid Red 364	CK.
Acid Red 384	CK.
Acid Red 396	ICI.
*All other acid red dyes	ATL, CGY, CK, EKT.
*Acid violet dyes:	
Acid Violet 3	ATL, FAB.
Acid Violet 7	ATL, FAB.
Acid Violet 12	ATL, FAB.
Acid Violet 17	SDH.
Acid Violet 49	SDH.
*Acid blue dyes:	
Acid Blue 9	BAS, SDH, WJ.
Acid Blue 15	BAS.
Acid Blue 25	CGY, CK, VPC.
Acid Blue 27	ATL, FAB.
Acid Blue 29	FAB.
Acid Blue 40	CK, VPC.
Acid Blue 41	CK.
Acid Blue 45	BAS, CGY.
Acid Blue 67	BAS.
Acid Blue 80	CGY.
Acid Blue 92	FAB.
Acid Blue 104	ATL, BAS.
Acid Blue 113	CK.
Acid Blue 118	CGY.
*Acid Blue 145	ATL, CK, VPC.
Acid Blue 158, 158:1, and 158:2	CGY.
Acid Blue 231	CK.
Acid Blue 277	CGY.
Acid Blue 283	S.
Acid Blue 298	CK.
Acid Blue 321	ATL.
*Acid Blue 324	CK, S, VPC.
Acid Blue 330	ATL.
*All other acid blue dyes	BAS, CGY, CK, VPC, X.
*Acid green dyes:	
Acid Green 1	LVR.
Acid Green 3	WJ.
Acid Green 5	WJ.
Acid Green 9	LVR.
Acid Green 20	ATL, FAB.
Acid Green 25	ATL, CGY, CK.
Acid Green 70	CGY.
All other acid green dyes	CK.
*Acid brown dyes:	
*Acid Brown 14	ATL, CGY, CK, S.
Acid Brown 19	CK.
Acid Brown 24	FAB.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 13—Continued

Dyes for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1986

Dyes	Manufacturers' identification codes (according to list in table 14)
Acid dyes—Continued	
*Acid brown dyes—Continued:	
Acid Brown 50	BAS.
Acid Brown 97	BAS, FAB.
Acid Brown 98	CGY.
Acid Brown 147	CK.
Acid Brown 159	BAS.
Acid Brown 160	BAS.
Acid Brown 161	BAS.
Acid Brown 165	BAS.
Acid Brown 227	BAS.
Acid Brown 239	CGY, CK.
Acid Brown 264	BAS.
All other acid brown dyes	BAS, CK, FAB.
*Acid black dyes:	
*Acid Black 1	ATL, CGY, CK.
*Acid Black 52	CGY, CK, FAB, S.
Acid Black 58	CGY.
Acid Black 60	CGY, CK.
Acid Black 63	BAS.
Acid Black 92	FAB.
Acid Black 107	CGY, CK.
Acid Black 172	CGY, ICI.
Acid Black 194	BAS.
*All other acid black dyes	ATL, CGY, CK.
Azoic dyes and components	
Azoic compositions:	
Azoic yellow compositions:	
Azoic Yellow 1	BUC.
Azoic orange composition:	
All other azoic orange compositions	BUC.
Azoic red compositions:	
Azoic Red 1	ALL, BUC.
Azoic Red 2	BUC.
Azoic Red 6	BUC.
All other azoic red composition	ALL, BUC.
Azoic violet compositions:	
Azoic Violet 1	BUC.
All other azoic violet compositions	BUC.
Azoic blue compositions:	
Azoic Blue 3	BUC.
Azoic Blue 6	BAS.
Azoic brown composition:	
Azoic Brown 7	BUC.
Azoic Brown 9	BUC.
All other azoic brown compositions	BUC.
Azoic black composition:	
Azoic Black 4	BUC.
All other azoic black compositions	BUC.
Azoic diazo components, bases:	
Azoic Diazo Component 4, base	ALL.
Azoic Diazo Component 5, base	ALL.
Azoic Diazo Component 13, base	ALL.
Azoic Diazo Component 14, base	ALL.
Azoic Diazo Component 32, base	ALL.
Azoic diazo components, salts:	
Azoic Diazo Component 1, salt	ALL.
Azoic Diazo Component 3, salt	ALL.
Azoic Diazo Component 5, salt	ALL.
Azoic Diazo Component 8, salt	ALL.
Azoic Diazo Component 9, salt	ALL.

SECTION 4. DYES

Table 13—Continued

Dyes for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Dyes	Manufacturers' identification codes (according to list in table 14)
Azolic dyes and components—Continued	
Azolic diazo components, salts—Continued	
Azolic Diazo Component 10, salt	ALL, ATL.
Azolic Diazo Component 11, salt	ALL.
Azolic Diazo Component 12, salt	ALL.
Azolic Diazo Component 13, salt	ALL.
Azolic Diazo Component 14, salt	ALL.
Azolic Diazo Component 20, salt	ATL.
Azolic Diazo Component 32, salt	ALL.
Azolic Diazo Component 34, salt	ALL.
Azolic Diazo Component 35, salt	ALL.
Azolic Diazo Component 42, salt	ALL.
Azolic Diazo Component 48, salt	ATL.
Azolic Diazo Component 49, salt	ALL.
All other azolic diazo components salts	ALL.
Azolic coupling components:	
Azolic Coupling Component 3	PCW.
Azolic Coupling Component 4	ALL.
Azolic Coupling Component 7	PCW.
Azolic Coupling Component 12	PCW.
Azolic Coupling Component 21	PCW.
Azolic Coupling Component 29	PCW.
Azolic Coupling Component 35	PCW.
Azolic Coupling Component 43	ALL.
Basic dyes (classical and modified)	
*Basic yellow dyes:	
Basic Yellow 2	ACY.
Basic Yellow 11	ATL, CK, VPC.
Basic Yellow 13	ATL, VPC.
Basic Yellow 15	CK.
Basic Yellow 24	BAS.
Basic Yellow 25	BAS.
Basic Yellow 28	BAS.
Basic Yellow 29	BAS, CK, VPC.
Basic Yellow 37	ACY.
Basic Yellow 49	BAS.
Basic Yellow 53	CK.
Basic Yellow 58	VPC.
Basic Yellow 65	BAS.
Basic Yellow 78	ACY.
Basic Yellow 79	CK.
Basic Yellow 83	CK.
Basic Yellow 96	BAS.
All other basic yellow dyes	X.
All other basic yellow dyes modified	CGY, CK.
*Basic orange dyes:	
Basic Orange 1	CK, PSC.
*Basic Orange 2	ATL, CGY, CK, PSC.
Basic Orange 21	ATL, VPC.
All other basic orange dyes	X.
All other basic orange dyes, modified	VPC.
*Basic red dyes:	
*Basic Red 12	ACY, ATL, VPC.
Basic Red 14	BAS, VPC.
*Basic Red 15	ATL, BAS, CK.
Basic Red 17	CK.
Basic Red 22	CGY.
Basic Red 29	BAS.
Basic Red 46	CK.
Basic Red 49	BAS, CK.
Basic Red 51	BAS.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 13—Continued

Dyes for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1986

<i>Dyes</i>	<i>Manufacturers' identification codes (according to list in table 14)</i>
Basic dyes (classical and modified)—Continued	
*Basic red dyes—Continued:	
Basic Red 54	BAS.
Basic Red 73	CK.
Basic Red 104	CK.
Basic Red 111	S.
All other basic red dyes	CGY, X.
All other basic red dyes modified	VPC.
*Basic violet dyes:	
*Basic Violet 1	ACY, BAS, BCC, DSC.
*Basic Violet 3	ACY, BAS, CK, DSC.
Basic Violet 4	ACY, DSC.
Basic Violet 10	ACY, BAS.
Basic Violet 16	BAS, VPC.
Basic Violet 35	BAS.
All other basic violet dyes	X.
*Basic blue dyes:	
Basic Blue 1	ACY, SHC, VPC.
Basic Blue 3	BAS, CK, VPC.
Basic Blue 7	DSC.
Basic Blue 21	CK.
Basic Blue 28	DSC.
Basic Blue 41	BAS, VPC.
Basic Blue 54	BAS.
Basic Blue 60	BAS.
Basic Blue 77	VPC.
Basic Blue 94 and 94:1	CK.
Basic Blue 140	VPC.
All other basic blue dyes	CGY, X.
All other basic blue dyes, modified	BAS, CK, VPC.
Basic green dyes:	
Basic Green 1	DSC.
Basic Green 4	ACY, BAS, DSC.
All other basic green dyes	X.
Basic brown dyes:	
Basic Brown 1	CGY, PSC.
Basic Brown 4	ATL, CGY, PSC.
All other basic brown dyes	BAS.
Basic black dyes:	
All other basic black dyes	BAS, CGY, X.
All other basic black dyes, modified	CK, VPC.
Direct dyes	
*Direct yellow dyes:	
*Direct Yellow 4	ATL, BAS, CGY, CK, VPC.
Direct Yellow 5	ACY, BAS.
Direct Yellow 6	CGY, VPC.
Direct Yellow 11	BAS, VPC.
Direct Yellow 28	ATL, CK.
Direct Yellow 34	CGY, CK.
Direct Yellow 44	CGY, CK.
Direct Yellow 50	CGY.
Direct Yellow 51	S.
Direct Yellow 105	CGY.
Direct Yellow 106	CGY, CK.
Direct Yellow 107	CGY, CK.
Direct Yellow 118	CGY, CK.
Direct Yellow 119	VPC.
Direct Yellow 127	BAS, CGY, CK, VPC.
Direct Yellow 131	VPC.
Direct Yellow 132	S.
Direct Yellow 133	S.

SECTION 4. DYES

Table 13—Continued

Dyes for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

<i>Dyes</i>	<i>Manufacturers' identification codes (according to list in table 14)</i>
Direct dyes—Continued	
*Direct yellow dyes—Continued	
Direct Yellow 137	VPC.
Direct Yellow 147	BAS, VPC.
Direct Yellow 148	S.
Direct Yellow 150	S.
Direct Yellow 152	S.
*All other direct yellow dyes	ATL, BAS, CGY, CK.
*Direct orange dyes:	
Direct Orange 6	ATL.
*Direct Orange 15	BAS, CGY, FAB, VPC.
Direct Orange 26	CK.
Direct Orange 29	CGY.
Direct Orange 34	ATL, FAB.
Direct Orange 39	CGY, CK, FAB.
Direct Orange 72	ATL, CGY, CK.
Direct Orange 80	ATL.
*Direct Orange 102	ATL, BAS, CGY, VPC.
Direct Orange 118	S.
*All other direct orange dyes	ATL, BAS, CGY.
*Direct red dyes:	
Direct Red 2	ATL, FAB.
Direct Red 4	CK.
Direct Red 9	CK.
Direct Red 16	ATL, CGY.
Direct Red 24	ATL, FAB.
Direct Red 26	ATL, CGY.
Direct Red 28	FAB.
Direct Red 31	ATL.
*Direct Red 72	ATL, BAS, CGY, CK.
Direct Red 73	ATL, CGY.
Direct Red 79	CK.
Direct Red 80	ATL, CGY, CK.
*Direct Red 81	ATL, CGY, CK, LVR, VPC.
*Direct Red 83	ATL, CGY, CK, FAB.
Direct Red 149	ATL.
Direct Red 153	ATL.
*Direct Red 238	BAS, CGY, CK, VPC.
Direct Red 238	VPC.
Direct Red 239	CGY, S.
*Direct Red 254	BAS, CGY, VPC.
*All other direct red dyes	ACY, ATL, CK, VPC.
Direct violet dyes:	
Direct Violet 9	ATL, CGY.
Direct Violet 66	ATL.
Direct Violet 99	VPC.
*Direct blue dyes:	
Direct Blue 1	ATL.
Direct Blue 2	FAB.
Direct Blue 8	ATL.
Direct Blue 15	ATL, S, VPC.
Direct Blue 25	CK.
Direct Blue 67	ATL.
Direct Blue 71	CK.
*Direct Blue 75	CGY, CK, S.
Direct Blue 76	BAS, CK.
Direct Blue 79	S.
*Direct Blue 80	ATL, BAS, CGY, CK, FAB.
*Direct Blue 86	ATL, CGY, CK, S, VPC.
Direct Blue 98	ATL, CK, FAB.
Direct Blue 100	FAB.
Direct Blue 108	ATL.
Direct Blue 120, 120:1, 120:2, and 120:3	FAB.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 13—Continued

Dyes for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1986

<i>Dyes</i>	<i>Manufacturers' identification codes (according to list in table 14)</i>
Direct dyes—Continued	
*Direct blue dyes—Continued	
Direct Blue 160	CGY, CK.
Direct Blue 189	CGY, CK.
Direct Blue 191	CK.
*Direct Blue 199	BAS, CGY, VPC.
*Direct Blue 218	CGY, CK, FAB, VPC.
Direct Blue 261	S.
Direct Blue 267	S.
Direct Blue 269	VPC.
Direct Blue 279	VPC.
Direct Blue 280	ATL.
Direct Blue 281	CGY.
Direct Blue 283	ATL.
Direct Blue 286	ATL.
*All other direct blue dyes	BAS, CGY, CK, FAB, VPC.
Direct green dyes:	
Direct Green 92	ATL.
All other direct green dyes	FAB.
*Direct brown dyes:	
Direct Brown 2	FAB.
Direct Brown 31	FAB.
Direct Brown 44	FAB.
Direct Brown 154	FAB.
Direct Brown 229	ATL.
Direct Brown 230	ATL.
Direct Brown 231	ATL.
Direct Brown 232	ATL.
Direct Brown 238	ATL.
All other direct brown dyes	BAS, CK, FAB.
*Direct black dyes:	
Direct Black 4	FAB.
Direct Black 19	ATL, CGY.
*Direct Black 22	ATL, CGY, CK, FAB, VPC.
*Direct Black 80	ATL, CGY, CK, FAB.
Direct Black 91	CGY.
Direct Black 165	ATL.
Direct Black 170	ATL.
Direct Black 190	FAB.
*All other direct black dyes	ATL, CGY, CK, FAB, VPC.
Disperse dyes	
*Disperse yellow dyes:	
Disperse Yellow 3	CGY, CK.
Disperse Yellow 23	CGY, CK, S.
Disperse Yellow 34	EKT.
Disperse Yellow 42	CGY, SDC.
Disperse Yellow 54	BAS, CGY, VPC.
Disperse Yellow 64	CGY.
Disperse Yellow 67	CGY.
Disperse Yellow 77	VPC.
Disperse Yellow 86	EKT.
Disperse Yellow 88	EKT.
Disperse Yellow 108	EKT.
Disperse Yellow 125	SDC.
Disperse Yellow 126	ICI.
Disperse Yellow 198	BAS.
Disperse Yellow 200	EKT.
Disperse Yellow 210	S.
Disperse Yellow 219	S, SDC.
All other disperse yellow dyes	BAS, CK, ICI, VPC.

SECTION 4. DYES

Table 13—Continued

Dyes for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1986

<i>Dyes</i>	<i>Manufacturers' identification codes (according to list in table 14)</i>
Disperse dyes—Continued	
*Disperse orange dyes:	
Disperse Orange 3	CK.
Disperse Orange	ATL.
Disperse Orange 17	ATL.
*Disperse Orange 25 and 25:1	ATL, CK, EKT, ICI, VPC.
Disperse Orange 29	ATL, CK, S.
*Disperse Orange 30	ATL, BUC, CGY, CK, S.
*Disperse Orange 37	ATL, CGY, CK, EKT.
Disperse Orange 41	CGY, S.
*Disperse Orange 44 and 44:1	CGY, CK, S, SDC.
Disperse Orange 73	BAS.
Disperse Orange 88	SDC.
Disperse Orange 89	CK.
Disperse Orange 94	S, SDC.
Disperse Orange 129	SDC.
Disperse Orange 136	EKT.
Disperse Orange 138	EKT.
Disperse Orange 145	EKT.
All other disperse orange dyes	CGY, CK, SDC.
*Disperse red dyes:	
*Disperse Red 1	ATL, CK.
*Disperse Red 5	ATL, CGY, CK.
Disperse Red 9	CGY.
Disperse Red 13	ATL.
Disperse Red 15	CGY.
Disperse Red 17	ATL, CGY, CK.
Disperse Red 22	MRT.
Disperse Red 30	CGY, EKT.
Disperse Red 35	EKT.
Disperse Red 40	VPC.
Disperse Red 50	CGY, CK.
Disperse Red 55	BAS, CGY, VPC.
Disperse Red 60	BAS, CGY, VPC.
Disperse Red 65	CGY, CK.
*Disperse Red 73	ATL, CK, ICI, S.
Disperse Red 74	S.
Disperse Red 82	CGY, VPC.
Disperse Red 88	EKT.
Disperse Red 91	BAS.
Disperse Red 117	EKT.
Disperse Red 128	CGY.
*Disperse Red 133	CGY, EKT, VPC.
Disperse Red 135	CGY, CK.
Disperse Red 136	EKT.
Disperse Red 137	EKT.
Disperse Red 153	FAB, S, SDC.
Disperse Red 159	VPC.
Disperse Red 167 and 167:1	BAS, CGY, CK, S.
*Disperse Red 177	CK, ICI, S, SDC, VPC.
*Disperse Red 179	BAS, CGY, CK, S.
Disperse Red 195	S, SDC.
Disperse Red 207	CGY.
Disperse Red 263	BAS.
Disperse Red 274	S, SDC.
Disperse Red 278	ICI.
Disperse Red 305	EKT.
Disperse Red 307	EKT.
Disperse Red 309	EKT.
Disperse Red 311	ICI.
Disperse Red 313	S, SDC.
Disperse Red 316	S.
Disperse Red 319	CK.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 13—Continued

Dyes for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1986

Dyes	Manufacturers' identification codes (according to list in table 14)
Disperse dyes—Continued	
*Disperse red dyes—Continued	
Disperse Red 325	CGY, CK.
Disperse Red 333	S, SDC.
Disperse Red 338	EKT.
Disperse Red 339	EKT.
Disperse Red 340	EKT.
Disperse Red 341	EKT.
Disperse Red 345	CK.
Disperse Red 364	CK.
All other disperse red dyes	BAS, CGY, CK, EKT, VPC.
*Disperse violet dyes:	
Disperse Violet 1	CK.
Disperse Violet 28	CK.
Disperse Violet 33	ICI, S.
Disperse Violet 36	S, SDC.
Disperse Violet 60	S, SDC.
All other disperse violet dyes	CGY.
*Disperse blue dyes:	
*Disperse Blue 3	CGY, CK, EKT.
Disperse Blue 7	CGY.
Disperse Blue 26	VPC.
Disperse Blue 27	EKT.
Disperse Blue 56	S, VPC.
Disperse Blue 60	BAS, CGY, VPC.
Disperse Blue 62	EKT.
*Disperse Blue 64	CGY, EKT, S.
Disperse Blue 72	BAS.
Disperse Blue 73	S.
Disperse Blue 77	EKT.
*Disperse Blue 79	ATL, BAS, CGY, EKT, HST, ICI, S, SDC, STC, VPC.
Disperse Blue 81	VPC.
Disperse Blue 95	HST.
Disperse Blue 102	CK, EKT.
Disperse Blue 118	EKT.
Disperse Blue 122	ICI.
Disperse Blue 148	BAS.
Disperse Blue 165	CGY, VPC.
Disperse Blue 200	ICI.
Disperse Blue 281	CGY, S, SDC.
Disperse Blue 284	ICI.
Disperse Blue 291	S, SDC.
Disperse Blue 337	EKT.
Disperse Blue 338	EKT.
*All other disperse blue dyes	BAS, CGY, CK, EKT, ICI, VPC.
Disperse green dyes:	
Disperse Green 9	ICI.
All other disperse green dyes	CGY, CK.
Disperse brown dyes:	
*Disperse Brown 1	ATL, CK, ICI, S, SDC.
Disperse Brown 2	CK, SDC.
Disperse Brown 18	S, SDC.
Disperse Brown 22	EKT.
All other disperse brown dyes	CK, EKT, ICI.
Disperse black dyes	
Disperse Black 1	CGY.
*Disperse Black 9	ATL, CGY, EKT.
Disperse Black 33	CGY.
*All other disperse black dyes	BAS, CK, EKT, VPC.

SECTION 4. DYES

Table 13—Continued

Dyes for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1956

Dyes	Manufacturers' identification codes (according to list in table 14)
Fiber-reactive dyes	
Reactive yellow dyes:	
Reactive Yellow 6	CGY.
Reactive Yellow 7	ICI.
Reactive Yellow 15	HST.
Reactive Yellow 17	HST.
Reactive Yellow 18	ICI.
Reactive Yellow 22	ICI.
Reactive Yellow 37	HST.
Reactive Yellow 42	HST.
Reactive Yellow 57	HST.
Reactive Yellow 86	ICI.
Reactive Yellow 133	ICI.
Reactive Yellow 135	ICI.
Reactive Yellow 160	HST.
All other reactive yellow dyes	HST, ICI, STC.
Reactive orange dyes:	
Reactive Orange 1	ICI.
Reactive Orange 4	ICI.
Reactive Orange 12	ICI.
Reactive Orange 13	ICI.
Reactive Orange 14	ICI.
Reactive Orange 16	ATL, CK, HST.
Reactive Orange 20	CK.
Reactive Orange 78	HST.
Reactive Orange 84	ICI.
Reactive Orange 86	ICI.
All other reactive orange dyes	ICI.
Reactive red dyes:	
Reactive Red 2	CK, ICI.
Reactive Red 11	CK, ICI.
Reactive Red 21	HST, STC.
Reactive Red 29	ICI.
Reactive Red 31	ICI.
Reactive Red 33	ICI.
Reactive Red 43	CK.
Reactive Red 49	HST, STC.
Reactive Red 94	HST.
Reactive Red 120	CK, ICI.
Reactive Red 123	VPC.
Reactive Red 141	ICI.
Reactive Red 160	HST.
Reactive Red 180	HST.
All other reactive red dyes	HST, ICI.
Reactive violet dyes	
Reactive Violet 5	HST, STC.
All other reactive violet dyes	HST, ICI.
Reactive blue dyes:	
Reactive Blue 3	ICI.
Reactive Blue 4	CK, ICI.
Reactive Blue 5	ICI.
Reactive Blue 7	CGY.
Reactive Blue 13	ICI.
Reactive Blue 19	HST.
Reactive Blue 21	HST.
Reactive Blue 38	HST, STC.
Reactive Blue 71	ICI.
Reactive Blue 89	HST, ICI.
Reactive Blue 173	ICI.
Reactive Blue 174	ICI.
Reactive Blue 199	ICI.
Reactive Blue 203	HST.
All other reactive blue dyes	HST, ICI, S, STC.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 13—Continued

Dyes for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1986

Dyes	Manufacturers' identification codes (according to list in table 14)
Fiber reactive dyes—Continued	
Reactive green dyes:	
Reactive Green 12	S.
Reactive Green 19	ICI.
All other reactive green dyes	HST.
Reactive brown dyes:	
Reactive Brown 1	ICI.
Reactive Brown 17	ICI.
Reactive Brown 18	HST.
Reactive black dyes:	
Reactive Black 5	ATL, CK, HST, STC.
Reactive Black 9	ICI.
Fluorescent brighteners	
Fluorescent Brightener 22	CGY.
Fluorescent Brightener 24	CGY.
Fluorescent Brightener 28	CGY, SDH.
Fluorescent Brightener 46	CGY.
Fluorescent Brightener 49	S.
Fluorescent Brightener 52	S.
Fluorescent Brightener 61	ACY.
Fluorescent Brightener 71	CGY.
Fluorescent Brightener 102	CGY.
Fluorescent Brightener 128	SDH.
Fluorescent Brightener 134	CGY.
Fluorescent Brightener 290	S.
All other fluorescent brighteners	ACY, CGY, S, X.
Food drug, and cosmetic colors	
*Food, drug, and cosmetic dyes:	
Food, Drug, and Cosmetic Blue 1	KON, SDH, WJ.
Food, Drug, and Cosmetic Blue 2	KON, SDH, WJ
Food, Drug, and Cosmetic Green 3	WJ.
*Food, Drug, and Cosmetic Red 3	KON, SDH, STG, WJ.
Food, Drug, and Cosmetic Red 4	CK, WJ.
Food, Drug, and Cosmetic Red 40	KON, SDH, STG, WJ.
*Food, Drug, and Cosmetic Yellow 5	KON, MRX, STG, WJ.
Food, Drug, and Cosmetic Yellow 6	CK, KON, SDH, STG, WJ.
*Drug and cosmetic dye	
Drug and Cosmetic Green 5	CK, KON.
Drug and Cosmetic Green 6	KON.
Drug and Cosmetic Green 8	SDH.
Drug and Cosmetic Orange 4	KON.
Drug and Cosmetic Orange 5	SDH, SNA, TMS.
Drug and Cosmetic Orange 17	SNA.
*Drug and Cosmetic Red 6	KON, MRX, SDH, SNA, TMS.
*Drug and Cosmetic Red 7	KON, MRX, SDH, SNA, TMS.
Drug and Cosmetic Red 8	MRX.
Drug and Cosmetic Red 9	SNA.
Drug and Cosmetic Red 17	KON.
Drug and Cosmetic Red 19	SNA.
Drug and Cosmetic Red 21	KON, SNA.
Drug and Cosmetic Red 22	SDH, WJ.
*Drug and Cosmetic Red 27	MRX, SDH, SNA, TMS.
Drug and Cosmetic Red 28	SDH.
Drug and Cosmetic Red 30	KON, MRX, SNA, WJ.
*Drug and Cosmetic Red 33	CK, KON, SNA, WJ.
Drug and Cosmetic Red 34	KON, SNA.
Drug and Cosmetic Red 36	SDH, SNA, TMS, WJ.
Drug and Cosmetic Yellow 5	KON.
Drug and Cosmetic Yellow 6	KON.

SECTION 4. DYES

Table 13—Continued

Dyes for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1986

<i>Dyes</i>	<i>Manufacturers' identification codes (according to list in table 14)</i>
Food drug, and cosmetic colors	
*Drug, and cosmetic dyes—Continued	
Drug and Cosmetic Yellow 8	KON.
*Drug and Cosmetic Yellow 10	CK, KON, SDH, WJ.
*Drug and cosmetic dyes, external:	
External Drug and Cosmetic Orange 3	CK, KON.
External Drug and Cosmetic Yellow 7	KON.
Mordant dyes	
Mordant yellow dyes:	
Mordant Yellow 1	FAB.
Mordant Yellow 8	FAB.
Mordant Yellow 20	FAB.
Mordant orange dyes:	
Mordant Orange 1	FAB.
Mordant Orange 6	ATL.
Mordant red dyes:	
Mordant Red 7	ATL.
Mordant Red 9	MRX.
Mordant Red 11	VPC.
Mordant brown dyes:	
Mordant Brown 1	ATL, FAB.
Mordant Brown 18	FAB.
Mordant Brown 40	FAB.
Mordant Brown 70	FAB.
Mordant black dyes:	
Mordant Black 9	ATL.
Mordant Black 11	CGY.
Solvent dyes	
*Solvent yellow dyes:	
Solvent Yellow 3	PSC.
Solvent Yellow 13	FAB.
Solvent Yellow 14	ATL, PSC.
Solvent Yellow 16	PSC.
Solvent Yellow 33	ACY, CIC.
Solvent Yellow 42	ATL, CK.
Solvent Yellow 43	DGO, MRT.
Solvent Yellow 44	DGO.
Solvent Yellow 47	ATL.
Solvent Yellow 56	PSC.
Solvent Yellow 72	PSC.
Solvent Yellow 94	SDH.
Solvent Yellow 107	MRT.
Solvent Yellow 131	DGO.
Solvent Yellow 135	X.
Solvent Yellow 143	MRT.
Solvent Yellow 160	X.
Solvent Yellow 161	MRT.
Solvent Yellow 163	MRT.
All other solvent yellow dyes	CIC, CK, MIL, MRT.
*Solvent orange dyes:	
Solvent Orange 2	ATL, PSC.
Solvent Orange 3	ATL, PSC.
Solvent Orange 7	PSC.
Solvent Orange 20	ATL, FAB.
Solvent Orange 23	CK.
Solvent Orange 25	MRT.
Solvent Orange 31	PSC.
Solvent Orange 60	CIC.
Solvent Orange 74	MRT.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 13—Continued

Dyes for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1986

<i>Dyes</i>	<i>Manufacturers' identification codes (according to list in table 14)</i>
Solvent dyes—Continued	
*Solvent orange dyes—Continued:	
Solvent Orange 76	MRT.
Solvent Orange 77	MRT.
Solvent Orange 97	MRT.
All other solvent orange dyes	MIL.
*Solvent red dyes:	
Solvent Red 1	ATL, PSC.
Solvent Red 22	BAS.
Solvent Red 23	PSC.
Solvent Red 24	ATL, PSC.
Solvent Red 26	PSC.
Solvent Red 27	PSC.
Solvent Red 49	ACY.
Solvent Red 68	ATL, CK, MRT.
Solvent Red 74	ATL.
Solvent Red 111	MRT.
Solvent Red 125	CK.
Solvent Red 164	MRT.
Solvent Red 165	MRT.
Solvent Red 166	MRT.
Solvent Red 168	MRT.
Solvent Red 169	MRT.
Solvent Red 172	MRT.
Solvent Red 175	MRT.
Solvent Red 207	MRT.
Solvent Red 208	MRT.
Solvent Red 209	MRT.
Solvent Red 210	MRT.
Solvent Red 222	CIC.
All other solvent red dyes	MIL.
Solvent violet dyes:	
Solvent Violet 8	DSC.
Solvent Violet 9	DSC, MRT.
Solvent Violet 13	CK.
Solvent Violet 14	MRT.
All other solvent violet dyes	MIL.
*Solvent blue dyes:	
Solvent Blue 3	PSG.
Solvent Blue 4	DSC.
Solvent Blue 5	DSC.
Solvent Blue 23	BAS.
Solvent Blue 35	MRT.
Solvent Blue 36	MRT.
Solvent Blue 38	TNI.
Solvent Blue 58	MRT, VPC(E).
Solvent Blue 59	VPC.
Solvent Blue 98	MRT.
Solvent Blue 99	MRT.
Solvent Blue 100	MRT.
Solvent Blue 102	MRT.
Solvent Blue 128	MRT.
Solvent Blue 129	MRT.
All other solvent blue dyes	CK, MIL.
Solvent green dyes:	
Solvent Green 1	DSC.
Solvent brown dyes:	
Solvent Brown 12	PSC.
Solvent Brown 20	ATL.
Solvent Brown 22	PSC.
Solvent Brown 38	FAB.
Solvent Brown 52	MRT.

SECTION 4. DYES

Table 13—Continued

Dyes for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1986

Dyes	Manufacturers' identification codes (according to list in table 14)
Solvent dyes—Continued	
Solvent black dyes:	
Solvent Black 7	OCC, PSC.
Solvent Black 13	CK.
Solvent Black 26	ATL, FAB.
Solvent Black 46	MRT.
Solvent Black 48	MRT.
Solvent Black 49	MRT.
Sulfur dyes	
Sulfur yellow dyes:	
Leuco Sulfur Yellow 17	SDC.
Leuco Sulfur Yellow 21	SDC.
Leuco Sulfur Yellow 22	SDC.
Sulfur orange dyes:	
Sulfur Orange 1	SDC.
Sulfur red dyes:	
Leuco Sulfur Red 14	SDC.
Sulfur Red 10	SDC.
Sulfur blue dyes:	
Leuco Sulfur Blue 7	SDC.
Leuco Sulfur Blue 11	SDC, VPC(E).
All other sulfur blue dyes	VPC.
Sulfur green dyes:	
Leuco Sulfur Green 3	SDC
Leuco Sulfur Green 16	SDC.
Leuco Sulfur Green 35	SDC.
Leuco Sulfur Green 36	SDC.
Sulfur brown dyes:	
Leuco Sulfur Brown 1, 1:1	SDC.
Leuco Sulfur Brown 3	SDC.
Leuco Sulfur Brown 10	SDC.
Leuco Sulfur Brown 37	SDC.
Leuco Sulfur Brown 52	SDC.
Leuco Sulfur Brown 95	SDC.
All other sulfur brown dyes	SDC.
Sulfur black dyes:	
Leuco Sulfur Black 1	SDC.
Leuco Sulfur Black 2	SDC.
Leuco Sulfur Black 18	SDC.
Solubilized Sulfur Black 2	SDC.
Sulfur Black 11, 11:1	SDC.
All other sulfur black dyes	VPC.
Vat dyes	
*Vat yellow dyes:	
Vat Yellow 22, 10%	VPC.
Vat Yellow 33, 15%	CGY.
All other vat Yellow dyes	SDC.
*Vat orange dyes:	
Vat Orange 1, 20%	CGY, SDC.
Vat Orange 2, 12%	BAS, CGY.
Vat Orange 7, 11%	CGY.
All other vat orange dyes	CGY.
*Vat red dyes:	
Vat Red 1, 13%	ACY.
Vat Red 10, 18%	BAS.
Vat Red 13, 11%	CGY, SDC.
Vat Red 15, 10%	HST.
Vat Red 32, 20%	VPC.
All other vat red dyes	HST.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 13—Continued

Dyes for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1986

<i>Dyes</i>	<i>Manufacturers' identification codes (according to list in table 14)</i>
Vat dyes—Continued	
Vat violet dyes:	
Vat Violet 13, 6-1/4%	BAS, CGY.
*Vat blue dyes:	
Vat Blue 1, 20%	BAS, BCC, PSC.
Vat Blue 6, 8-1/3%	BAS, CGY, SDC.
Vat Blue 16, 16%	BAS, CGY.
Vat Blue 18, 13%	CGY.
Vat Blue 19	BAS.
Vat Blue 20, 14%	CGY.
Vat Blue 29	BAS.
Vat Blue 43	SDC.
Vat Blue 66	BAS.
All other vat blue dyes	BAS
*Vat green dyes:	
Vat Green 1, 6%	BAS, CGY.
Vat Green 3, 10%	BAS, CGY.
Vat Green 7	SDC.
Vat Green 9, 12-1/2%	CGY.
All other vat green dyes	CGY.
*Vat brown dyes:	
Vat Brown 1, 11%	CGY.
Vat Brown 3, 11%	CGY.
Vat Brown 11, 12%	CGY.
Vat Brown 13, 17%	CGY.
Vat Brown 57, 12.8%	CGY.
All other vat brown dyes	CGY, HST.
*Vat black dyes:	
Vat Black 16	CGY.
Vat Black 22, 19%	CGY, SDC.
Vat Black 25, 12-1/2%	BAS, CGY, SDC.
Vat Black 27, 12-1/2%	CGY.
All other vat black dyes	CGY.
Miscellaneous dyes	
*All other dyes	DAN, MIL, MRT.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

SECTION 4. DYES

Table 14

Dyes alphabetical directory of manufacturers, by codes, 1986

(Names of manufacturers that reported production and/or sales of dyes to the U.S. International Trade Commission for 1986 are listed below in the order of their identification codes as used in table 13)

<i>Code</i>	<i>Name of company</i>	<i>Code</i>	<i>Name of company</i>
ACY	American Cyanamid Co.	LVR	C. Lever Co., Inc.
ALL	Alliance Chemical, Inc.	MRX	Johnson Mattney, Inc., Pigments Dept.
ATL	Atlantic Industries, Inc.	MIL	Milliken & Co., Milliken Chemical Co.
BAS	BASF Corp.	MRT	Morton-Thiokol, Inc., Morton Chemical Div.
BCC	Buffalo Color Corp.	OCC	Orient Chemical Corp.
BUC	Synalloy Corp., Blackman Uhler Chemical Div.	PCW	Pfister Chemical, Inc.
CGY	Ciba-Geigy Corp.	PSC	Passaic Color & Chemical Co.
CIC	Color Chem International Corp.	PSG	PMC Specialties Group, Inc.
CK	Crompton & Knowles Corp.	S	Sandoz, Inc., Colors & Chemicals Div.
DAN	Dan River, Inc., Chemical Products Div.	SDC	Sandoz Chemical Corp.
DGO	Day-Glo Color Corp.	SDH	Sterling Drug Inc. SDI Divestiture Corp.
DSC	Dye Specialties, Inc.	SNA	Sun Chemical Corp., Pigments Div.
EKT	Eastman Kodak Co., Tennessee Eastman Co. Div.	STC	American Hoechst Corp., Sou-Tex Works
FAB	Fabricolor Manufacturing Corp.	STG	McCormick & Co., Inc., McCormick/Strange Flavor Div.
HST	American Hoechst Corp., Specialty Products Group, Rhode Island Works	TMS	Sterling Drug, Inc., SDI Divestiture Corp.
ICI	ICI Americas, Inc., Chemical Div.	TNI	Gillette Co., Chemical Div.
KON	H. Kohnstamm & Co., Inc.	VPC	Mobay Chemical Corp., Dyes & Pigments Div.
		WJ	Warner-Jenkinson Co.

Note.—Complete names, telephone numbers, and addresses of the above reporting companies are listed in app. A.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

SYNTHETIC ORGANIC CHEMICALS, 1986

SECTION 5. ORGANIC PIGMENTS

Stephen Wanser

202-523-0496

Organic pigments are toners and lakes¹ derived in whole or in part from benzenoid chemicals and colors.

Statistics on production and sales of all organic pigments in 1986 are given in table 15. Individual toners and lakes are identified in this report by the names used in the third edition of the *Colour Index*.

Total production of organic pigments in 1986 was 88.5 million pounds—9.4 percent more than the 80.9 million pounds produced in 1985. Total sales of organic pigments in 1986 amounted to 76.7 million pounds, valued at \$513.1 million, compared with 69.0 million pounds, valued at \$447.7 million, in 1985. In terms of quantity, sales of organic pigments in 1986 were 11.2 percent higher than in 1985; in terms of value, sales in 1986 were 14.6 percent higher than in 1985. Changes in U.S. production of pigment has followed overall changes in U.S. economic activity during 1982-86 (see figure 6).

Production of toners in 1986 amounted to 87.8 million pounds—9.3 percent more than the 80.3 million pounds reported in 1985. Sales in 1986 were 76.2 million pounds, valued at \$509.1 million, compared with 68.5 million pounds valued at \$440.8 million, in 1985. Sales in 1986 were 11.2 percent higher than those in 1985 in terms of quantity, and 15.5 percent higher in terms of value. The individual toners listed in the report which were produced in the largest quantities in 1986 were Pigment Yellow 12, 15.1 million pounds; Pigment Blue 15.3, beta form, 11.8 million pounds; Pigment Red 49:1 barium toner, 5.2 million pounds; Pigment Red 57:1 calcium toner, 9.9 million pounds; Pigment Red 53:1, barium toner, 4.4 million pounds; and Pigment Yellow 14, 4.3 million pounds.

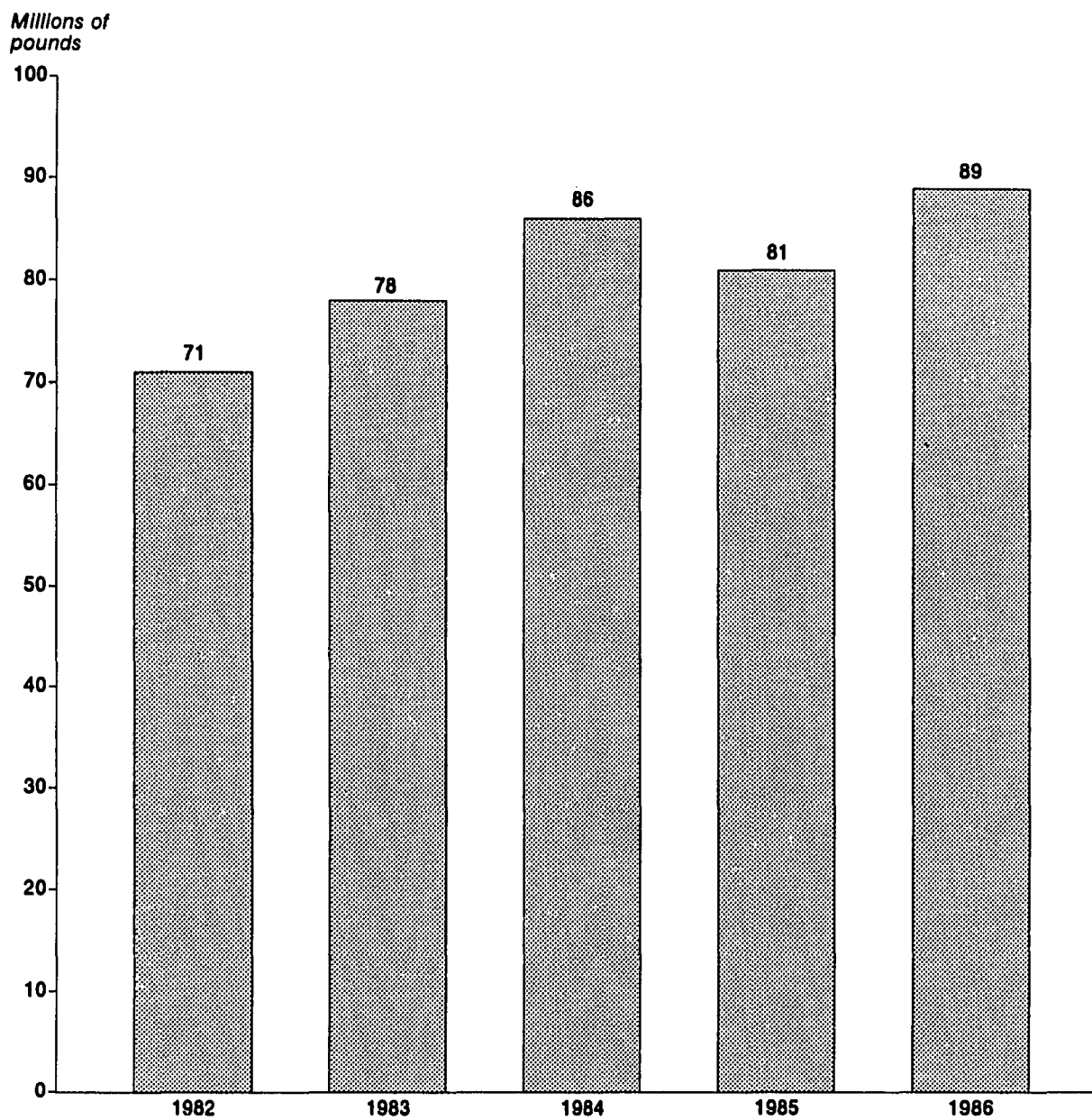
Production of lakes totaled 694,000 pounds in 1986, 17 percent higher than the 595,000 pounds reported for 1985. Sales of lakes in 1986 amounted to 532,000 pounds, valued at \$4.0 million. In terms of quantity, sales of lakes in 1986 were 7 percent higher than in 1985; in terms of value, sales in 1986 were 3 percent higher than in 1985.

Table 16 lists the products reported in this section and indicates the manufacturer(s) of each by code. These codes are identified by company name in table 17.

¹ Toners and lakes are essentially the same in their final form; they differ in the method of preparation. A lake is an organic pigment produced by the interaction of a soluble dye, a precipitant, and an absorptive inorganic substrate. A toner is an insoluble dye produced as a powder; some toners are extended by the inclusion of a solid diluent.

SECTION 5. ORGANIC PIGMENTS

Figure 6
Organic pigments



Source: U.S. International Trade Commission, *Synthetic Organic Chemicals: United States Production and Sales*.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 15
Organic pigments: U.S. production and sales, 1986

(Listed below are the organic pigments for which any reported data on production or sales may be published. (Leaders (...)) are used where the reported data are accepted in confidence and may not be published or where no data were reported.) Table 16 lists all organic pigments for which data on production and/or sales were reported and identifies the manufacturers of each)

Organic pigments	<i>Sales</i>			
	Production	Quantity	Value ¹	Unit value ²
	1,000 pounds dry basis ³	1,000 pounds dry basis ³	1,000 dollars	Per pound
Grand Total	88,521	76,711	513,132	\$6.69
Toners				
Total	87,827	76,179	509,122	6.68
Yellow toners, total	23,249	19,713	103,107	5.23
Acetoacetarylide yellows:				
Pigment Yellow 1, C.I. 11 680	127	107	635	5.91
Pigment Yellow 3, C.I. 11 710	151	164	1,124	6.84
Pigment Yellow 65, C.I. 11 740	157	126	1,018	8.10
Pigment Yellow 73	455	345	1,801	5.23
Pigment Yellow 74, C.I. 11 741	628	639	5,276	8.26
Diarylide yellows:				
Pigment Yellow 12, C.I. 21 090	15,145	12,082	56,704	4.69
Pigment Yellow 13, C.I. 21 100	304	297	1,897	6.38
Pigment Yellow 14, C.I. 21 095	4,349	4,086	18,437	4.51
Pigment Yellow 17, C.I. 21 105	595	560	3,650	6.52
Pigment Yellow 83, C.I. 21 108	877	865	7,584	8.77
All other yellow toners	461	442	4,981	11.27
Orange toners, total	2,937	2,640	17,489	6.63
Pigment Orange 5, C.I. 21 075	945	867	4,091	4.72
Pigment Orange 13, C.I. 21 110	120	112	954	8.52
Pigment Orange 16, C.I. 21 160	947	735	5,092	6.92
Pigment Orange 46, C.I. 15 602	750	767	3,984	5.20
All other orange toners	175	159	3,368	21.18
Red toners, total	31,264	27,517	191,589	6.89
Naphthol reds, total				
Pigment Red 2, C.I. 12 120	1,678	1,629	16,161	9.92
Pigment Red 5, C.I. 12 490	73	586	686	11.70
Pigment Red 17, C.I. 12 390	19	38	575	15.08
Pigment Red 23, C.I. 12 355	48	23	269	11.73
Pigment Red 31	121	117	1,522	13.02
Pigment Red 31	22	24	294	12.21
All other naphthol reds	1395	841	12,815	15.24
Pigment Red 3, C.I. 12 120	966	843	4,740	5.62
Pigment Red 4, C.I. 12 085	87	129	696	5.40
Pigment Red 38, C.I. 12 120	136	162	1,716	10.00
Pigment Red 48:1 barium toner, C.I. 15 865	2,001	1,940	9,606	4.95
Pigment Red 48:2, calcium toner, C.I. 15 865	1,638	1,585	9,451	5.96
Pigment Red 48:4, manganese toner C.I. 15 865	214	208	1,580	7.58
Pigment Red 49:1 barium toner, C.I. 15 630	5,221	4,167	14,880	3.57
Pigment Red 49:2, calcium toner, C.I. 15 630	886	788	3,794	4.81
Pigment Red 52:1, calcium toner, C.I. 15 860	784	784	5,444	6.94
Pigment Red 52.2 (manganese)	293	305	1,742	5.71
Pigment Red 53:1, barium toner, C.I. 15 585	4,416	3,860	15,623	4.05
Pigment Red 57:1, calcium toner, C.I. 15 850	9,947	8,407	40,993	4.88
Pigment Red 81, PMA, C.I. 45 160	434	430	6,743	15.69
All other red toners	2,563	2,280	58,420	25.82

See footnotes at end of table.

SECTION 5. ORGANIC PIGMENTS

Table 15—Continued

Organic pigments: U.S. production and sales, 1986

Organic pigments	Production	Sales		
		Quantity	Value ¹	Unit value ²
	1,000 pounds dry basis ³	1,000 pounds dry basis ³	1,000 dollars	Per pound
Toners—Continued				
Violet toners, total	2,924	3,020	54,839	\$18.16
Pigment Violet 1, PTA, C.I. 45 170	37	43	734	\$17.00
Pigment Violet 3, (PTA)	402	411	4,469	10.87
Pigment Violet 19, C.I. 46 500	1,763	1,818	35,231	19.38
Pigment Violet 23, C.I. 46 500	349	371	9,085	24.47
All other violet toners	373	377	5,320	14.11
Blue toners, total	24,758	20,659	121,642	5.89
Pigment Blue 1 (PMA)	41	...	...	...
Pigment Blue 15, alpha form, C.I. 74 160	1,024	586	4,208	7.17
Pigment Blue 15:1, alpha form, C.I. 74 160	1,136	1,027	10,519	10.24
Pigment Blue 15:2, alpha form, C.I. 74 160	690	544	5,442	10.00
Pigment Blue 15:3, beta form, C.I. 74 160	11,790	9,668	49,959	5.17
Pigment Blue 15:4 (β form)	1,455	991	6,812	6.87
All other blue toners	8,622	7,843	44,702	5.34
Green toners, total	2,418	2,318	18,729	8.08
Pigment Green 7, C.I. 74 260	2,289	2,176	16,676	7.66
All other green toners	129	142	2,053	14.58
Brown and black toners	277	312	1,727	5.54
Lakes				
Total	694	532	4,010	7.54
Pigment Red 83, C.I. 58 000	47	42	516	12.26
Pigment Violet 5:1, C.I. 58 055	43	42	373	8.82
All other lakes	604	448	3,121	6.97

¹ The value of sales for toners is reported on a dry full-strength basis and the value of sales for lakes is reported on a dry form basis. All sales value data exclude the additional cost of processing or packaging in commercial forms other than the dry full-strength or dry form.

² Calculated from unrounded figures.

³ Quantities for toners are reported as dry full-strength toner content, excluding the weight of any dispersing agent, vehicle, or extender. Quantities for lakes are reported as dry lake content, excluding the weight of any dispersing agent or vehicle.

Note.—The C.I. (*Colour Index*) number shown in this report are the identifying number given in the third edition of the *Colour Index*.

The abbreviations PMA and PTA stand for phosphomolybdic and phosphotungstic (including phosphotungstomolybdic) acids, respectively.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 16

Organic pigments for which U.S. production and/or sales were reported, identified by manufacturer, 1986

(Chemicals for which separate statistics are given in Table 15 are marked below with an asterisk (*); chemicals not so marked do not appear in Table 15 because the reported data are accepted in confidence and may not be published. Manufacturers' identification codes shown below are taken from Table 17. An "X" signifies that the manufacturer did not consent to his identification with the designated product)

<i>Organic pigments</i>	<i>Manufacturers' identification codes (according to list in table 17)</i>
Toners	
Yellow toners:	
Acetoacetarylides yellows:	
*Pigment Yellow	AMS, GLX, HSH, KCW, ROM, SNA, VPC.
Pigment Yellow 2	KCW.
*Pigment Yellow 3	HEU, HSH, HST, KCW, SNA, VPC.
Pigment Yellow 42	CGY.
Pigment Yellow 49	ROM.
Pigment Yellow 60	HSH.
*Pigment Yellow 65	HEU, HSH, SNA, VPC.
*Pigment Yellow 73	HSH, HST, SNA, VPC.
*Pigment Yellow 74	BAS, HEU, HSH, HST, KCW, ROM, SDH, SNA, VPC.
Pigment Yellow 75	HST.
Pigment Yellow 97	HST, STC.
Pigment Yellow 98	HST.
Pigment Yellow 116	VPC.
All others acetoacetarylides yellows	HST, KCW.
Diarylides yellows:	
*Pigment Yellow 12	AMS, APO, BAS, GLX, HSH, HST, ICC, IDC, IND, POP, ROM, SDH, SNA.
*Pigment Yellow 13	AP0, BAS, FAB, GLX, HST, IDC, IND, POP, ROM, SDH, SNA.
*Pigment Yellow 14	AMS, BAS, BNS, CGY, GLX, HSH, HST, ICC, IDC, IND, ROM, SDH, SNA.
*Pigment Yellow 17	AMS, APO, BAS, FAB, GLX, HSH, HST, ICC, IDC, IND, ROM, SDH, SNA, VPC.
Pigment Yellow 55	GLX.
*Pigment Yellow 83	BAS, FAB, GLX, HST, ICC, IND, ROM, SNA, STC, VPC.
Pigment Yellow 124	GLX.
Pigment Yellow 126	HST.
Pigment Yellow 127	HST.
Pigment Yellow 152	HST.
All other diarylides yellows	GLX.
Yellow pigments, other:	
(Basic Yellow 2), fugitive	MRX.
Pigment Yellow 139	VPC.
Pigment Yellow 150	CGY.
Orange toners:	
Pigment Orange 1	KCW.
Pigment Orange 2	UHL.
*Pigment Orange 5	CGY, HSH, HST, SDH, SNA.
*Pigment Orange 13	BAS, CGY, HSH, IND, ROM, SNA, VPC.
Pigment Orange 15	BNS, CGY.
*Pigment Orange 16	BNS, CGY, GLX, HSH, IND, ROM, VPC.
Pigment Orange 34	GLX, IND, ROM.
Pigment Orange 36	HST, SNA.
Pigment Orange 43	HST.
Pigment Orange 46	AMS, BAS, CMC, SDH, SNA.
Pigment Orange 48	CGY.
Pigment Orange 49	CGY.
All other pigment orange toners	CGY, GLX, VPC.
Red toners:	
Naphthol reds:	
Pigment Red 2	GLX, HSH, HST, KCW.
*Pigment Red 5	CGY, GLX, HSH, ROM.
Pigment Red 7	GLX.
Pigment Red 9	HST.
Pigment Red 13	KCW.

SECTION 5. ORGANIC PIGMENTS

Table 16—Continued

Organic pigments for which U.S. production and/or sales were reported, identified by manufacturer, 1986

<i>Organic pigments</i>	<i>Manufacturers' identification codes (according to list in table 17)</i>
Toners—Continued	
Red toners—Continued	
Naphthol reds—Continued:	
Pigment Red 14	HST.
*Pigment Red 17	BNS, IND, ROM, SNA, UHL.
Pigment Red 21	BNS.
Pigment Red 22	GLX, HEU, SNA.
*Pigment Red 23	GLX, HEU, HSH, INO, KCW, ROM, SNA, UHL.
Pigment Red 31	ROM, SDH.
Pigment Red 112	HST.
Pigment Red 147	HSH.
Pigment Red 170	GLX, HST.
All other naphthol reds	BUC, GLX, IND, KCW, ROM, SNA, X.
Red pigments, other:	
Pigment Red 1, (dark)	GLX.
Pigment Red 1, (light)	HSH.
*Pigment Red 3	BAS, CGY, HSH, KCW, MRX, SDH, SNA, UHL.
*Pigment Red 4	ALE, BAS, CGY, HSH, KCW, MRX, SDH, UHL.
*Pigment Red 38	GLX, HSH, HST, SNA, VPC.
Pigment Red 41	VPC.
Pigment Red 48	HEU.
*Pigment Red 48:1, (barium)	AMS, APO, BAS, CMC, HEU, HSH, MGR, MRX, SNA, UHL.
*Pigment Red 48:2, (calcium)	AMS, BAS, CIK, HEU, HSH, MGR, MRX, SDH, SNA, UHL, VPC.
Pigment Red 48:3, (strontium)	CGY, HSH.
*Pigment Red 48:4, (manganese)	CGY, HEU, HSH, SNA, VPC.
*Pigment Red 49:1, (barium)	AMS, BAS, BNS, BOR, CIK, ICC, IDC, MGR, SDH, SNA, UHL.
*Pigment Red 49:2, (calcium)	AMS, BNS, CMC, CIK, ICC, IDC, MGR, SDH, SNA, UHL.
*Pigment Red 52:1, (calcium)	BAS, MGR, SNA, UHL.
Pigment Red 52:2, (manganese)	BAS, HSH, UHL.
Pigment Red 53, (sodium)	ICC.
*Pigment Red 53:1, (barium)	ALE, AMS, APO, BAS, BOR, CIK, HSH, ICC, IDC, MGR, MRX, SDH, SNA, UHL.
Pigment Red 57	BNS.
*Pigment Red 57:1, (calcium)	AMS, APO, BAS, BNS, CGY, CML, HEU, HSH, ICC, IDC, KON, MGR, SDH, SNA, UHL.
Pigment Red 63	HSH.
Pigment Red 70	ICC.
*Pigment Red 81, (PMA)	MGR, MRX, SNA, UHL.
Pigment Red 81, (PTA)	MGR, MRX, UHL.
Pigment Red 88	VPC.
Pigment Red 101	CGY.
Pigment Red 122	SNA, VPC.
Pigment Red 123	SNA.
Pigment Red 168	VPC.
Pigment Red 179	VPC.
Pigment Red 181	HST.
Pigment Red 188	HST.
Pigment Red 190	VPC.
Pigment Red 200	BAS, SNA.
Pigment Red 202	CGY, SNA.
Pigment Red 206	CGY.
Pigment Red 207	CGY.
Pigment Red 209	SNA.
Pigment Red 224	VPC.
Pigment Red 245	IND.
All other pigment red toners	CGY, HST, STC, VPC.
Violet toners:	
Pigment Violet 1, (fugitive)	KCW, UHL.
Pigment Violet 1, (PMA)	BAS, MGR, MRX, UHL.
*Pigment Violet 1, (PTA)	MGR, MRX, SNA, UHL.
Pigment Violet 3, (fugitive)	KCW, MGR, UHL.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 16—Continued

Organic pigments for which U.S. production and/or sales were reported, identified by manufacturer, 1986

Organic pigments	Manufacturers' identification codes (according to list in table 17)
Toners—Continued	
Violet toners—Continued	
Pigment Violet 3, (PTA)	BAS, MGR, MRX, UHL.
Pigment Violet 4, (fugitive)	KCW.
Pigment Violet 5:1	VPC.
*Pigment Violet 19	SNA, VPC.
*Pigment Violet 23	HST, IPP, ROM, SDC, SNA, VPC.
Pigment Violet 29	VPC.
Pigment Violet 31	VPC.
Pigment Violet 42	CGY.
All other pigment violet toners	BUC, X.
Blue toners:	
(Basic Blue 7)	KCW.
*Pigment Blue 1, (PMA)	BNS, MRX, SDH, UHL.
Pigment Blue 1, (PTA)	MGR, MRX.
Pigment Blue 2, (PMA)	UHL.
Pigment Blue 14, (PMA)	BAS, UHL, VPC.
*Pigment Blue 15, (α form)	BAS, CGY, HEU, HSH, SDH, SNA, USM, TMS, VPC.
*Pigment Blue 15:1, (α form)	BAS, CGY, SDH, SNA, VPC.
*Pigment Blue 15:2, (α form)	BAS, CGY, SDH, SNA, VPC.
*Pigment Blue 15:3, (β form)	ALE, AMS, APO, BAS, BMX, CGY, CIK, CMC, CUS, DUP, IDC, IPP, MGR, POP, ROM, SDH, SNA, VPC.
Pigment Blue 15:4, (β form)	BAS, CGY, CUS, HEU, SNA, VPC.
Pigment Blue 19	PSG.
Pigment Blue 25	GLX.
Pigment Blue 27	CGY.
Pigment Blue 61	BAS.
All other pigment blue toners	MGR.
Green toners:	
Pigment Green 1, (PMA)	MRX, UHL.
Pigment Green 2, (PMA)	MRX.
Pigment Green 2, (PTA)	MRX, UHL.
Pigment Green 4, (PMA)	UHL.
*Pigment Green 7	ALG, MGR, POP, SDH, SNA, VPC.
Pigment Green 8	CGY, KCW.
Pigment Green 10	HEU.
Pigment Green 36	SNA, VPC.
All other pigment green toners	UHL, X.
Brown toners:	
*Pigment Brown 5	GLX, ICC, VPC.
All other pigment brown toner	SDH, UHL, VPC.
Black toners:	
Pigment Black 7	HST, STC, VPC.
All other pigment black toners	UHL, VPC.
Lakes	
Yellow lakes:	
(Acid Yellow 1)	KCW.
(Acid Yellow 23)	KON, MRX.
Orange lakes	
Pigment Orange 17	KCW.
Red lakes:	
(Acid Red 26)	KLW.
(Basic Red 1)	BNS.
(Basic Red 81, PMA)	LVR.
Pigment Red 60:1	HSH, MRX, SNA.
*Pigment Red 83	HSH, MRX, UHL.
Violet lakes:	
(Basic Violet 1)	BNS.
(Basic Violet 4)	BNS.
(Basic Violet 10)	BNS.
*Pigment Violet 5:1	HSH, MRX, UHL.

SECTION 5. ORGANIC PIGMENTS

Table 16—Continued

Organic pigments for which U.S. production and/or sales were reported, identified by manufacturer, 1986

<i>Organic pigments</i>	<i>Manufacturers' identification codes (according to list in table 17)</i>
Lakes—Continued	
Blue lakes:	
(Basic Blue 9)	LVR.
(Basic Blue 14, (PMA)	LVR.
Green lakes:	
(Acid Green 3)	KCW.
(Basic Green 1, (PMA)	LVR.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 17

Organic pigments alphabetical directory of manufacturers by code, 1986

(Names of manufacturers that reported production and/or sales of organic pigments to the U.S. International Trade Commission for 1986 are listed below in the order of their identification codes as used in table 16)

<i>Code</i>	<i>Name of company</i>	<i>Code</i>	<i>Name of company</i>
ALE	Alex Chemical Co.	IND	Indol Color Co., Inc.
ALG	Allegheny Chemical Corp.	IPP	Spectrachem Corp.
AMS	Ridgway Color Co.	KCW	Keystone Color Works, Inc.
APO	Apollo Colors, Inc.	KON	H. Kohnstamm & Co., Inc.
BAS	BASF Corp.	LVR	C. Lever Co., Inc.
BMX	Blu-Max Pigments, Inc.	MGR	Magruder Color Co., Inc.
BNS	Binney and Smith, Inc.	MRX	Johnson Mattney, Inc., Pigment Dept.
BUC	Synalloy Corp., Blackman Uhler Chemical Div.	POP	Pope Chemical Corp.
CGY	Ciba-Gelgy Corp.	PSG	PMC Specialities Group, Inc.
CIK	Flint Ink Corp., Cal/Ink Div.	ROM	Roma Color, Inc.
CMC	Chromatic Color Corp.	S	Sandoz Inc. Colors and Chemicals Div.
CUS	Customs Pigments Corp.	SDC	Sandoz Chemicals Corp.
FAB	Fabricolor Manufacturing Corp.	SDH	Sterling Drug, Inc., SDI Divestiture Corp.
GLX	Galaxie Chemical Corp.	SNA	Sun Chemical Corp., Pigment Div.
HEU	Heubach, Inc.	STC	American Hoechst Corp., Sou-Tex Works
HSH	Harshaw/Filtrol Partnership	TMS	Sterling Drug, Inc., SDI Divestiture Corp.
HST	American Hoechst Corp., Specialty Products Group, Rhode Island Works	UHL	Paul Uhlich & Co., Inc.
ICC	BASF Corp Inmont Div.	VPC	Mobay Chemical Corp., Dyes & Pigments Div.
IDC	Industrial Color, Inc.		

Note.—Complete names, telephone numbers, and addresses of the above reporting companies are listed in app. A.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

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SECTION 6. MEDICINAL CHEMICALS

Elizabeth R. Nesbitt

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Medicinal chemicals include the medicinal and feed grades of all organic chemicals having therapeutic value, whether obtained by chemical synthesis, by fermentation, by extraction from naturally occurring plant or animal substances, or by refining a technical grade product. They include antibiotics and other anti-infective agents, antihistamines, autonomic drugs, cardiovascular agents, central nervous system depressants and stimulants, hormones and synthetic substitutes, vitamins, and other therapeutic agents for human or veterinary use, and for animal feed supplements. Data for the production of these products during 1982-86 are shown in figure 7.

Table 18 shows statistics for production and sales of medicinal chemicals grouped by pharmacological class. The statistics shown are for bulk chemicals only. Finished pharmaceutical preparations and products put up in pills, capsules, tablets, or other measured doses are excluded.¹ The difference between production and sales reflects inventory changes, processing losses, and captive consumption of medicinal chemicals processed into ethical and proprietary pharmaceutical products by the primary manufacturer. In some instances, the difference may also include quantities for medicinal grade products used as intermediates; for example, penicillin V used as an intermediate in the manufacture of other antibiotics. All quantities are given in terms of 100 percent content of the pure bulk drug. Table 19 lists the products reported in this section and indicates the manufacturer(s) of each by code. These codes are identified by company name in table 20.

Total U.S. production of bulk medicinal chemicals in 1986 amounted to 264.1 million pounds. Total sales of bulk medicinal chemicals in 1986 amounted to 158.4 million pounds, valued at \$1,517.5 million. Beginning in 1980, methionine and most other amino acids and their salts are reported in the section on Miscellaneous End-Use Chemicals and Chemical Products. Section totals are not, therefore, comparable with years prior to 1980.

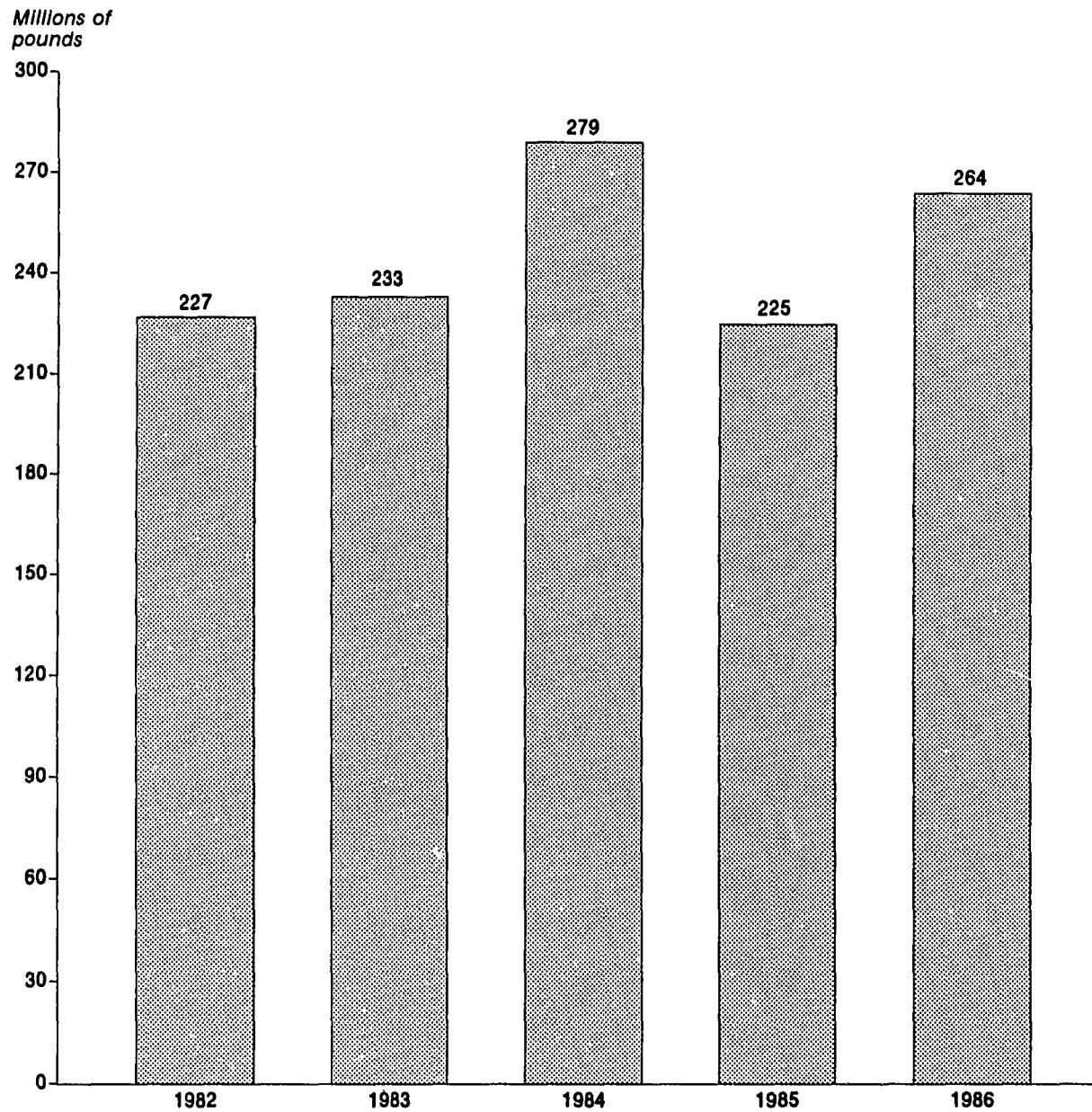
Production of the larger groups of medicinal chemicals in 1986 was as follows (see table 18): Antibiotics, 44.4 million pounds, 39.2 percent higher than in 1985; anti-infective agents other than antibiotics, 28.2 million pounds, 12.0 percent higher than in 1985; central nervous system depressants and stimulants, 69.9 million pounds, 10.6 percent higher than in 1985; gastrointestinal agents and therapeutic nutrients, 57.7 million pounds, 19.0 percent higher than in 1985; and vitamins, 41.2 million pounds, 9.6 percent higher than in 1985.

Production of some of the more important individual products in the table was as follows: Choline chloride, 51.3 million pounds, 16.1 percent more than in 1985; aspirin, 30.5 million pounds, 8.2 percent more; and vitamin E, 18.6 million pounds, 35.8 percent more.

¹ Complementary statistics on the dollar value of manufacturers' shipments of finished pharmaceutical preparations, except biologicals, are published annually by the U.S. Department of Commerce, Bureau of the Census, in Current Industrial Reports, Series MA-28G. Many pharmaceutical manufacturers that report to the Bureau of the Census are excluded from the U.S. International Trade Commission report because they are not primary producers of medicinal chemicals; that is, they do not themselves produce the bulk drugs which go into their pharmaceutical products, but purchase their drug requirements from domestic or foreign producers.

SECTION 6. MEDICINAL CHEMICALS

Figure 7
Medicinal chemicals



Source: U.S. International Trade Commission, *Synthetic Organic Chemicals: United States Production and Sales*.

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SYNTHETIC ORGANIC CHEMICALS, 1986

Table 18

Medicinal chemicals: U.S. production and sales, 1986

(Listed below are all synthetic organic medicinal chemicals for which any reported data on production or sales may be published. (Leaders (...)) are used where the reported data are accepted in confidence and may not be published or where no data were reported.) Table 19 lists all medicinal chemicals for which data on production and/or sales were reported and identifies the manufacturers of each)

Medicinal chemicals	Sales			
	Production ¹	Quantity	Value	Unit value ²
	1,000 pounds	1,000 pounds	1,000 dollars	Per pound
Grand total	284,062	158,448	1,517,530	\$9.58
Acyclic	56,442	52,253	153,136	2.93
Benzenoid ³	143,646	76,048	781,633	10.41
Cyclic nonbenzenoid ⁴	63,973	30,147	572,761	18.71
Antibiotics, total	44,430	11,332	504,181	44.49
Cephalosporins	1,704	...	...	...
Penicillins, total ⁵	7,719	1,522	39,833	26.17
All other antibiotics, total	35,007	9,810	464,348	47.34
For medicinal use ⁶	4,448	3,672	379,255	103.27
For nonmedicinal uses ⁷	30,559	6,138	85,093	13.87
Antihistamines, total	263	185	24,345	131.46
Antinauseants	32	26	1,085	41.71
All other antihistamines	231	159	23,260	146.31
Anti-infective agents (except antibiotics), total	28,230	11,280	36,325	3.22
Anthelmintics	13,583	...	...	...
Antiprotozoan agents	9,499	...	...	...
All other anti-infective agents(except antibiotics) ⁸ ..	5,148	11,280	36,325	3.22
Autonomic drugs, total	864	811	18,578	22.90
Sympathomimetic (adrenergic) agents	833	803	16,609	20.66
All other autonomic drugs	31	8	1,969	245.95
Central depressants and stimulants, total	69,948	49,771	340,176	6.83
Analgesics, antipyretics, and nonhormonal anti-inflammatory agents, total	62,715	45,235	140,524	3.11
Aspirin	30,483	...	...	...
All other analgesics, antipyretics, and nonhormonal anti-inflammatory agents ⁹	32,232	45,235	140,524	3.11
Anticonvulsants, hypnotics, and sedatives	1,676	290	9,250	31.90
Antidepressants	148	22	1,559	71.02
Antitussives	354	294	49,540	168.51
Tranquillizers	38	13	4,885	374.24
All other central depressants and stimulants ¹⁰	5,017	3,917	134,418	34.32
Dermatological agents	14,420	3,136	3,497	1.12
Expectorants and mucolytic agents	1,109	915	7,327	8.01
Gastrointestinal agents and therapeutic nutrients, total¹¹	57,661	57,981	58,286	1.01
Choline chloride, all grades	51,263	47,910	20,681	.43
All other gastrointestinal agents and therapeutic nutrients	6,398	10,071	37,605	3.73

See footnotes at end of table.

SECTION 6. MEDICINAL CHEMICALS

Table 18—Continued
Medicinal chemicals: U.S. production and sales, 1986

<i>Medicinal chemicals</i>	<i>Production¹</i>	<i>Sales</i>		
		<i>Quantity</i>	<i>Value</i>	<i>Unit value²</i>
		<i>1,000 pounds</i>	<i>1,000 dollars</i>	<i>Per pound</i>
Hormones and synthetic substitutes	764	...	...	...
Renal-acting and edema-reducing agents	795	75	10,145	\$135.51
Smooth muscle relaxants ¹²	71	...	...	...
Vitamins, total	41,216	21,388	133,554	6.24
Vitamin E	18,609	10,773	110,943	16.18
All other vitamins ¹³	22,607	10,615	22,611	2.13
Miscellaneous medicinal chemicals ¹⁴	4,291	1,574	381,116	242.19

¹ The data on production and sales are for bulk medicinal chemicals only. Methionine and most other amino acids and their salts are now reported in the section on Miscellaneous End-Use Chemicals and Chemical Products. Section totals are not, therefore, comparable with years prior to 1980.

² Calculated from rounded figures.

³ Benzenoid, as used in this report, describes any cyclic medicinal chemical whose molecule contains either a 6-membered carbocyclic ring with conjugated double bonds or a 6-membered heterocyclic ring with 1 or 2 hetero atoms and conjugated double bonds, except the pyrimidine ring.

⁴ Includes antibiotics of unknown structure.

⁵ Includes semisynthetic penicillins and all other penicillins.

⁶ Includes production and sales of antifungal and antitubercular antibiotics and tetracyclines; also includes sales quantity and value of cephalosporins.

⁷ Includes production and sales of tetracyclines.

⁸ Includes sales quantity and value of anthelmintics and antiprotozoan agents; also includes production and sales of sulfonamides and urinary antiseptics; does not include production of sulfaguanidine used as an intermediate in the production of anti-infective sulfonamides.

⁹ Includes sales quantity and value of aspirin; also production and sales of acetaminophen.

¹⁰ Includes production and sales of amphetamines, general anesthetics, respiratory and cerebral stimulants, and skeletal muscle relaxants.

¹¹ Methionine and its salts are now reported in the section in Miscellaneous End-Use Chemicals and Chemical Products under amino acids.

¹² Includes theophylline derivatives.

¹³ Includes production and sales of vitamin A, vitamin B, vitamin C, vitamin D, and vitamin K.

¹⁴ Includes production and sales of antineoplastic agents, cardiovascular agents, diagnostic agents, hematological agents, and unclassified medicinal chemicals. Also includes production and sales of local anesthetics, and sales value and quantity of hormones and synthetic substitutes and smooth muscle relaxants.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 19

Medicinal chemicals for which U.S. production and/or sales were reported, identified by manufactures, 1986

(Chemicals for which separate statistics are given in table 18 are marked below with an asterisk (*); chemicals not so marked do not appear in table 18 because the reported data are accepted in confidence and may not be published. Manufacturers' identification codes shown below are taken from table 20.

An "X" signifies that the manufacturer did not consent to his identification with the designated product)

<i>Medicinal chemicals</i>	<i>Manufacturers' identification codes (according to list in table 20)</i>
*Antibiotics:	
*Cephalosporins:	
Cefaclor	LIL.
Cefamandole	LIL.
Cefazolin, sodium	LIL.
Cefoxitin	MRK.
Cephalexin	LIL.
Cephaloridine	LIL.
Cephalothin, sodium	LIL.
Cephapirin	BRS.
Cephapirin, sodium	BRS.
Cephradine	TRD.
*Penicillins:	
Penicillins, semisynthetic:	
Amoxicillin:	
Amoxicillin (trihydrate)	BEE, BOC, BRS, KAN.
Amoxicillin (anhydrous)	BEE.
Ampicillin:	
Ampicillin (anhydrous)	BEW, WYT.
Ampicillin (trihydrate)	BEE, BEW, BOC, BRS, KAN.
Other semisynthetic penicillins:	
Ampicillin, sodium	BEE, BEW, BRS, WYT.
Carbenicillin, disodium	BOE.
Carbenicillin indanyl, sodium	PFZ.
Cloxacillin, benzathine	BEE.
Cloxacillin, sodium	BEE, BOC.
Cyclacillin	BOC.
Dicloxacillin, sodium	BEE, BOC, WYT.
Epicillin	KAN.
Hetacillin, potassium	BRS.
Nafcillin, sodium	BEE, WYT.
Oxacillin, sodium	BEE, BOC.
Piperacillin	BRS.
Ticarcillin, disodium	BEE, BEW.
Ticarcillin, sodium	BEW.
Penicillins (except semisynthetic):	
For medicinal use:	
Penicillin V	PFZ.
Penicillin G, benzathine	WYT.
Penicillin G, potassium	PFZ.
Penicillin V, potassium	LIL.
Penicillin G, procaine (medicinal grade)	FZ, WYT.
For nonmedicinal uses:	
Penicillin G, procaine (animal feed grade)	MRK, PFZ.
Tetracyclines:	
For medicinal use:	
Chlortetracycline (medicinal grade)	ACY.
Doxycycline	PFZ.
Minocycline	ACY.
Oxytetracycline (medicinal grade)	PFZ.
Tetracycline	ACY.
For nonmedicinal uses:	
Chlortetracycline (animal feed grade)	ACY, PFZ.
Oxytetracycline (animal feed grade)	PFZ.
*Other antibiotics:	
*For medicinal use:	
Antifungal antibiotics:	
Amphotericin B	PEN, TRD.
Nystatin (medicinal grade)	ACY, TRD.

SECTION 6. MEDICINAL CHEMICALS

Table 19—Continued

Medicinal chemicals for which U.S. production and/or sales were reported, identified by manufactures, 1986

<i>Medicinal chemicals</i>	<i>Manufacturers' identification codes (according to list in table 20)</i>
*Antibiotics—Continued:	
*Other antibiotics—Continued:	
For medicinal use—Continued	
Antifungal antibiotics—Continued	
Tobramycin	LIL.
Antitubercular antibiotics:	
Dihydrostreptomycin	PFZ.
Other antibiotics for medicinal use:	
Aztreonam	TRD.
Bacitracin (medicinal grade)	IMC.
Cefonicid	SK.
Clindamycin	UPJ.
Erythromycin	ABB, UPJ.
Erythromycin estolate	LIL.
Erythromycin stearate	UPJ.
Gentamycin	SCH.
Imipenem	MRK.
Kanamycin	BRS.
Lincomycin (medicinal grade)	UPJ.
Moxalactam	LIL.
Neomycin (medicinal grade)	UPJ.
Netilmicin	SCH.
Novoblocln, sodium	UPJ.
Polymyxin B	PFZ.
Sisomicin	SCH.
Spectinomycin (medicinal grade)	ABB, UPJ.
Thiostrepton	TRD.
Vancomycin	LIL.
All other antibiotics, for medicinal use	RSA.
*For nonmedicinal uses:	
Bacitracin (animal feed grade)	IMC.
Cycloheximide	UPJ.
Hygromycin B	LIL.
Lasalocid	HOF.
Lincomycin (animal feed grade)	UPJ.
Monesin	LIL.
Neomycin (animal feed grade)	PFZ, UPJ.
Novoblocln (animal feed grade)	UPJ.
Streptomycin	PFZ.
Tylosin	LIL.
*Antihistamines:	
*Antinauseants:	
Cyclizine hydrochloride	BUR.
Dimenhydrinate	GAN.
Mecizine hydrochloride	PFZ.
Metoclopramide hydrochloride	LLI.
Trimethobenzamide hydrochloride	HOF.
*Other antihistamines:	
Brompheniramine maleate	HEX, LLI.
Chlorpheniramine maleate	HEX, SK.
Chlorpheniramine tannate	HEX.
Cyproheptadine hydrochloride	MRK.
Dexbrompheniramine maleate	HEX.
Dimethindene maleate	CGY.
Diphenhydramine citrate	WYK.
Diphenhydramine hydrochloride	PD.
Doxylamine succinate	BKC, HOF.
Phenindamine tartrate	HOF.
Phenyltoloxamine citrate	GAN, PD.
Pyrilamine maleate	HEX.
Pyrilamine tannate	HEX.
Terfenadine	MDP.
Tripelennamine	CGY.
Tripelennamine citrate	CGY.
Tripelennamine hydrochloride	CGY.
Tripelennamine hydrochloride	BUR.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 19—Continued

Medicinal chemicals for which U.S. production and/or sales were reported, identified by manufactures, 1986

<i>Medicinal chemicals</i>	<i>Manufacturers' identification codes (according to list in table 20)</i>
*Anti-infective agents (except antibiotics):	
*Anthelmintics:	
Triprolidine hydrochloride	BUR.
Diethylcarbamazine citrate	SK.
Ivermectin	MRK.
Phenothiazine	WAG.
Piperazine	TX, UCC.
Piperazine dihydrochloride	FLM.
Piperazine hydrochloride	DAN, FLM.
Piperazine sulfate	FLM.
Pyrantel pamoate	PFZ.
Pyrantel tartrate	PFZ.
Thiabendazole	MRK.
*Antiprotozoan agents:	
Arsenic and bismuth compounds:	
Arsanilic acid	FLM, WHL.
Bismuth subsalicylate	NOR.
Carbarsone	WHL.
Nitarsonsone	SAL.
Roxarsone	SAL.
Roxarsone, sodium	SAL.
Other antiprotozoan agents:	
Aklomide	SAL.
Amprolium	MRK.
Dinitolmide	SAL.
Ethopabate	MRK.
Hydroxychloroquine sulfate	SDW.
Iodochlorhydroxyquin	CGY.
Ipronidazole	HOF.
Nitromide	SAL.
Sulfonamides	
Mafenide	SDW.
Mafenide acetate	SDW.
Sulfabenzamide	ACY.
Sulfacetamide, sodium	SCH.
Sulfadiazine	ACY.
Sulfadiazine, silver	LEM.
Sulfadimethoxine	HOF.
Sulfamethazine	SAL.
Sulfamethazine, sodium	SAL.
Sulfamethizole	ACY.
Sulfamethoxazole	HOF.
Sulfaniltran	SAL.
Sulfasalazine	SAL.
Sulfathiazole, sodium	SAL.
Sulfisoxazole	HOF.
Sulfisoxazole, acetyl	HOF.
Urinary antiseptics:	
Methenamine hippurate	RIK.
Methenamine mandelate	ARN, PD.
*Other anti-infective agents:	
Antifungal agents:	
Benzolic acid	KLM.
Calcium undecylenate	WTL.
Flucytosine	HOF.
Sodium caprylate	LEM.
Zinc undecylenate	WTL.
Antileprotic and antitubercular agents:	
Aminosallylic acid	HXL.
Sulfoxone, sodium	ABB.
Antiviral agents:	
Acyclovir	BUR.
All other antiviral agents	X.
General antiseptics and antibacterial agents:	
Bromchlorenone	MHI.

SECTION 6. MEDICINAL CHEMICALS

Table 19—Continued

Medicinal chemicals for which U.S. production and/or sales were reported, identified by manufactures, 1986

<i>Medicinal chemicals</i>	<i>Manufacturers' identification codes (according to list in table 20)</i>
*Anti-infective agents (except antibiotics)—Continued	
*Other anti-infective agents—Continued	
General antiseptics and antibacterial agents—Continued:	
Capreomycin	LIL.
Ceftazidime	LIL, MRK, SK.
Cetylpyridinium chloride	HXL.
Chlorobutanol	SFS.
m-Cresyl acetate	ADC.
8-Hydroxy-5-quinolinesulfonic acid	MRK.
Iodoform	DPW, MAL.
Ormetoprim	HOF.
Oxyquinoline benzoate (benoxiquine)	LEM.
Oxyquinoline sulfate	LEM.
Pentamidine isethionate	MRX.
Povidone-iodine	GAF.
Resorcinol	KPT.
Trimethoprim	BUR, HOF, LEM.
All other anti-infective agents	LIL.
*Autonomic drugs	
*Sympathomimetic agents:	
Dobutamine hydrochloride	LIL.
Methoxyphenamine hydrochloride	HXL.
Naphazoline hydrochloride	CGY.
Phenylephrine bitartrate	GAN.
Phenylephrine hydrochloride	GAN, SDW.
Phenylpropanolamine bitartrate	ARS.
Phenylpropanolamine hydrochloride	ARS, GAN, HEX, NEP, ORT.
Propylhexedrine	SK.
Pseudoephedrine hydrochloride	BUR, GAN.
Pseudoephedrine sulfate	GAN.
Terbutaline sulfate	CGY, PFZ.
All other sympathomimetic (adrenergic) agents	SCH.
*Other autonomic drugs:	
Parasympatholytic quaternary ammonium compounds (except tropane derivatives):	
Glycopyrrolate	LLI.
Propantheline bromide	SRL.
Tridihexethyl chloride	ACY.
Parasympatholytic tertiary amines (except tropane derivatives):	
Oxybutynin chloride	ABB, PD.
Oxyphencyclimine hydrochloride	PFZ.
Trihexyphenidyl hydrochloride	ACY.
Parasympatholytic tropane derivatives:	
Benztropine mesylate	MRK, X.
Parasympathomimetic agents:	
Bethanechol chloride	GAN.
Neostigmine methylsulfate	HOF.
Pyridostigmine bromide	HOF.
Sympatholytic agents:	
Timoilol maleate	MRK.
*Central depressants and stimulants:	
*Analgesics, antipyretics, and nonhormonal anti-inflammatory agents:	
Acetaminophen	MAL, MON, SWD.
Alfentanil hydrochloride	MRX.
Aminobenzolic acid	WYK.
*Aspirin	DOW, MON, NOR, SD.
Aurothiogluucose	SCH.
Carprofen	HOF.
Choline magnesium salicylate	LEM.
Diflunisal	MRK.
Fenoprofen	LIL.
Fentanyl citrate	MRX.
Ibuprofen	HEX, TNA.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 19—Continued

Medicinal chemicals for which U.S. production and/or sales were reported, identified by manufactures, 1986

<i>Medicinal chemicals</i>	<i>Manufacturers' identification codes (according to list in table 20)</i>
*Central depressants and stimulants—Continued	
*Analgesics, antipyretics, and nonhormonal anti-inflammatory agents—Continued	
Indomethacin	MRK.
Meclofenamate, sodium	PD, WYK.
Meclofenamic acid	PD.
Mefenamic acid	PD.
Meperidine hydrochloride	PEN, SDW.
Methadone hydrochloride	MAL.
Morphine sulfate	PEN.
Oxycodone hydrochloride	DUP, MAL, PEN.
Pentazocine	SD.
Pentazocine hydrochloride	SD.
Piroxicam	PFZ.
Potassium aminobenzoate	GAN.
Potassium salicylate	KLM.
Propoxyphene hydrochloride	GAN, LIL.
Propoxyphene napsylate	GAN, LIL.
Salsalate	RIK, WYK.
Sodium aminobenzoate	GAN.
Sodium salicylate	KLM.
Sufentanil citrate	MRX.
Sulindac	MRK.
All other analgesics and antipyretics, other than salicylates	X.
*Anticonvulsants, hypnotics, and sedatives:	
Anticonvulsants (except barbiturates):	
Aminoglutethimide	CGY.
Ethosuximide	PD.
Ethotoin	ABB.
Methsuximide	PD.
Phensuximide	PD.
Phenytoin	PD.
Phenytoin, sodium	PD.
Valproic acid	ABB.
*Anticonvulsants, hypnotics, and sedatives:	
Barbiturates:	
Amobarbital	GAN.
Amobarbital, sodium	GAN.
Butabarbital	GAN.
Butabarbital, sodium	ABB.
Butabital	GAN.
Pentobarbital	GAN.
Pentobarbital, sodium	GAN.
Phenobarbital	GAN.
Phenobarbital, sodium	GAN.
Poly(oxy-1,2-ethanediyl)- α -carboxymethyl, omega-(tridecyloxy), potassium salt	ABB, GAN.
Secobarbital	GAN.
Secobarbital, sodium	GAN.
Thiamylal, sodium	ABB.
Thiopental, sodium	ABB.
Hypnotics and sedatives (except barbiturates):	
Alprazolam	UPJ.
Droperidol	MRX.
Ethchlorvynol	ABB.
Glutethimide	CGY, GAN.
Methyprylon	ABB.
*Antidepressants:	
Amitriptyline	MRK.
Amitriptyline hydrochloride	GAN, MRK.
Doxepin hydrochloride	PFZ, SK.
Fluoxetine hydrochloride	LIL.
Imipramine hydrochloride	CGY.

SECTION 6. MEDICINAL CHEMICALS

Table 19—Continued

Medicinal chemicals for which U.S. production and/or sales were reported, identified by manufactures, 1986

<i>Medicinal chemicals</i>	<i>Manufacturers' identification codes (according to list in table 20)</i>
*Central depressants and stimulants—Continued	
*Antidepressants—Continued:	
Maprotiline hydrochloride	CGY.
Nortriptyline hydrochloride	LIL.
*Antitussives:	
Benzonatate	CGY.
Caramiphen edisylate	SK.
Codeine	MAL, PEN.
Dextromethorphan hydrobromide	AMD, HOF.
Hydrocodone bitartrate	MAL, PEN.
Noscapine	PEN.
Thebaine	MAL, PEN.
*Tranquillizers:	
Phenothiazine derivatives:	
Acetophenazine maleate	SCH.
Chlorpromazine hydrochloride	SK.
Fluphenazine hydrochloride	SCH.
Perphenazine	SCH.
Other tranquillizers:	
Clorazepate dipotassium	ABB.
Hydroxyzine pamoate	LEM.
Molindone hydrochloride	PD.
Prazepam	PD.
Thiothixene hydrochloride	PFZ.
Triazolam	UPJ.
*Other central depressants and stimulants:	
Amphetamines:	
Amphetamine	ARN.
Amphetamine sulfate	ARN.
Dextroamphetamine	ARN.
Dextroamphetamine sulfate	ARN.
Methamphetamine	ARN.
Methamphetamine hydrochloride	ARN.
General anesthetics:	
Enflurane	OH.
Isoflurane	OH.
Ketamine hydrochloride	PD.
Respiratory and cerebral stimulants:	
Caffeine (natural and synthetic):	
Caffeine, natural	CPR, GNF.
Caffeine, synthetic	PFZ.
Other respiratory and cerebral stimulants:	
Benzphetamine hydrochloride	UPJ.
Diethylpropion hydrochloride	GAN.
Doxapram hydrochloride	LLI.
Methylphenidate hydrochloride	CGY.
Nikethamide	CGY.
Pemoline	ABB.
Phendimetrazine tartrate	GAN.
Phentermine	GAN, SWD.
Phentermine hydrochloride	HEX.
Skeletal muscle relaxants:	
Chlorphenesin carbamate	UPJ.
Cyclobenzaprine hydrochloride	MRK, WYK.
Methocarbamol	ABB, HEX, LLI.
Orphenadrine citrate	RIK.
Succinylcholine chloride	ABB, BUR.
Tubocurarine	ABB.
*Dermatological agents:	
Aluminum phenolsulfonate	SAL.
Ammonium phenolsulfonate	SAL.
Etretinate	HOF.
Salicylic acid	DOW, KLM, MON.
Zinc phenolsulfonate	MAL, SAL, SD.
Zinc salicylate	RSA.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 19—Continued

Medicinal chemicals for which U.S. production and/or sales were reported, identified by manufactures, 1986

<i>Medicinal chemicals</i>	<i>Manufacturers' identification codes (according to list in table 20)</i>
*Expectorants and mucolytic agents:	
Ethylenediamine dihydroiodide	AJY, DPW.
Guaifenesin	LLI.
Iodinated glycerol	X.
*Gastrointestinal agents and therapeutic nutrients:	
Gastrointestinal agents:	
Choline chloride (all grades):	
*Choline chloride (animal feed grade)	CHO, HFT, IMC, NUT, TMH.
Choline chloride (medicinal grade)	HFT.
Other gastrointestinal agents:	
Betaine hydrochloride	HFT.
Calcium polycarbophil	LLI.
All other cholericics and hydrocholeretics	UPJ.
Choline bicarbonate	HFT, IMC.
Choline bitartrate	HFT.
Choline dihydrogen citrate	HFT.
Cimetidine	SK.
Cimetidine hydrochloride	SK.
Colestipol hydrochloride	UPJ.
Dextrothyroxine, sodium	BAX.
Dihydroxyaluminum aminoacetate	CHT.
Diphenoxylate	MAL.
Docosate, potassium	ACY.
Docosate, sodium	ACY.
Gemfibrozil	PD.
Magnesium citrate	MAL.
Methscopolamine bromide	UPJ.
Nizatidine	LIL.
Probucol	MDP.
Sitosterols	UPJ.
Therapeutic nutrients:	
Calcium gluceptate	PFN.
Copper gluconate	PFZ.
Magnesium gluconate	PFZ.
Manganese gluconate	PFZ.
Potassium gluconate	PFZ.
Zinc gluconate	PFZ.
*Hormones and synthetic substitutes:	
Anabolic agents and androgen:	
Androstenedione	NSW.
Fluoxymesterone	UPJ.
Methyltestosterone	UPJ.
Stanozolol	SD.
Testosterone	UPJ.
Testosterone cypionate	UPJ.
Testosterone enanthate	X.
Testosterone propionate	UPJ.
Zeranol	IMC.
All other anabolic agents and androgens	X.
Corticosteroids:	
Beclomethasone	SCH.
Betamethasone	SCH, X.
Betamethasone dipropionate	SCH.
Betamethasone sodium phosphate	SCH.
Betamethasone valerate	SCH.
Cortisone acetate	UPJ.
Dexamethasone	MRK, X.
Dexamethasone acetate	MRK.
Dexamethasone sodium phosphate	MRK, X.
Diflorasone diacetate	UPJ.
Fludrocortisone acetate	UPJ.
Fluorometholone	UPJ.
Halcinonide	TRD.

SECTION 6. MEDICINAL CHEMICALS

Table 19—Continued

Medicinal chemicals for which U.S. production and/or sales were reported, identified by manufactures, 1986

<i>Medicinal chemicals</i>	<i>Manufacturers' identification codes (according to list in table 20)</i>
*Hormones and synthetic substitutes—Continued:	
Corticosteroids—Continued:	
Hydrocortisone	UPJ.
Hydrocortisone acetate	UPJ.
Medrysone	UPJ.
Meprednisone	UPJ.
Methylprednisolone	UPJ.
Prednisolone	MRK, UPJ.
Prednisolone acetate	UPJ.
Prednisone	UPJ.
Triamcinolone	TRD, X.
Triamcinolone acetonide	TRD, X.
Triamcinolone diacetate	TRD, X.
All other corticosteroids	X.
Estrogens and progestogens:	
Estrogens:	
Estradiol cypionate	UPJ.
Estrogens, conjugated	ORG.
Estrogens, esterified	ORG.
All other estrogens	ORG.
Progestogens:	
Alprostadil	UPJ.
Dinoprostone	UPJ.
Hydroxyprogesterone caproate	UPJ.
Medroxyprogesterone acetate	X.
Megestrol acetate	UPJ.
Melengestrol acetate	UPJ.
Progesterone	UPJ.
Synthetic hypoglycemic agents:	
Acetohexamide	LIL.
Glipizide	PFZ.
Tolazamide	X.
Thyroid hormone and antithyroid agents:	
Levothyroxine, sodium	BAX.
Methimazole	LIL.
Thyroglobulin	NEP.
Thyroid	ARP.
Other hormones and synthetic substitutes:	
Calcitonin	ARP.
Corticotropin	ARP, ORG.
Danazol	SD.
Humatrope	LIL.
Insulin	LIL.
All other hormones and synthetic substitutes	PD.
*Local anesthetics:	
Benzocaine	MAL, WYK.
Butamben	WYK.
Dibucaine	CGY.
Dibucaine hydrochloride	CGY.
Lidocaine	LEM, WYK.
Lidocaine hydrochloride	LEM, WYK.
Mepivacaine	WYK.
Pramoxine hydrochloride	ABB.
Prilocaine hydrochloride	WYK.
*Renal-acting and edema-reducing agents:	
Benzothiadiazine derivatives:	
Benzthiazide	PFZ.
Chlorothiazide	MRK.
Hydrochlorothiazide	CGY, MRK, SK.
Methyclothiazide	ABB.
Trichlormethiazide	SCH.
Other renal-acting and edema-reducing agents:	
Acetazolamide	ACY.
Amiloride hydrochloride	MRK.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 19—Continued

Medicinal chemicals for which U.S. production and/or sales were reported, identified by manufactures, 1986

<i>Medicinal chemicals</i>	<i>Manufacturers' identification codes (according to list in table 20)</i>
*Renal-acting and edema-reducing agents—Continued:	
Other renal-acting and edema-reducing agents—Continued:	
Canrenoate, potassium	SRL.
Dichlorphenamide	MRK.
Probenecid	MRK, SAL.
Spironolactone	SRL.
Triamterene	GAN, SK.
*Smooth muscle relaxants:	
Aminophylline	SRL.
Atracurium besylate	BUR.
Flavoxate hydrochloride	SK.
Oxtriphylline	PD.
Theophylline sodium glycinate	CHT.
*Vitamins:	
Vitamin A:	
Beta carotene (provitamin A)	HOF.
Retinoin (vitamin A acid)	EK.
Vitamin A acetate (animal feed grade)	HOF.
Vitamin A acetate (medicinal grade)	HOF.
Vitamin A alcohol	EK, HOF.
Vitamin A palmitate (medicinal grade)	HOF.
Vitamin A propionate	HOF.
All other vitamin A	EK.
Vitamin B-Complex:	
Niacin and derivatives:	
Niacin (animal feed grade)	NEP.
Niacinamide (medicinal grade)	NEP, RIL.
Niacinamide hydroiodide	DPW.
Pantothenic acid derivatives:	
Dexpanthenol	HOF.
Panthenol	HOF.
Other B-complex vitamins:	
Biotin	HOF.
Cyanocobalamin (animal feed grade)	MRK.
Cyanocobalamin (U.S.P. crystalline)	MRK.
Riboflavin (animal feed grade)	MRK.
Riboflavin (medicinal grade)	HOF.
Thiamine hydrochloride	HOF.
Thiamine mononitrate	HOF.
Vitamin C:	
Ascorbic acid	HOF.
Sodium ascorbate	HOF.
Vitamin D:	
Cholecalciferol (vitamin D)	VTM.
Ergocalciferol (vitamin D)	VTM.
*Vitamin E:	
di-alpha Tocopheryl acetate (all grades):	
di- α Tocopheryl acetate (animal feed grade)	BAS, HOF.
di- α Tocopheryl acetate (medicinal grade)	BAS, HOF.
Other vitamin E:	
d- α Tocopherol	EKT, SCP.
di- α Tocopherol	HOF.
d- α Tocopheryl acetate	BAS, EKT, SCP.
d- α Tocopheryl acid succinate	EKT, SCP.
Vitamin K:	
Menadione sodium bisulfite:	
Menadione sodium bisulfite (anhydrous)	ABB.
Menadione sodium bisulfite (trihydrate)	ABB.
*Miscellaneous medicinal chemicals:	
Antineoplastic agents:	
Azathioprine	BUR.
Carboplatin	MRX.

SECTION 6. MEDICINAL CHEMICALS

Table 19—Continued

Medicinal chemicals for which U.S. production and/or sales were reported, identified by manufactures, 1986

<i>Medicinal chemicals</i>	<i>Manufacturers' identification codes (according to list in table 20)</i>
*Miscellaneous medicinal chemicals—Continued:	
Antineoplastic agents—Continued:	
Cisplatin	BRS, MRX.
Cytarabine	UPJ.
Fluorouracil	HOF.
Interferon	HOF.
Leuprolide acetate	ABB.
Mercaptopurine	BUR.
Procarbazine hydrochloride	BRS, HOF.
Streptozocin	UPJ.
Thioguanine (hemihydrate)	BUR.
Vinblastine sulfate	LIL.
Vincristine sulfate	LIL.
All other antineoplastic agents	SCH, X.
Cardiovascular agents:	
Antihypertensive agents:	
Captopril	TRD.
Diazoxide	SCH.
Hydralazine hydrochloride	CGY.
Methyldopa	MRK.
Metoprolol tartrate	CGY.
Minoxidil	UPJ.
Nadolol	TRD.
Prazosin hydrochloride	PFZ.
Sodium nitroprusside	ABB.
Terazosin	ABB.
Enalapril maleate	MRK.
Vasodilators:	
Amyl nitrite	FKE.
Nifedipine	PFZ.
Other cardiovascular agents:	
Digoxin	BUR.
Disopyramide phosphate	GAN, SRL.
Procainamide hydrochloride	PD, WYK.
Tocainide	MRK, SDW.
Diagnostic agents:	
Roentgenographic contrast media:	
Diatrizoate, sodium	SDW.
Iothalamate, meglumine	MAL.
Other diagnostic agents:	
Albumin	SPR.
Aminohippuric acid	WYK.
Glutamyl-p-nitroaniline (liver function test)	REG.
Metirapone	CGY.
Phenolsulfonphthalein	HYN.
Hematological agents:	
Anticoagulants:	
Ammonium heparin	SPR.
Benzalkonium heparin	RIK.
Lithium heparin	SPR.
Potassium warfarin	X.
Sodium heparin	SPR.
Warfarin	SDW.
Other hematological agents:	
Cellulose, oxidized	EKT.
Dextran	PHR.
Unclassified medicinal chemicals:	
Allopurinol	BUR.
Carbidopa	MRK.
Etidronate, disodium	NOR.
Levodopa	MON.
All other medicinal chemicals	BIB.

Source: Compiled from data received in response to questionnaires of the U.S International Trade Commission.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 20

Medicinal chemicals alphabetical directory of manufacturers by code, 1986

(Names of manufacturers that reported production and/or sales of medicinal chemicals to the U.S. International Trade Commission for 1986 are listed below in the order of their identification codes as used in table 19)

<i>Code</i>	<i>Name of company</i>	<i>Code</i>	<i>Name of company</i>
ABB	Abbott Laboratories	LLI	Lee Laboratories, Inc.
ACY	American Cyanamid Co.	MAL	Mallinckrodt, Inc.
ADC	Anderson Development Co.	MDP	Merrell Dow Pharmaceuticals Inc.
AJY	Ajay Chemicals, Inc.	MHI	Morton-Thiokol, Inc., Ventron Div.
AMD	Cyclo Products, Inc.	MON	Monsanto Co.
ARN	Arenol Chemical Corp.	MRK	Merck & Co., Inc.
ARP	Armour Pharmaceutical Co.	MRX	Johnson Matthey, Inc., Biomedical Products
ARS	Arsynco, Inc.	NEP	Nepera Inc.
BAS	BASF Corp.	NOR	Norwich Eaton Pharmaceutical, Inc.
BAX	Travenol Laboratories, Inc.	NUT	Nutrius, Inc.
BEW	Beecham, Inc.:	NSW	NutraSweet Co.
BEE	Beecham Laboratories Div.	OH	Anaquest
BEW	Beecham Western Hemisphere Inc.	ORG	Organics/LaGrange, Inc.
BIB	Beckman Instruments, Inc., Spinco Div.	ORT	Roehr Chemicals, Inc., Div. of Aceto Corp.
BKC	J.T. Baker Chemical Co.	PD	Parke-Davis Div. of Warner-Lambert Co.
BOC	Blocraft Laboratories, Inc.	PEN	CPC International, Inc., Penick Corp.
BRS	Bristol-Myers Co.	PFN	Pfanzstiehl Laboratories, Inc.
BUR	Burroughs Wellcome Co.	PFZ	Pfizer, Inc. & Pfizer Pharmaceuticals, Inc.
CGY	Ciba-Geigy Corp.	PHR	Pharmachem Corp.
CHO	Nutri Basics Co.	REG	Regis Chemical Co.
CHT	Chattam, Inc.	RIK	Riker Laboratories, Inc., Sub of 3M Co.
CPR	Certified Processing Corp.	RIL	Relly Tar & Chemical Corp.
DAN	Dan River, Inc., Chemical Products Div.	RSA	R.S.A. Corp.
DOW	Dow Chemical Co.	SAL	Salsbury Laboratories, Inc.
DPW	Deepwater, Inc.	SCH	The Schering Corp.
DUP	E.I. duPont de Nemours & Co., Inc. Medical Products Dept.	SCP	Henkel Corp.
EK	Eastman Kodak Co.:	SD	Sterling Drug, Inc.:
EKT	Tennessee Eastman Co. Div.	SD	Sterling Pharmaceuticals, Inc.
FKE	Frank Enterprises, Inc.	SDW	Sterling Organics Div.
FLM	Fleming Laboratories, Inc.	SFS	Stauffer Chemical Co., Specialty Group
GAF	GAF Corp., Chemical Group	SK	SmithKline Chemicals
GAN	Gane's Chemicals, Inc.	SPR	Scientific Protein Laboratories
GNF	General Foods Manufacturing Corp., Maxwell House Coffee Div.	SRL	G.D. Searle & Co.
HEX	Hexagon Laboratories, Inc.	TMH	Thompson-Hayward Chemical Co.
HFT	Syntex Agribusiness, Inc., Nutrition & Chemical Div.	TNA	Ethyl Corp.
HOF	Hoffmann-LaRoche, Inc.	TRD	Squibb Manufacturing, Inc.
HXL	Hexcel Corp., Hexcel Chemical Products	TX	Texaco, Inc., Texaco Chemical Co.
HYN	BBL Microbiology System	UCC	Union Carbide Corp.
IMC	International Minerals & Chemical Corp.	UPJ	Upjohn Co.
KAN	Kanasco, LTD	VTM	Vitamins, Inc.
KLM	Kalama Chemical, Inc.	WAG	West Design-Chemical, Inc.
KPT	Koppers Co., Inc.	WHL	Whitmoyer Laboratories, Inc.
LEM	Napp Chemicals, Inc.	WTL	Pennwalt Corp., Lucidol Div.
LIL	Eli Lilly & Co., U.S. and Puerto Rico	WYK	Wyckoff Chemical Co., Inc.
		WYT	Wyeth Laboratories, Inc., Wyeth Laboratories Div. of American Home Products Corp.

Note.—Complete names, telephone numbers, and addresses of the above reporting companies are listed in app. A.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

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SYNTHETIC ORGANIC CHEMICALS, 1986

SECTION 7. FLAVOR AND PERFUME MATERIALS

Eric Land

202-523-0491

Flavor and perfume materials are organic chemicals used to impart flavors and aromas to foods, beverages, cosmetics, and soaps. These aroma chemicals are also utilized to neutralize or mask unpleasant odors in industrial processes and products, as well as in consumer products.

Total domestic production of flavor and perfume materials in 1986 amounted to 138.1 million pounds (see figure 8). Sales of these materials in 1986 amounted to 96.4 million pounds (see table 21), valued at \$623.4 million, compared with 86.1 million pounds, valued at \$586.6 million, in 1985. U.S. production of flavor and perfume materials in 1986 decreased by 10.0 percent from the level in 1985 while the quantity of sales increased by 12.0 percent.

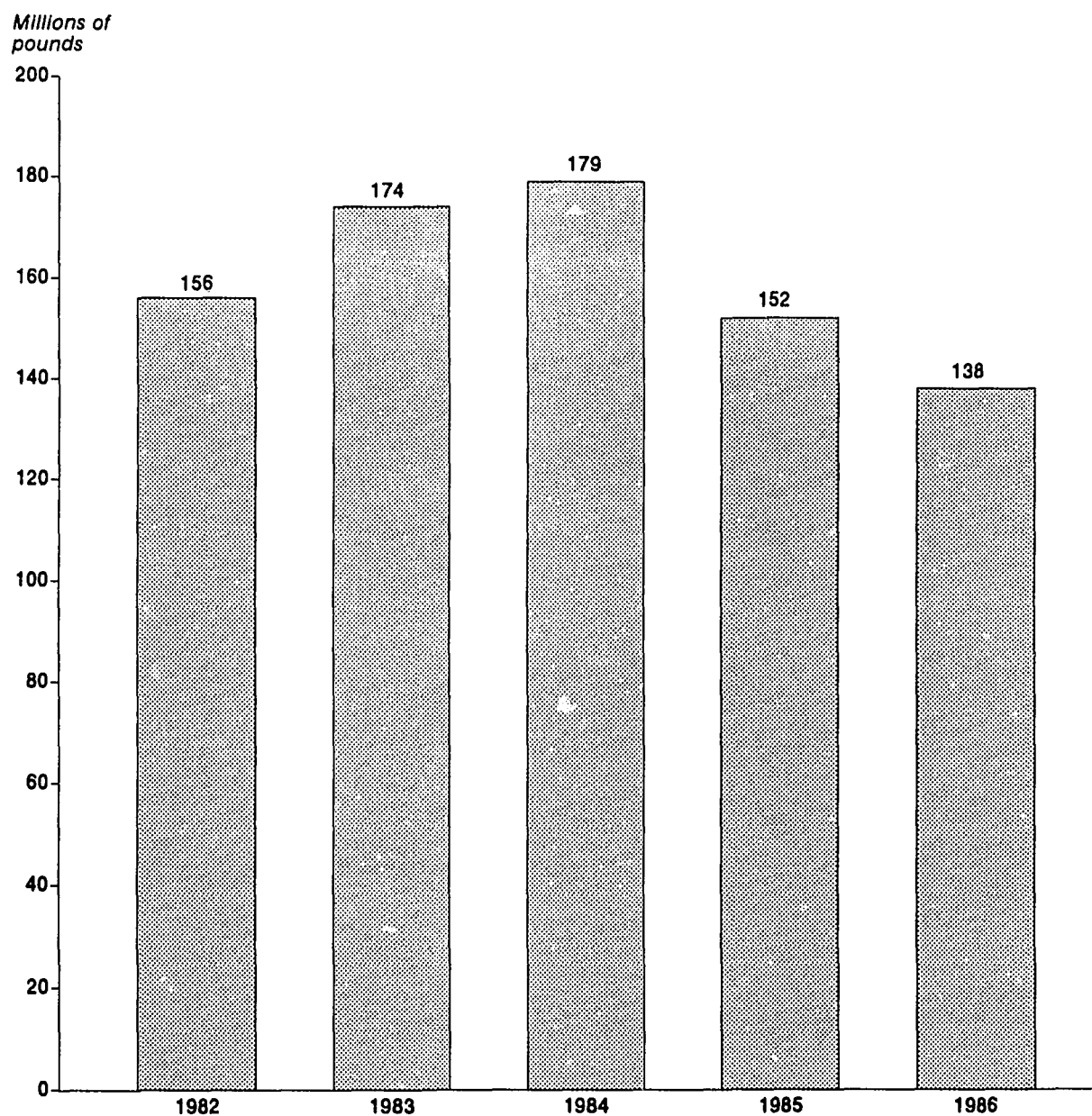
Production of cyclic flavor and perfume materials in 1986 amounted to 84.8 million pounds; sales amounted to 72.3 million pounds, valued at \$566.9 million. Individual publishable chemicals in the cyclic group produced in the greatest volume in 1986 were anethole (3.0 million pounds), benzyl acetate (286 thousand pounds), and eugenol (257 thousand pounds).

U.S. output of acyclic flavor and perfume materials in 1986 amounted to 53.3 million pounds; sales of these materials amounted to 24.1 million pounds, valued at \$56.5 million. Individual publishable acyclic flavor and perfume chemicals produced in the greatest volume in 1986 were citronellol (1.4 million pounds), tetrahydrogeraniol (671 thousand pounds), and hydroxycitronellal (311 thousand pounds).

Table 22 lists the products reported in this section and indicates the manufacturers of each by code. These codes are identified by company name in table 23.

SECTION 7. FLAVOR AND PERFUME MATERIALS

Figure 8
Flavor and perfume chemicals



Source: U.S. International Trade Commission, *Synthetic Organic Chemicals: United States Production and Sales*.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 21

Flavor and perfume materials: U.S. production and sales, 1986

(Listed below are all synthetic organic flavor and perfume materials for which any reported data on production or sales may be published. (Leaders (...)) are used where the reported data are accepted in confidence and may not be published or where no data were reported.) Table 22 lists all flavor and perfume materials for which data on production and/or sales were reported and identifies the manufacturers of each)

Flavor and perfume materials	<i>Sales</i>			Unit value ¹
	<i>Production</i>	<i>Quantity</i>	<i>Value</i>	
	<i>1,000</i>	<i>1,000</i>	<i>1,000</i>	<i>Per</i>
	<i>pounds</i>	<i>pounds</i>	<i>dollars</i>	<i>pound</i>
Grand total	138,130	96,443	623,446	\$6.46
Cyclic				
Total	84,818	72,335	566,944	7.84
Benzenoid and naphthalenoid				
Total	70,251	61,742	517,831	8.39
4-Allyl-2-methoxyphenol (Eugenol)	257	82	306	3.72
Benzyl acetate	286	...	...	...
Benzyl propionate .....	...	38	76	2.00
cis-3-Hexenyl salicylate	18	16	375	24.20
Phenethyl isobutyrate	11	...	...	...
2-Phenethyl phenylacetate	18	16	91	5.53
Phenylacetaldehyde, dimethyl acetal	119	127	542	4.26
3-Phenylpropyl acetate	8	...	...	...
p-Propenylanisole (Anethole)	3,024	3,475	8,047	2.32
All other benzenoid and naphthalenoid materials ..	66,510	57,988	508,394	8.77
Terpenoid, heterocyclic, and acyclic				
Total	14,567	10,593	49,113	4.64
Cedryl acetate	167	128	688	5.37
Ionones	77	91	833	9.18
Vetiveryl acetate	8	8	378	50.26
All other terpenoid, heterocyclic, and acyclic materials	14,315	10,366	47,214	4.55
Acyclic				
Total	53,312	24,108	56,502	2.34
Citronellyl acetate .....	...	79	295	3.73
Citronellyl formate	17	16	163	10.50
3,7-Dimethyloctanol-1 (Tetrahydrogeraniol)	671	180	622	3.46
Dimethyloctanyl acetate	6	6	59	9.68
3,7-Dimethyl-6-octen-1-ol (Citronellol)	1,418	...	...	...
Ethyl hexanoate	21	11	54	4.68
Geranyl acetate	136	108	455	4.23
Geranyl formate	18	13	92	7.21
7-Hydroxy-3,7-dimethyl-1-octanal (Hydroxycitronellal)	311	...	...	...
Isopentyl butyrate	112	106	235	2.21
Isopentyl isovalerate	19	...	...	...
All other acyclic materials	50,583	23,589	54,527	2.31

¹ Calculated from unrounded figures.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

SECTION 7. FLAVOR AND PERFUME MATERIALS

Table 22

Flavor and perfume materials for which U.S. production and/or sales were reported identified by manufacturer, 1986

(Chemicals for which separate statistics are given in Table 21 are marked below with an asterisk (*); chemicals not so marked do not appear in Table 21 because the reported data are accepted in confidence and may not be published. Manufacturers' identification codes shown below are taken from Table 23. An "X" signifies that the manufacturer did not consent to his identification with the designated product)

<i>Flavor and perfume materials</i>	<i>Manufacturers' identification codes (according to list in table 23)</i>
Cyclic	
Benzenoid and naphthalenoid:	
Acetaldehyde, diphenethyl acetal (Phenylethyl acetal)	GIV.
Acetaldehyde, ethyl phenethyl acetate	IFF.
Acetaldehyde, phenethyl propyl acetal	IFF.
2'-Acetonaphthone (β -Methyl naphthyl ketone)	GIV.
1-Acetoxy-2-sec-butyl-1-ethylcyclohexane	GIV.
p-Allylanisole	SCM, X.
4-Allyl-1,2-dimethoxybenzene (4-Allylveratrol)	CI.
*4-Allyl-2-methoxyphenol (Eugenol)	BDS, CI, ELN, FB, GIV, IFF.
4-Allyl-2-methoxyphenol acetate (Eugenol acetate)	CI.
Amyl cinnamyl alcohol	IFF.
Amyl salicylate	TCH.
p-Anisaldehyde	FB.
Anisyl acetate	ELN, GIV.
Aurantiol	BDS.
Benzaldehyde glyceryl acetate	GIV, FB.
Benzaldehyde propylene glycol acetate	FB.
Benzophenone	CWN, PD.
*Benzyl acetate	FB, MON, MRF, TCH.
Benzyl benzoate	MON, MRF, TCH.
Benzyl butyrate	ELN, FB.
Benzyl cinnamate	FB.
Benzyl formate	ELN, FB.
Benzyl isobutyrate	ELN.
Benzyl isopentyl ether	GIV.
Benzyl isovalerate	ELN, FB.
Benzyl laurate	GIV.
1-(Benzyloxy)-2-methoxy-4-propenylbenzene (Benzyl-isoeugenyl ether)	GIV.
Benzyl phenylacetate	ELN, GIV.
*Benzyl propionate	ELN, IFF, FB.
Benzyl salicylate	FB, MON, TCH.
4-tert-Butyl-2',6'-dimethyl-3',5'- dinitroacetophenone (Musk ketone)	GIV.
p-tert-Butyl- α -methylhydrocinnamaldehyde	GIV.
N-(3-(p-tert-butylphenyl)-2-methylpropylidene)- anthranilic acid, methyl ester	GIV.
1-tert-Butyl-3,4,5-trimethyl-2,6-dinitrobenzene (Musk tibetene)	GIV.
5-tert-Butyl-2,4,6-trinitro-m-xylene (Musk xylol)	GIV.
Carvacrol	GIV.
Cineole (Eucalyptol)	NCI, SCM.
Cinnamaldehyde	CI, FB.
Cinnamic aldehyde dimethyl acetal	CI.
Cinnamyl acetate	ELN, FB.
Cinnamyl alcohol	FB.
Cinnamyl butyrate	FB.
Cinnamyl cinnamate	FB.
Cinnamyl nitrile	IFF.
Cinnamyl proplonate	ELN.
Coumarin	RDA.
Cumyl acetate	IFF.
Cumyl alcohol	GIV, IFF.
Cumyl formate	IFF.
2,4-Dibromo-6-nitro-m-cresyl methyl ether	GIV.
Dihydrocoumarin	ARS.
1,2-Dimethoxy-4-propenylbenzene (4-Propenylveratrol)	FB, CI.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 22—Continued

Flavor and perfume materials for which U.S. production and/or sales were reported identified by manufacturer, 1986

<i>Flavor and perfume materials</i>	<i>Manufacturers' identification codes (according to list in table 23)</i>
Cyclic—Continued	
Benzenoid and naphthalenoid—Continued	
γ ,4-Dimethyl-3-cyclohexene-1-propanol	CI.
3,7-Dimethyl-1,6-octadien-3-yl formate	GIV.
3,7-Dimethyl-2,6-octadienyl phenylacetate	
Geranyl phenylacetate	GIV.
α , α -Dimethylphenethyl acetate	IFF.
Dimethyl phenylethyl carbinol	IFF.
p-Ethoxybenzaldehyde	GIV.
N-(p-Ethoxycarbonylphenyl)-N'-ethyl-N-phenylformamide	GIV.
2-Ethoxynaphthalene	GIV.
Ethyl anthranilate	FB.
Ethyl benzoate	ELN.
Ethyl cinnamate	ELN.
Ethyl- α , β -epoxy- β -methylhydrocinnamate	ELN.
2-Ethyl hexyl salicylate	FEL, MON.
Ethyl phenylacetate	GIV.
Ethyl salicylate	FB.
Geranyl benzoate	GIV.
Hellotrope acetate	IFF.
Hellotrope acetone	AMB.
*cis-3-Hexenyl salicylate	BDS, GIV, IFF.
α -Hexylcinnamaldehyde	CI, FB.
Hydratropaldehyde	CI, GIV.
Hydratropaldehyde, dimethyl acetal	GIV, IFF.
Hydrocinnamic acid	ELN.
Hydrocoumarin	ELN, GIV.
Hydroxycitronellal methyl anthranilate	GIV, IFF.
4-Hydroxy-3-ethoxybenzaldehyde (Ethylvanillin)	RDA.
4-Hydroxy-3-methoxybenzaldehyde (Vanillin)	MON, RDA.
4-(4-Hydroxy-3-methoxyphenyl)-2-butanone (Vanillylacetone)	GIV.
p-Hydroxy phenylbutanone	GIV.
Isoamyl phenylacetate	ELN.
Isobutyl benzoate	ELN.
Isobutyl phenylacetate	ELN, FB.
Isobutylquinoline	IFF.
Isobutyl salicylate	FB.
Isopentyl benzoate	GIV.
Isopentyl salicylate	FB, MON.
p-Isopropyl- α -methylhydrocinnamaldehyde (Cyclamen aldehyde)	GIV, RDA.
l-Limonene	SCM.
Linalyl anthranilate	BDS, FMT.
p-Mentha-1,8-diene (Limonene)	IFF.
Methyl anthranilate	HPC.
o-Methoxycinnamic aldehyde	FB.
p-Methoxybenzyl alcohol (Anisyl alcohol)	ELN, GIV.
o-Methoxycinnamic aldehyde	FB.
2-Methoxynaphthalene	GIV.
1-p-Methoxyphenyl penten-1-one-3 (α -Methyl-anisylacetone)	GIV.
3-(2-Methoxyphenyl)-2-propenal	CI.
2-Methoxy-4-propenylphenol (Isoeugenol)	CI.
2-Methoxy-4-propenylphenol, acetate	ELN.
2-Methoxy propyl phenol	CI.
4'-Methylacetophenone	CWN.
p-Methylanisole	GIV.
Methyl anthranilate	FB, PSG.
β -Methylbenzene propanal	CI.
Methyl benzoate	KLM.

SECTION 7. FLAVOR AND PERFUME MATERIALS

Table 22—Continued

Flavor and perfume materials for which U.S. production and/or sales were reported identified by manufacturer, 1986

<i>Flavor and perfume materials</i>	<i>Manufacturers' identification codes (according to list in table 23)</i>
Cyclic—Continued	
Benzenoid and naphthalenoid—Continued	
α-Methylbenzyl acetate (Styralyl acetate)	CI, IFF.
Methyl-p-tert-butyl phenylacetate	FB.
α-Methylcinnamaldehyde	CI, FB.
Methyl cinnamate	FB.
6-Methylcoumarin	GIV.
1,2-Methylenedioxy-4-propylene benzene (Iso-Safrole) ...	AMB.
1-(2-Methylethoxy)-4-methylbenzene	TCH.
p-Methylhydrotropaldehyde	GIV.
1-Methyl-isoheptyl-hexahydrobenzaldehyde	GIV.
Methyl N-methylantranilate	AMB.
α-Methyl-3,4-methylene dioxyhydrocinnamaldehyde	GIV.
Methyl phenylacetate	ELN, FB.
3-Methyl-5-phenyl-1-pentanol	IFF.
Methyl salicylate	KLM, MON.
1,1,3,3,5-Pentamethyl-4,6-dinitroindan (Moskene)	GIV.
α-Pentylcinnamaldehyde	CI, FB.
Phenethyl acetate	BDS, FB, IFF.
Phenethyl benzoate	IFF.
Phenethyl formate	ELN, FB, IFF.
*Phenethyl isobutyrate	ELN, FB, GIV, IFF.
Phenethyl isovalerate	ELN, FB.
*2-Phenethyl phenylacetate	BDS, ELN, FB, GIV, IFF.
Phenethyl propionate	ELN, FB.
Phenethyl salicylate	GIV.
2-Phenoxyethyl isobutyrate	FB.
Phenylacetaldehyde	CI, GIV.
*Phenylacetaldehyde, dimethyl acetal	CI, ELN, GIV.
Phenylacetic acid	GIV.
Phenylacetic acid, isopentyl ester	GIV.
α-Phenylanisole	GIV.
Phenylethyl 2-methyl butyrate	SCM.
*3-Phenylpropyl acetate	ELN, FB, GIV.
3-Phenylpropyl cinnamate	FB.
Phenylpropyl formate	FB.
Piperonal (Heliotropin)	AMB.
*p-Propenylanisole (Anethole)	ARZ, FB, HPC, NCI, SCM.
p-Propylanisole (Dihydroanethole)	ELN, FB, GIV.
n-Propylidene phthalide	FB.
Sweeteners, synthetic:	
Aspartame	NSW.
Cyclohexanesulfamic acid, calcium salt (Calcium cyclamate)	ABB.
Cyclohexanesulfamic acid, sodium salt (Sodium cyclamate)	ABB.
Saccharin (1,2-Benzisothiazolin-3-one, -1,1-dioxide) ...	PSG.
Saccharin, sodium salt	PSG.
Tetramethyl octahydro acetophenone	IFF.
Tetramethyl octahydro acetyl naphthalene	IFF.
p-Tolualdehyde	GIV.
p-Tolylacetaldehyde	GIV.
p-Tolylacetate	ELN, FB.
p-Tolylisobutyrate	GIV.
p-Tolyl octanoate	IFF.
p-Tolylphenylacetate	GIV.
α-(Trichloromethyl)benzyl acetate (Rosetone)	ARS.
Trimethyl benzyl dioxane	IFF.
Trimethylcyclohexyl salicylate	ARS.
Vanillin propylene glycol acetal	FB.
All other benzenoid or naphthalenoid chemicals	IFF.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 22—Continued

Flavor and perfume materials for which U.S. production and/or sales were reported identified by manufacturer, 1986

<i>Flavor and perfume materials</i>	<i>Manufacturers' identification codes (according to list in table 23)</i>
Cyclic—Continued	
Terpenoid, heterocyclic, and alicyclic	
Acetaldehyde propyl acetal	IFF.
4-Acetoxyethyl-4-nonene	FB.
Acetyl-n-butyryl (2,3-Hexanedione)	FB.
Acetyl cedrene (Vertoflox)	BDS.
Acetyl isovaleryl (5-Methyl-2,3-hexanedione)	FB.
N-Acetyl methyl anthranilate	AMB.
Acetyl propionyl (2,3-Pentanedione)	FB.
Allo-ocimene	GIV, IFF, SCM, X.
Allyl cyclohexyl propionate	GIV.
p-tert-Amylcyclohexanone (Orivone)	IFF.
Amyris acetate	GIV.
Beta methyl ionone coeur	IFF.
2-tert-Butylcyclohexanol	IFF.
2-sec-Butylcyclohexanone	GIV.
p-tert-Butylcyclohexyl acetate (Verbeniex)	CI, IFF.
Cadinene	FB.
α-Campholenic aldehyde	SCM.
Canrenoate, potassium	IFF.
l-Carvone	SCM.
β-Caryophyllene	BDS, FB, GIV, SCM, UNG.
Caryophyllene oxide	GIV.
α-Cedrene epoxide (Andrane)	BDS, IFF.
Cedrenol	ELN, IFF.
Cedrol	ELN.
*Cedryl acetate	BDS, ELN, IFF.
Cedryl formate	IFF.
Cyclohexadecen-7-olide	IFF.
Cyclohexylcyclohexanol	GIV.
2-Cyclohexylcyclohexanone	GIV, IFF.
Cyclohexyl salicylate	FB.
Cyclopentanone	FB.
Dihydro-cyclacet	IFF.
p-Cymene	SCM.
Dihydronordicyclopentadienyl acetate (Cyclacet)	BDS, CI.
Dihydronordicyclopentadienyl propionate (Cyclaprop) (Verdyl propionate extra)	BDS, CI.
Dihydro terpineol	SCM.
Dihydroterpinyl acetate	SCM, X.
Dimethyl-α-Ionone	FB.
Dimethyl cyclohexane methanol	IFF.
2,6-Dimethylheptan-2-ol	GIV.
2,2-Dimethyl-3-(2-methyl-5-isopropenyl cyclopent-1- enyl)-prop-1-yl propionate	FB.
Ethylene brassylate	STG.
Fenchol	SCM.
Gualacwood acetate	ELN, FB.
Gualene	FB.
Hexadecanolide	IFF.
2-Hexyl-2-cyclopenten-1-one	FB.
3-Hydroxy-2-ethyl-4-pyrone (Ethylmaltol)	PFZ.
4-(4-Hydroxy-4-methyl pentyl)-3-cyclohexene-10- carboxaldehyde (Lyril)	IFF.
3-Hydroxy-2-methyl-4-pyrone (Maltol)	PFZ.
4-Hydroxynonanlc acid, γ-lactone (γ-Nonalactone)	ELN.
4-Hydroxyundecanolic acid, γ-lactone (γ-Undecalactone)	ELN, FB.
Ionone(α- and β-)	BDS, GIV, NCI.
α-Ionone	BDS, FB, GIV, HOF, IFF.
β-Ionone	BDS.
Isobornyl acetate	NCI.

SECTION 7. FLAVOR AND PERFUME MATERIALS

Table 22—Continued

Flavor and perfume materials for which U.S. production and/or sales were reported identified by manufacturer, 1986

<i>Flavor and perfume materials</i>	<i>Manufacturers' identification codes (according to list in table 23)</i>
Cyclic—Continued	
Terpenoid, heterocyclic, and alicyclic—Continued	
Isobornyl methyl ether	SCM.
Isobornyl propionate	ELN.
Isocamphyl cyclohexanol	GIV.
Isolongifolene epoxide	GIV.
Isomenthone	GIV.
2-Isopropylcyclohexanol	GIV.
6-Isopropyldecalone	GIV.
Isopulegyl acetate	GIV.
Lactobionic acid	ABB.
α -Limonene, synthetic	SCM.
p-Mentha-1,3-diene (α -Terpinene)	SCM.
p-Mentha-1,4-diene (γ -Terpinene)	SCM.
p-Mentha-6,8-dien-2-ol (Carveol)	FB.
p-Mentha-6,8-dien-2-one (Carvone, Carvol)	FB.
1-p-Mentha-6,8-dien-2-yl acetate (Carvyl acetate)	FB.
p-Menth-8-en-3-ol (Isopulegol)	GIV.
p-Menth-1-en-3-one (Piperitone)	GIV.
p-Menth-4-(8)-en-3-one (Pulegone)	GIV.
1-1-p-Menthen-6-yl-1-propanone	GIV.
d-Menthol	HAR, SCM.
d,l-Menthol, synthetic	GIV, HAR, NCI, SCM.
l-Menthol, synthetic	HAR.
Menthyl acetate	GIV.
l-Menthyl acetate	SCM.
Methylionone(α - and β -)	GIV, IFF, NCI.
γ -Methylionone	BDS, FB, GIV, NCI.
6-Methyl- α -ionone	BDS, GIV.
Methyl pseudolonone	FB.
Methyl-2-thiofuroate	STG.
Nopol	NCI.
Nopyl acetate	NCI, SCM.
1-Phenylsal-1,2-propanidione	STG.
Pinol	SCM.
Pinyl acetate	SCM.
Rose oxide	FB.
α -Santalol	GIV.
α -Santalyl acetate	GIV.
Sassafras oil, hydrogenated	GIV.
Terpinene-ol	SCM.
Terpineol (α - and β -)	SCM.
α -Terpineol	HPC, NCI.
α -Terpinyl acetate	GIV, IFF, NCI, SCM.
α -Terpinyl propionate	ELN.
3,3,5-Trimethyl cyclohexanol (m-Homomenthol)	ARS.
Trimethyl cyclohexene carboxaldehyde	IFF.
Trimethyl cyclohexenyl butenone	IFF.
1-(2,6,6-Trimethyl-2-cyclohexen-1-yl)-1,6-heptadien-3-one (Allyl- α -ionone)	IFF.
5-(2,2,3-Trimethylcyclopent-3-en-1-yl)-3-methylpenta-2-ol	GIV.
Trimethyl norborane methanol	FF.
α , α , 5-Trimethyl-5-vinyl-furfuryl alcohol and tetrahydro-2,2,6-trimethyl-6-vinylpyram-3-ol	GIV.
Vetivenol	GIV.
* Vetivenyl acetate	BDS, ELN, FB, GIV.
All other terpenoid, heterocyclic, or alicyclic flavor and perfume chemicals	IFF, SCM.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 22—Continued

Flavor and perfume materials for which U.S. production and/or sales were reported identified by manufacturer, 1986

<i>Flavor and perfume materials</i>	<i>Manufacturers' identification codes (according to list in table 23)</i>
Acyclic	
Allyl disulfide	IFF.
Allyl heptanoate	ELN, FB.
*Allyl hexanoate	ELN, FB.
Ammonium isovalerate	RSA.
Amyl vinyl carbonyl acetate	IFF.
3-Bromo-propyl-amine hydrobromide	HPC.
Butyl butyryl lactate	ELN.
Butyl undecylenate	FB, GIV.
Citral dimethyl acetal	CI, IFF.
Citronellal	HPC.
*Citronellyl acetate	BDS, ELN, FB, GIV, IFF, NCI, SCM.
Citronellyl ethyl ether	IFF.
*Citronellyl formate	BDS, ELN, GIV, IFF.
Citronellyl isobutyrate	ELN, GIV, IFF.
Citronellyl propionate	IFF.
Crude acetate mixture (Linalyl, neryl, geranyl acetates, main components)	X.
Crude caryophyllene mixture (α , β , and γ isomers)	NCI.
Decanal (Capraldehyde)	CI.
Decyl acetate	GIV.
Decylaldehyde dimethyl acetal	FB.
Diethyl acetal	FB.
Diethyl isobutyldine malonate	HPC.
Diethyl sebacate	ELN.
Diethyl succinate	ELN, MRF.
Dihexyl fumarate	FB.
Dihydrocarvone	SCM.
Dihydrolinalool	SCM.
Dihydromyrcenol	SCM.
Dihydropentamethyl indanone	IFF.
Dihydroterpinyl acetate	IFF.
1,1-Dimethoxy octane	IFF.
2,6-Dimethyl-5-hepten-1-ol	GIV.
Dimethyl hexanediol	X.
2,5-Dimethyl-3-hexyne-2,5-diol	X.
3,7-Dimethyl-trans-2,6-octadienal (Citral A, Geranial) ...	BDS, FB.
3,7-Dimethyl-2,6-octadienal (Citral A & B)	NCI, SCM.
3,7-Dimethyl-2,6-octadienenitrile	CI.
3,7-Dimethyl-cis-2,6-octadien-1-ol (Nerol)	ELN, FB, GIV, IFF, NCI, SCM.
3,7-Dimethyl-trans-2,6-octadien-1-ol (Geraniol)	ELN, FEL, GIV, IFF, NCI, SCM.
3,7-Dimethyl-1,6-octadien-3-ol (Linalool) (Linalyl alcohol)	ELN, FEL, GIV, IFF, NCI, SCM.
3,7-Dimethyl-cis-2,6-octadienol, acetate (Neryl acetate)	ELN, GIV, IFF, NCI, SCM.
3,7-Dimethyl-1,6-octadien-3-ol, acetate (Linalyl acetate)	ELN, FB, GIV, NCI, SCM.
3,7-Dimethyl-1,6-octadien-3-yl isobutyrate (Linalyl isobutyrate)	GIV.
3,7-Dimethyl-1,6-octadien-3-yl propionate (Linalyl propionate)	GIV.
Dimethyloctanal	GIV, SCM.
*3,7-Dimethyloctanol-1 (Tetrahydrogeraniol)	GIV, IFF, NCI, SCM.
3,7-Dimethyl-3-octanol	GIV, SCM.
*Dimethyloctanyl acetate	FB, GIV, IFF.
3,7-Dimethyl-6-octen-1-ol (Citronellal)	GIV, SCM.
3,7-Dimethyl-6-octenenitrile	CI.
*3,7-Dimethyl-6-octen-1-ol (Citronellol)	ELN, FB, GIV, IFF, NCI, SCM.
3,7-Dimethyl-7-octenol 70%, 6-octenol isomer 30%	GIV.
Dimethyl succinate	FB.
Dihydrolinalyl acetate	FB.
Dodecane nitrile	IFF.
Ethyl butyrate	ELN, FB, NW.
Ethyl caprate	FB.

SECTION 7. FLAVOR AND PERFUME MATERIALS

Table 22—Continued

Flavor and perfume materials for which U.S. production and/or sales were reported identified by manufacturer, 1986

<i>Flavor and perfume materials</i>	<i>Manufacturers' identification codes (according to list in table 23)</i>
Acyclic—Continued	
Ethyl formate	FB.
Ethyl heptanoate	ELN, FB, FEL.
*Ethyl hexanoate	ELN, FB, NW.
Ethyl isovalerate	ELN, FB.
Ethyl laurate	ELN, FB.
Ethyl-2-methyl butyrate	FB, HPC, SCM.
Ethyl-2 methyl pentanoate	HPC.
Ethyl myristate	ELN.
Ethyl nonanoate	ELN, FB.
Ethyl octanoate	ELN, FB.
Ethyl propionate	FB, NW.
Ethyl trimethyl cyclopentenyl buterol	FB, IFF.
Ethyl valerate	ELN.
*Geranyl acetate	BDS, CI, ELN, FB, FEL, GIV, HPC, IFF, NCI, NW, SCM.
Geranyl butyrate	ELN, FB, GIV.
Geranyl crotonate	FB.
Geranyl ethyl ether	IFF.
*Geranyl formate	BDS, ELN, GIV.
Geranyl isobutyrate	IFF.
Geranyl isovalerate	FB.
Geranyl and methyl tiglate	FMT.
Geranyl nitrile (Citralva)	IFF.
Geranyl propionate	FB.
Geranyl tiglate	FB.
Glyceryl tripropionate	HPC.
Heptanolide	FB.
Heptyl butyrate	SCM.
Heptyl formate	FB.
N-Hexanal	CI.
Hexanoic acid (Caproic acid)	SCM.
2-Hexenal	FB, GIV, SCM.
2-Hexenol	FB.
cis-3-Hexen-1-yl acetate	BDS, GIV, IFF.
cis-3-Hexenyl benzoate	BDS.
cis-3-Hexenyl butyrate	IFF, SCM.
cis-3-Hexenyl methyl carbonate	IFF.
cis-3-Hexenyl tiglate	BDS.
Hexoxyacetaldehyde dimethyl acetal	FB.
Hexyl acetate	FB.
Hexyl butyrate	FB.
α -Hexy- γ -butyrolactone	FB.
Hexyl caproate	FB.
Hexyl 2-methylbutyrate	SCM.
Hydroxycitronellol	SCM.
*7-Hydroxy-3,7-dimethyl-1-octanal (Hydroxycitronellal)	FB, GIV, IFF, SCM.
7-Hydroxy-3,7-dimethyl octanal, dimethyl acetal (Hydroxycitronellal, dimethyl acetal)	GIV.
Isobutyl acetate	FB, NW.
Isobutyl butyrate	FB.
Isononyl acetate	IFF.
Isopentyl acetate (Isoamyl acetate)	ELN, FB, HPC.
*Isopentyl butyrate	FB, GIV, HPC, NW.
Isopentyl caproate	FB.
Isopentyl formate	ELN, FB.
*Isopentyl isovalerate	ELN, FB, HPC.
Isopentyl propionate	FB.
Lauraldehyde	GIV, SCM.
Linalyl formate	FB.
3-Methyl-2-butenyl acetate	IFF.
2-Methylbutyl isovalerate	SCM.
Methyl butynol	X.
Methyl caproate	FB.

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Table 22—Continued

Flavor and perfume materials for which U.S. production and/or sales were reported identified by manufacturer, 1986

<i>Flavor and perfume materials</i>	<i>Manufacturers' identification codes (according to list in table 23)</i>
Acyclic—Continued	
2-Methyl decanal	IFF.
Methyl hexyl ether	SCM.
Methyl isobutyrate	HPC.
Methyl isovalerate	FB.
Methyl-2-methyl butyrate	SCM.
3-Methyl-2-[and 3]nonene nitrile	GIV.
Methyl nonen-3-oate	HPC.
Methyl-octyl aldehyde	CI.
Methylol methyl hexyl ketone	GIV.
Methyl pentynol	X.
Methyl propionate	FB.
Methyl thlobutyrate	STG.
2-Methylundecanal	CI, GIV.
2-Methyl undecanal dimethylacetal	CI.
Myrcenyl acetate	IFF.
Myristaldehyde	GIV.
Nonanal	CI.
1,3-Nonanediol acetate	ELN, GIV, IFF.
1,3-Nonanediol diacetate	SBC.
Nonyl acetate	IFF.
Nonylenic acid	HPC.
Ookmene	IFF.
Octanal	CI.
3-Octanone (Ethyl amyl ketone)	GIV.
N-Octyl acetate	FB, SCM.
Octyl formate	FB.
Octyl isobutyrate	FB.
Octyl isovalerate	GIV.
2-Pentenal	FB.
Iso-pentylacetoacetate	FB.
Pseudo linalyl acetate (Neobergamate)	IFF.
Rhodinol	FB, GIV, IFF.
Rhodinyl acetate	IFF.
Tepyl acetate	ELN.
Tetrahydro-allocimerol (50/50 mixture of tetrahydro linalol and tetrahydro-myrcenol)	X.
Tetrahydrolinalyl alcohol (Tetrahydro-linalool)	SCM.
Tetrahydromyrcenol	SCM.
Trimethyl-cyclododeca-trienyl ethanone	IFF.
3,5,5-Trimethyl hexanal	IFF.
Undecanal	CI, GIV.
9-Undecenal	GIV.
Undecenal-10	IFF.
All other acyclic flavor and perfume materials	AIP, IFF.

Source: Compiled from data received in response to questionnaires of the U.S International Trade Commission.

SECTION 7. FLAVOR AND PERFUME MATERIALS

Table 23

Flavor and perfume materials alphabetical directory of manufacturers by code, 1986

(Names of manufacturers that reported production and/or sales of flavor and perfume materials to the U.S. International Trade Commission for 1986 are listed below in the order of their identification codes as used in table 22)

<i>Code</i>	<i>Name of company</i>	<i>Code</i>	<i>Name of company</i>
ABB	Abbott Laboratories	KLM	Kalama Chemical, Inc.
AIP	Air Products & Chemicals	MON	Monsanto Co.
AMB	American Bio-Synthetics Corp.	MRF	Morfex Chemical Co., Inc.
ARS	Arsynco, Inc.	NCI	Union Camp Corp., Terpene and Aromatics Div.
ARZ	Arizona Chemical Co.	NSW	Nutrasweet Co.
BDS	Biddle Sawyer Corp.	NW	Northwestern Chemical Co.
CI	Chem-Fluer, Inc.	PD	Parke-Davis, Div. of Warner-Lambert Co.
CWN	Upjohn Co., Fine Chemical Div.	PFZ	Pfizer, Inc.
ELN	Elan Chemical Co.	PSG	PMC Specialities Group, Inc.
FB	Fritzsche Dodge & Olcott, Inc.	RSA	RSA Corp.
FEL	Felton International, Inc.	RDA	Rhone-Poulenc, Inc.
FMT	Fairmount Chemical Co., Inc.	SBC	Scher Chemicals, Inc.
GIV	Givaudan Corp.	SCM	SCM Gildco Organics
HAR	Haarmann & Reimer Corp.	STG	McCormick & Co., Inc. McCormick-Strange Div.
HOF	Hoffmann-LaRoche, Inc.	TCH	Emery Industries, Inc. Tylon Div.
HPC	Hercules, Inc.	UNG	Ungerer & Co.
IFF	International Flavors & Fragrances, Inc.		

Note.—Complete names, telephone numbers, and addresses of the above reporting companies are listed in app. A.
Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

SYNTHETIC ORGANIC CHEMICALS, 1986

SECTION 8. PLASTICS AND RESIN MATERIALS

Edward J. Taylor

202-523-3709

Plastics and resin materials are high molecular weight polymers which, at some stage in their manufacture, exist in such physical condition that they can be shaped or otherwise processed by the application of heat and pressure. The terms "plastics," "resin," and "polymers," can be (and often are) used interchangeably by the trade. Depending on the chemical composition, manufacturing process, or intended use, the commercial products may contain plasticizers, fillers, extenders, stabilizers, coloring agents, or other additives. There are about 40 to 50 basic plastics and resins which are available commercially. These basic materials are available in literally thousands of individual compounds each with its distinct properties depending on the molecular weight of the resin and the types and amounts of the additives present. Plastics materials may be molded, cast, or extruded into semifinished or finished solid forms. Resin materials may be in the form of solutions, pastes, or emulsions for applications such as protective coatings, adhesives, or paper and textile treatment.

Statistics on U.S. production and sales of synthetic plastics and resin materials for 1986 are given in table 24. U.S. production of plastics and resin materials in 1986 totaled 52,447 million pounds, or 4.9 percent more than the 49,998 million pounds produced in 1985. From 1982-86, the production of plastics and resin materials increased steadily from 38,313 million pounds in 1982 to 52,447 million pounds in 1986, or at an average, annual rate of growth of 8.2 percent (see figure 9). Sales in 1986 totaled 45,144 million pounds, valued at \$20,355 million, compared with 42,171 million pounds, valued at \$20,168 million, in 1985.

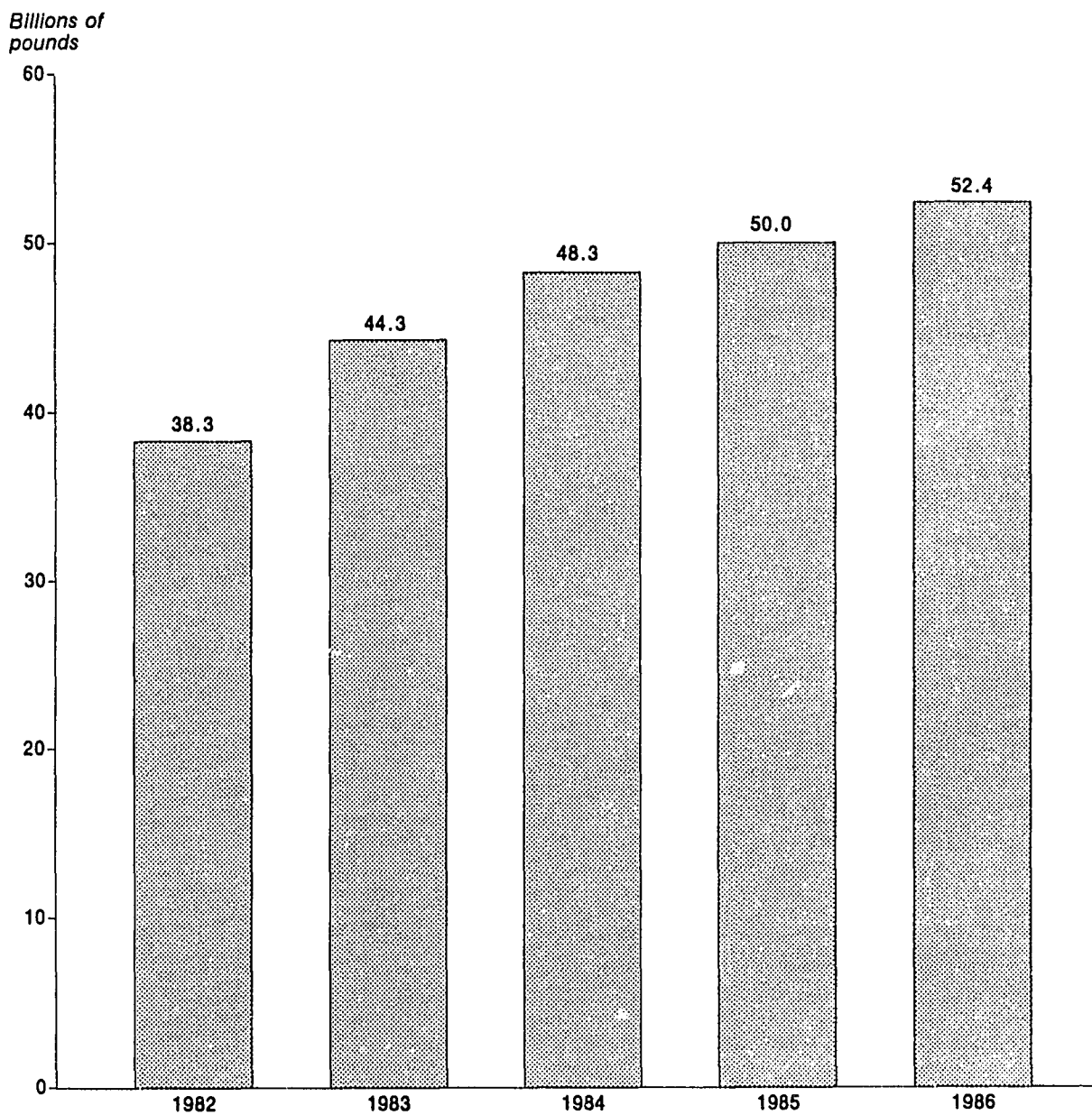
Thermosetting materials are those which harden with a change in composition in the final treatment so that in their final state as finished articles they are substantially infusible and insoluble; that is, they cannot again be softened by heat or solvents. U.S. production of thermosetting materials totaled 8,349 million pounds in 1986, compared with 8,243 million pounds in 1985. Production of the most important products in 1986 included phenolic (1,814 million pounds), amino (urea and melamine) resins (1,746 million pounds), polyester resins, unsaturated (1,319 million pounds), and alkyd resins (722 million pounds).

Thermoplastic materials are those which in their final state as finished articles can be repeatedly softened by heat and hardened by a decrease in temperature. U.S. production of thermoplastic materials totaled 44,098 million pounds in 1986 (or 84.1 percent of the total plastics and resin materials output for 1986), compared with 41,755 million pounds in 1985. Production of the most important products in 1986 included polyethylene (16,392 million pounds), polypropylene (6,256 million pounds), vinyl resins (8,829 million pounds), and styrene type materials (7,078 million pounds).

Table 25 lists the products reported in this section and indicates the manufacturer(s) of each by code. These codes are identified by company name in table 26.

SECTION 8. PLASTICS AND RESIN MATERIALS

Figure 9
Plastics and resin materials



Source: U.S. International Trade Commission, *Synthetic Organic Chemicals: United States Production and Sales*.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 24
Plastics and resin materials: U.S. Production and sales, 1986

(Quantities and values are given in terms of the total weight of the materials (dry basis). Listed below are all plastics and resin materials, urethane type elastomers, and certain precursors for which any reported data on production or sales may be published. (Leaders (...)) are used where the reported data are accepted in confidence and may not be published or where no data were reported.) Table 25 lists all products for which data on production and/or sales were reported and identifies the manufacturers of each)

Plastics and resins materials	Production ¹ 1,000 pounds dry basis ²	Sales		Unit value ¹ Per pound
		Quantity 1,000 pounds dry basis ²	Value 1,000 dollars	
Grand total	52,446,675	45,144,087	20,354,788	\$0.45
Thermosetting resins				
Total	8,348,866	6,841,123	3,757,872	.55
Alkyd resins, total	722,172	472,577	301,634	.64
Phthalic anhydride type	613,344	410,785	251,935	.61
Polybasic acid type	37,822	19,670	17,064	.87
Styrene-alkyds or copolymer alkyds	13,744	7,623	6,078	.80
Vinyl toluene alkyds	26,412	26,911	18,619	.69
All other alkyd resins	30,850	7,588	7,938	1.05
Dicyandiamide resins (an amino resin)	2,130	2,015	2,087	1.04
Epoxy resins: ^{3 4}				
Unmodified	433,272	349,746	380,666	1.09
Advanced	(276,376)	(146,557)	(203,629)	(1.38)
Furfuryl type resins	17,873	17,696	13,131	.74
Glyoxal-formaldehyde resins	21,705	...	...	...
Melamine-formaldehyde resins (an amino resin)	215,399	187,474	162,062	.86
Phenolic and other tar acid resins	1,813,507	1,310,035	664,696	.51
Polyester resins, unsaturated ⁵	1,319,124	1,194,708	708,970	.59
Polyether and polyester polyols for urethanes ⁶	1,780,188	1,475,474	795,958	.54
Polyurethane elastomers and plastics products, total	278,988	181,484	307,070	1.69
Elastomers ⁷	113,821	95,053	200,114	2.11
Plastics	165,167	86,431	106,956	1.24
Urea-formaldehyde resins (an amino resin)	1,530,652	1,490,405	230,896	.15
All other thermosetting resins ⁸	213,856	159,509	190,702	1.20
Thermoplastic resins				
Total	44,097,809	38,302,964	16,596,916	.43
Acrylic resins, total⁹	1,393,897	1,018,148	1,082,668	1.06
Butyl acrylate-ethyl acrylate copolymers resins ...	77,122	...	...	...
Homopolymer resins, except PMMA, of acrylic or methacrylic acid esters	93,273	25,871	32,385	1.25
Polymethyl methacrylate (PMMA) resins	475,429	330,204	345,319	1.05
Thermosetting acrylic resins	112,748	26,247	27,522	1.05
All other acrylic resins	635,325	635,826	677,442	1.07
Engineering plastics ¹⁰	765,089	648,767	1,024,622	1.58
Petroleum hydrocarbons resins	274,869	253,230	126,023	.50
Polyamide resins, total	477,129	420,625	613,612	\$1.46
Nylon type ^{10 11}	407,832	350,894	550,024	1.57
Non-nylon type	69,297	69,731	63,588	.91

See footnotes at end of table.

SECTION 8. PLASTICS AND RESIN MATERIALS

Table 24—Continued

Plastics and resin materials: U.S. Production and sales, 1986

<i>Plastics and resins materials</i>	<i>Production</i>	<i>Sales</i>		<i>Unit value¹</i>
		<i>Quantity</i>	<i>Value</i>	
	<i>1,000 pounds dry basis²</i>	<i>1,000 pounds dry basis²</i>	<i>1,000 dollars</i>	<i>Per pound</i>
Thermoplastics resins—Continued				
Polyester resins, saturated, total ^{9 12}	1,746,116	1,287,130	1,025,254	.80
Polyethylene terephthalate (PET)	1,427,486	1,035,804	759,359	.73
All other saturated polyesters, including Polybutylene terephthalate, (PBT) resins	318,630	251,326	265,895	1.06
Polyethylene resins, total	16,391,993	15,167,081	4,613,674	.30
Ethylene-vinyl acetate and other copolymer resins	408,993	403,456	204,186	.51
Specific gravity 0.940 and below ¹³	8,875,702	8,001,166	2,545,760	.32
Specific gravity over 0.940	7,107,298	6,762,459	1,863,728	.28
Polypropylene resins	6,256,483	4,874,047	1,578,385	.32
Polyterpene resins	35,919	33,295	28,184	.85
Polytetrafluoroethylene (PTFE) resins	26,807	21,922	123,635	5.64
Rosin modifications, total	417,624	319,559	158,879	.50
Modified rosin (unesterified)	176,325	161,851	54,257	.34
Modified rosin esters	128,721	121,328	82,262	.68
Rosin esters, unmodified (Ester gums)	112,578	36,380	22,360	.61
Styrene plastics materials, total	7,078,437	6,067,241	2,968,433	.49
Acrylonitrile-butadiene-styrene terpolymer (ABS) resins	1,138,608	1,095,091	814,213	.74
Expandable polystyrene beads .....	...	427,753	234,079	.55
Methyl methacrylate-butadiene-styrene (MBS) resins and certain other styrene copolymer and terpolymer resins	194,511	176,089	188,037	1.07
Rubber modified polystyrene	1,320,215	1,309,403	450,392	.34
Straight polystyrene	2,796,112	1,989,711	643,947	.32
Styrene-acrylonitrile copolymer (SAN) resins	184,968	81,674	49,847	.61
Styrene latexes, total	729,443	658,349	352,670	.54
Styrene-butadiene latexes	688,181	621,156	329,935	.53
All other styrene latexes	41,262	37,193	22,735	.67
All other styrene plastics materials ¹⁴	714,580	329,171	233,248	.71
Vinyl resins, total ¹⁵	8,828,555	7,946,387	2,833,377	.36
Polyvinyl acetate ¹⁶	691,516	556,908	296,133	.53
Polyvinyl chloride and copolymers	7,283,553	6,641,608	1,983,381	.30
Polyvinylidene chloride resins, latex type	20,253	25,591	21,440	.84
Vinyl acetate-acrylate copolymers	378,516	351,328	140,175	.40
All other vinyl and vinylidene resins ¹⁷	454,717	370,952	392,248	1.06
All other thermoplastic resins ¹⁸	405,091	245,532	422,170	1.72

¹ Calculated from unrounded figures.

² Dry weight basis unless otherwise specified. Dry weight basis is the total weight of the materials including resin and coloring agents, extenders, fillers, plasticizers, and other additives, but excluding water and other liquid diluents unless they are an integral part of the materials.

³ Includes reactive diluents which are an integral part of the resin. Excludes the weight of hardeners sold in association with the resin as part of a two-component system.

⁴ Data shown for advanced epoxy resins are that part of the unmodified epoxy resins which is further processed; therefore, the total in parentheses are not included in the grand total.

⁶ Polyester resins are unsaturated alkyd resins, later to be copolymerized with a monomer (Such as styrene or methyl methacrylate), and polyallyl resins (such as diallyl phthalate and diglycol carbonate). Data are on an "as sold" basis, including monomer if part of the resin system.

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Footnotes for table 24—Continued

⁶ In addition to the polyols, the other principal starting materials used in the production of urethane products are the isocyanic acid derivatives, mainly the 80/20 mixture of toluene-2,4- and 2,6-diisocyanate. Statistics for the isocyanic acid derivatives are reported in the "Cyclic Intermediates" section of the Synthetic Organic Chemicals report.

⁷ The data on urethane elastomers are believed to be not fully representative of the total urethane market in view of the very large number of urethane elastomer producers. The commission has begun reporting statistics for urethane elastomers in two sections, section VIII, plastics and resin materials, and section X, elastomers (synthetic rubber). Henceforth those polyurethane products classified as "thermoplastic" urethane elastomers will be reported in SOC section X; all other urethane elastomers will remain in SOC section VIII.

⁸ Includes acetone-formaldehyde resins, glyoxal-formaldehyde resins/sales only, polybutadiene resins, silicone resins, thiourea resins, and certain other thermosetting resins.

⁹ Does not include production or sales for fiber use.

¹⁰ Engineering plastics: Includes acetal, polycarbonate, polyimide and amide-imide polymers, polyphenylene oxide, polyphenylene sulfide and polysulfone. Engineering plastics are defined in *Whittington's Dictionary of Plastics*, as "All plastics, with or without fillers or reinforcements, which have mechanical, chemical and thermal properties suitable for use in construction, machine components and chemical processing equipment." The above list of plastics (all of which are thermoplastic) was selected from a larger group in this source. Certain other plastics named in *Whittington's Dictionary* as engineering plastics, such as ABS resins, acrylic resins, and nylon resins, are not included in the above list as they are published separately.

¹¹ Statistics for nylon 6 and nylon 6/6 which are used in plastics applications (e.g., molding, etc.) are included here.

¹² Statistics are included here for polyethylene terephthalate used in plastics applications (e.g., molding, etc.) Statistics also are included here for production only when the starting materials are converted directly to a finished product (i.e., "in situ" production); polyester film and tape are examples of such a conversion.

¹³ Combines conventional low density polyethylene (LDPE) resins with linear low density polyethylene (LLDPE) resins, because several of the leading producers of LLDPE still continue to aggregate these data with that of LDPE. See table 25 for a listing of those firms that reported production and/or sales data for LLDPE resins to the commission in 1986.

¹⁴ Includes data for expandable polystyrene beads (production only) *o*-methyl styrene polymers, styrene-allyl alcohol copolymer resins, styrene-divinylbenzene copolymer resins, styrene-maleic anhydride copolymers resins, styrene-methyl methacrylate copolymers resins, and other styrene type plastics material.

¹⁵ Data are on the basis of dry resin content, excluding the weight of plasticizers, extenders, fillers coloring agents, stabilizers, or impact modifiers, unless otherwise noted.

¹⁶ Data for polyvinyl acetate produced and sold in latex form includes the weight of any protective colloids which are used as emulsion stabilizers and form an integral part of the resin system. Production and sales do not include polyvinyl acetate used as a reactive intermediate for polyvinyl alcohol or other vinyl resins.

¹⁷ Includes polyvinyl alcohol, polyvinyl butyral, polyvinyl formal, polyvinylidene chloride (solid type), and other vinyl resins.

¹⁸ Includes cellulose plastics, coumarone-indene resins, fluorocarbon resins (except PTFE), phenoxy resins, polybutylene type resins, polyphenyl aromatic ester resins, and other thermoplastic materials.

Note.—Data reported to the U.S. International Trade Commission do not necessarily coincide with that reported to the Society of the Plastics Industry (SPI) because of differences in both the reporting instructions and in the coverage of certain resins.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

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SECTION 8. PLASTICS AND RESIN MATERIALS

Table 25

Plastics and resin materials for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1986

(Chemicals for which separate statistics are given in table 24 are marked below with an asterisk (*); chemicals not so marked do not appear in table 24 because the reported data are accepted in confidence and may not be published. Manufacturers' identification codes shown below are taken from table 26. An "X" signifies that the manufacturer did not consent to his identification with the designated product.)

<i>Plastics and resin materials</i>	<i>Manufacturers' identification codes (according to list in table 26)</i>
Thermosetting resins	
Acetone-formaldehyde resins	ACY, FLH, GP.
*Alkyd resins:	
Alkyd-acrylate copolymer resins	DRR, FRE, GLD, KMC, MNP, PPG, SW.
Alkyl phenol	X.
*Phthalic anhydride type alkyd resins	ACO, ACY, ASH, AZS, BAL, BEN, BLC, BRU, CCC, CEI, CGL, CJO, CPV, DRC, DSO, DUP, ENP, EW, FJI, FOC, FRE, GEI, GLD, GRG, GRV, HAN, ICF, IOV, JOB, JSC, KMC, KMP, LIC, MCC, MID, MNP, NCP, NTL, OBC, PER, PPG, PRT, QCP, RCI, REL, REZ, SCN, SDH, SRY, SW, TNA, USS, X, X.
*Polybasic acid type alkyd resins	ACY, BEN, CJO, CPV, DSO, FJI, FOC, GEI, GLD, HAN, ICF, IOV, MCC, NTL, PPG, RCI, REL, SCN, SW.
*Styrenated-alkyds, or copolymer alkyds	BLS, CJO, CPV, DSO, EW, FRE, GEI, GLD, JOB, MNP, MRT, NTL, REL, RUO, SW.
*Vinyl toluene alkyds	BLC, CGL, CJO, CPV, FJI, FRE, GEI, GLD, JOB, MCC, MNP, OBC, PPG, PRT, REL, SW.
*All other alkyd copolymers,	CGL, GEI, MCC, MNP, PPG, SW.
*Dicyandiamide resins	CMP, ECC, JSC, S, SNW, STC, WPG.
Amino resins:	
*Melamine-formaldehyde resins	ACY, AUX, BOR, CBD, CGL, CPV, DGO, GP, GRG, JSC, LIC, MNP, MON, NCJ, PLS, PMC, PPG, PPL, PST, RCI, REL, REZ, SNW, STC, UTC, WPG, WRD, X.
Thiourea-formaldehyde resins	CMP.
*Urea-formaldehyde resins	ACY, AUX, BOR, CBD, CCC, CGL, CMP, CPV, DAN, DSO, GAF, GP, GRV, JSC, MMM, MNP, MON, PKI, PMC, PPG, PPL, PST, RCI, REL, REZ, SAC, SNW, SOR, VAL, VPC, WPG, X.
All other amino resins	X.
*Epoxy resins:	
*Epoxy, resins advanced	ASH, CGL, GCY, CJO, CNI, DSO, ENP, EW, GE, GLD, GRG, GRV, HXL, ICF, MCC, MID, MNP, MRT, OCF, PPG, RCI, REZ, SCN, SMO.
*Epoxy, resins unmodified	AZS, CGY, CLU, DOW, PPG, PRT, RCI, SHC, TMH, WLN, X.
*Furfuryl type resins	ACR, CEI, CLU, DRR, HVG, NCP, UNO, WRD.
*Glyoxal-formaldehyde resins	AUX, RBI, RTC, SNW, STC, WPG.
*Phenolic and other tar acid resins	ABS, ACR, ADC, ASH, BME, BOR, BSC, BTL, CBD, CEI, CLU, DRR, DSO, EW, GE, GEI, GP, GRG, HAN, HER, HKD, HPC, HVG, ICF, INL, IRI, KPT, MCA, MID, MMM, NCI, NCP, NTC, NTL, OBC, OCF, PAI, PKI, PLS, PPG, PPL, PSL, RAB, RCI, RH, SPL, STC, SW, UCC, UNO, USR, VPC, VSV, WCA, WRD, X, X, X.
Polybutadiene resins	ATR, CCS, CNI, CRS, LC, SCN.
*Polyester resins, unsaturated, and allyl resins:	
Allyl resins	FMC, GEI, MCC, PPG.
Diallyl isophthalate	FMC, GEI.
Polyester resins, unsaturated	ACS, ACY, ADC, APH, ASH, AZS, CGL, CJO, CPV, ENP, EW, FJI, FRE, GLD, GRG, GRV, ICF, ICI, IPC, KPT, MCC, MRT, OBC, OCF, PPG, RCI, SIC, SL, SW, USS.
*Polyether and polyester polyols for urethanes	ARK, BAS, BMC, BPT, CEI, CHC, CJO, CPV, CXI, DOW, DSO, FRE, GRG, ICF, ICI, JOB, MCC, MOB, MRT, NCP, NTL, OCF, OMC, PPG, PPL, RCI, RUO, TX, UCC, UNO, WM.

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Table 25—Continued

Plastics and resin materials for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1986

<i>Plastics and resin materials</i>	<i>Manufacturers' identification codes (according to list in table 26)</i>
Thermosetting resins—Continued	
*Polyurethane elastomer and plastic products:	
*Polyurethane elastomers	ACO, ACY, ADC, ARO, BFG, BPT, CAS(E), CNI, DCC, DNS, DOW, EPI, GRD, HXL, ICF, INP, MOB, MRT, PLN, PPG, PRC, RUO, SBG, SLC, SMO, USR.
*Polyurethane resins	ARO, CGL, DSO, DUP, EEP, ENP, EW, FRE, GEI, GLD, HYC, INP, LC, MCC, MID, OMC, PEL, PVI(E), QUN, RBI, RCI, SCN, SIF, SW, USM.
Silicone resins	CJO, DCC, MCC, PEL, SPD.
*All other thermosetting resins,	ACY, BAS, CPV, DA(E), DUP, FRE, GLD, GRG, MCC, MID, MIL, REL, S, VAL, WLN, X.
Thermoplastic resins	
*Acrylic resins:	
Copolymer resins of acrylic and/or methacrylic acid resins:	
*Butyl acrylate-ethyl acrylate copolymer resins	BFG, DRB, FLH, RH, VAL.
Butyl methacrylate-ethyl methacrylate copolymer resins	UOC.
Ethyl acrylate	DSO.
2-Ethylhexyl acrylate-methyl acrylate copolymer resins	RH, UOC.
Lauryl methacrylate-stearyl methacrylate copolymer resins	TX.
Methyl methacrylate-2-ethyl hexyl	DSO.
Other copolymer resins of acrylic and/or methacrylic acid esters	ACO, AZS, BPT, CHP, CPV, DRB, DRC, DSO, GAF, GLD, ICF, JNS, JSC, MON, NSC, PPG, PYI, RH, SCP, SYT, UCC, VAL.
Homopolymer resins of acrylic and/or methacrylic acid resins:	
*Homopolymer resins of acrylic or methacrylic acid esters, except PMMA	CPV, CYR, DA(E), DUP, GRV, ICF, PPG, PVI(E), PYI, RH, SAR, SW, UOC.
*Polymethyl methacrylate (PMMA)	CTP, CYR, DUP, ICF, JOB, JSC, MRT, PKL, PPG, PTC, PVI(E), RH, SAR, SNW, USS.
Polyethyl methacrylate	TX.
*Thermosetting acrylate resins	ACY, CPV, DA(E), DSO, DUP, EFH, GRV, HAN, ICF, LIC, MID, MNP, PPG, REZ, SM, SW.
Cellulose plastics and resins:	
Cellulose acetate	EKT.
Cellulose acetate butyrate	EKT.
Cellulose acetate propionate	EKT.
Ethyl cellulose	X.
All other cellulose plastics	DUP.
Coumarone-indene resins	NEV.
*Engineering plastics:	
Acetal resins	CEL, DUP, MCC, PPG, PRT, RAS, REL.
Polycarbonate resins	DOW, GE, GRG, MCC, MOB, SNW.
Polyimides and amide-imide polymers	AMO, DUP, EW, GE, GRG, PDI.
Polyphenylene oxide type resins	GE, HAN, OBC.
Polyphenylene sulfide resins	PLC.
Polysulfone resins	UCC.
Fluorocarbon resins:	
*Polytetrafluoroethylene (PTFE)	ACS, DUP, ICI.
Polyvinylidene fluoride resin	PAS.
All other fluorocarbon resins	DUP.
*Petroleum hydrocarbon resins	CFX, CXI, EKX, ENJ, GYR, HPC, ICF, LII, NEV, RCI, X.

SECTION 8. PLASTICS AND RESIN MATERIALS

Table 25—Continued

Plastics and resin materials for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1986

<i>Plastics and resin materials</i>	<i>Manufacturers' identification codes (according to list in table 26)</i>
Thermoplastic resins—Continued	
Phenoxy (R) resin (other than for coating and adhesives)	UCC.
*Polyamide resins:	
*Non-nylon type, polyamide resins	COO, EMR, ENJ, GP, HYA, LII, MON, NCI, PAC, S, SCP, SNW, STC, SYL, USM.
*Nylon type, polyamide resins	ACS, AGI, BCM, CEL, CTR, DGO, DUP, EFH, GRG, MON, RSN, SCP, USM.
Polybutylene type resins	SHC.
*Polyester resins, saturated:	
Polybutylene terephthalate (PBT)	AGI, CEL, EKT, GAF, GE, PPG, USM.
*Polyethylene terephthalate (PET)	AGI, DUP, EK, EKT, GEI, GYR, HST, ICI, USM.
*All other polyester resins, saturated	BPT, COO, CPV, DUP, EKT, GLD, ICF, ICI, LII, MNP, PPG, SW, UCC.
*Polyethylene and copolymers resins:	
Ethylene-acrylic acid resins (EAA)	DOW.
*Ethylene-vinyl acetate (EVA) copolymer resins	ENJ, NSC, USI.
Other ethylene copolymer resins	EKT, EKX, PPG, SNW.
*Specific gravity 0.940 and below (conventional low density)	ACS, DOW, DUP, EKX, ENJ, NWP, SM, SNW, SOC, UCC, USI, X.
*Specific gravity 0.940 and below (linear low density)	ELP, ENJ, NWP, SM, USI.
*Specific gravity over 0.940	ACS, AMO, DOW, DUP, ENJ, HIM, HST, NWP, PLC, SLT, USI.
Polyphenyl aromatic ester resins	HPC.
*Polypropylene polymer and copolymer resins	AMO, CSD, EKX, ELP, ENJ, HIM, MIL, NWP, PLC, SHC, SLT, USS.
*Polyterpene resins	ARZ, HPC, RCI, SCN.
*Rosin modifications:	
*Modified rosin (unesterified)	ARZ, BLC, HPC, MON, NCI, SYL, WVA.
*Modified rosin esters	AZS, FJI, FRP, GP, GRV, HPC, LIL, MCC, NCI, RCI, STC, SW, SYL, WVA, X.
*Rosin esters, unmodified (ester gums)	ARZ, ENP, FRP, HPC, LII, NCI, PRT, RCI, SYL.
*Styrene type plastics materials:	
*Acrylonitrile-butadiene-styrene (ABS) terpolymer resins	DOW, GRD, MCB, MON.
α -Methyl styrene polymers	AMO, CPV, VAL.
*Styrene-acrylonitrile copolymer resins (SAN)	BFG, DOW, GE, MCB, MON.
Polystyrene:	
*Expandable polystyrene beads	ATR, BAS, HST, TXS, VIT.
*Rubber modified polystyrene	API, CSD, DOW, DPI, HST, MON, PLR, SM.
*Straight polystyrene	AEP, AMO, API, ATR, CSD, DA(E), DOW, DPI, GAF, GTL, HGC, HPC, HST, KTP, MON, PLR, SM, SOC, TXS.
*Styrene latexes:	
*Styrene-butadiene latexes	DOW, GNT, GRD, GYR, PYI, RCI, UOC.
*All other styrene latexes	ADC, CCS, CRS, GRD, MCC, PVI(E), SPO, UCC, UOC.
*Other styrene copolymers:	
Methyl methacrylate-butadiene-styrene (MBS) resins ...	CYR, MRT, RH.
Styrene-allyl alcohol copolymer resins	HPC, MON.
Styrene-divinylbenzene copolymer resins	RH.
Styrene-maleic anhydride copolymer resins	ATR, MON, PPG.
Styrene-methyl methacrylate copolymer resins	ADC, DSO, FLH, MCC, RCD.
All other styrene copolymers	ARZ, DOW, DSO, DUP, ENP, GYR, HPC, JNS, JSC, MON, PLC, PPG, RCD, VAL.
*All other styrene type plastics materials	JNS.
*Vinyl resins:	
Polyvinyl acetate resins	AIP, BOR, CMP, DAN, DSO, FJI, FLH, FLN, GLD, GRD, JOB, JSC, KMP, MNP, MON, NSC, PYI, RCI, SCO, SNW, UCC, UOC, X.
*Polyvinyl alcohol resins	AIP, DUP, MON.
Polyvinyl butyral resins	DUP, MON.
Polyvinyl formal resin	EW, GRG, MON.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 25—Continued

Plastics and resin materials for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1986

<i>Plastics and resin materials</i>	<i>Manufacturers' identification codes (according to list in table 26)</i>
Thermoplastic resins—Continued	
Vinyl resins—Continued	
*Vinyl acetate-acrylate copolymers	ACO, DA(E), DAN, DSO, FLH, FLN, GLD, MCC, NCJ, NTC, OBC, SNW, SPC, UCC, UOC.
*Polyvinyl chloride and copolymer resins:	
Polyvinyl chloride homopolymer resins	AIP, BFG, BOR, FOR, GGC, HKP, KYS, MIL, SHT, UCC, VST, VYN.
Vinyl chloride-acetate copolymer resins	MCC.
All other polyvinyl chloride copolymer resins	BFG, CNI, CNT, HKP, VYN.
Polyvinylidene chloride resins:	
*Latex type polyvinylidene chloride resins	BFG, DOW, GRD, UOC.
Solid type polyvinylidene chloride resins	DOW.
*All other vinyl resins	AZS, DUP, GLD, NTC, RH, UCC.
*All other thermoplastic resins	DUP, LIL, MON, SW, UOC.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

SECTION 8. PLASTICS AND RESIN MATERIALS

Table 26

Plastics and resin materials alphabetical directory of manufacturers by code, 1986

(Names of manufacturers that reported production and/or sales of plastics and resin materials to the U.S. International Trade Commission for 1986 are listed below in the order of their identification codes as used in table 25)

<i>Code</i>	<i>Name of company</i>	<i>Code</i>	<i>Name of company</i>
ABS	Abex Corp., Friction Products Div.-U.S.	CYR	CYRO Industries
ACR	CPC International, Inc., Acme Resin Corp.	CXI	Chemical Exchange Industries, Inc.
ACO	Adco Chemical Co.	DA	Diamond Shamrock Corp., Chemicals Div.
ACS	Allied Signal, Inc. Engineered Materials Sector	DAN	Dan River, Inc., Chemical Products Div.
ACY	American Cyanamid Co.	DCC	Dow Corning Corp.
ADC	Anderson Development Co.	DGO	Day-Glo Color Corp.
AEP	A & E Plastics Corp.	DNS	Dennis Chemical Co.
AGI	EMS-American Grilon, Inc.	DOW	Dow Chemical Co.
AIP	Air Products & Chemicals, Inc.	DPI	Dart Polymers, Inc.
AMO	Amoco Corp.		Sub of Dart Container Corp.
APH	Alpha Corporation of Tennessee	DRB	The Derby Co., Inc.
API	Asoma Polymers, Inc.	DRC	Dock Resins Corp.
ARK	Armstrong World Industries, Inc.	DRR	Delta Resins & Refractories
ARO	Arnco	DSO	DeSoto, Inc.
ARZ	Arizona Chemical Co.	DUP	E. I. duPont de Nemours & Co., Inc.
ASH	Ashland Oil, Inc.		Chemicals and Pigments Dept.
ATR	Atlantic Richfield Co., Arco Chemical Co.		Finishes and Fabricated Products Dept.
AUX	Auralux Corp.		Photosystems and
AZS	AZS Corp., AZS Chemical Corp.		Electronics Products Dept.
			Polymer Products Dept.
BAL	Sherwin-Williams Co., Consumers Div.	ECC	Eastern Color & Chemical Co.
BAS	BASF Corp.	EEP	Eaton Corp., Industrial Polymer Product Div.
BCM	Belding Chemical Industries	EFH	E. F. Houghton & Co.
BEN	Bennett Paint Corp.	EK	Eastman Kodak Co.:
BFG	B. F. Goodrich Co.,:	EKT	Tennessee Eastman Co. Div.
	B. F. Goodrich Chemical Group	EKX	Texas Eastman Co. Div.
BLC	Ranbar Technology, Inc.	ELP	El Paso Products Co.
	Ball Chemical Co.	EMR	Emery Chemicals
BMC	Brin-Mont Chemicals, Inc.		Div. of National Distillers & Chemical Corp.
BME	Allied Bendix Corp., Friction Materials Div.	ENJ	Exxon Chemical Americas
BOR	Borden, Inc., Borden Chemical Div.	ENP	Inslco Corp., Enterprise Companies Div.
BPT	Permethane Inc.	EPI	Ohio Rubber Co., Orthane Div.
BRU	M. A. Bruder & Sons, Inc.	EW	Westinghouse Electric Corp.,
BSC	Cascade Resins, Inc.		Insulating Materials Div.
BTL	BTL of Illinois, Inc.	FJI	Foy-Johnston, Inc.
CAS	CasChem, Inc.	FLH	H. B. Fuller Co.
CBD	Chembond Corp.	FLN	Franklin International
CCC	C.N.C. International Inc.	FMC	FMC Corp.
CCS	Colorado Chemical Specialties, Inc.	FOC	Handschy Industries, Inc.,
CEI	CastChem Inc.		Farac Varnishes & Chemicals
CEL	Celanese Corp.:	FOR	Formosa Plastics Corp.-U.S.A.
	Celanese Specialties	FRE	Freeman Chemical Corp.
CFX	Chemfax, Inc.	FRP	FRP Co.
CGL	Cargill, Inc.	GAF	GAF Corp., Chemical Group
CGY	Ciba-Geigy Corp.	GE	General Electric Co.:
CHC	Carpenter Chemical Co.		Insulating Materials
CHP	C. H. Patrick & Co., Inc.	GEI	Georgia-Gulf Corp.,:
CJO	C. J. Osborn Chemicals, Inc.		PVC Compound Div.
CLU	CL Industries, Inc.		Plaquemine Div.
CMP	Commercial Products Co., Inc.	GLC	General Latex & Chemical Corp.
CNI	Conap, Inc.	GLD	Glidden Co.
CNT	Certainfeed Corp.	GNT	Diversitech General (Gencorp Co.)
COO	H.B. Fuller	GP	Georgia-Pacific Corp.: Resins Operations
CPV	Cook Paint & Varnish Co.	GRD	W. R. Grace & Co., Polymers & Chemical Div.
CRS	Colorado Resins, Inc.	GRG	P. D. George Co.
CSD	Fina Oil & Chemical Co.,	GRV	Guardsman Chemicals, Inc.
	Cosden Chemical Div.	GTL	Great Lakes Chemical Corp
CTP	Continental Polymers, Inc.	GYR	Goodyear Tire & Rubber Co.
CTR	Custom Resins Div. of Bemis Co., Inc.		

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 26—Continued

Plastics and resin materials alphabetical directory of manufacturers by code, 1986

Code	Name of company	Code	Name of company
HAN	Hanna Chemical Coatings Corp.	OCF	Owens-Corning Fiberglas Corp.
HER	Heresite-Saekaphen, Inc.	OMC	Olin Corp.
HGC	Goodson Chemical Corp.	PAC	Pacific Anchor Chemical Corp.
HIM	Himont U.S.A., Inc. Occidental Chemical Corp.:	PAI	Polymer Applications, Inc.
HKD	Durez Div.	PAS	Pennwalt Corp.
HKP	PVC Div.	PDI	Phelps Dodge Industries, Inc., Phelps Dodge Magnet Wire Co. Div.
HPC	Hercules, Inc.	PEL	Peiron Corp.
HST	American Hoechst Corp.: Hoechst Fiber Industries Div. Petrochemicals/Plastics Group	PER	Perry & Derrick Co., Inc.
HVG	Ametek, Inc., Haveg Div.	PKI	Perkins Industries, Inc.
HXL	Hexcel Corp., Hexcel Chemical Products Dexter Corp.:	PKL	Plaskolite, Inc.
HYA	Hysol Aerospace & Industrial Products Div. Dexter Specialty Chemicals Group	PLC	Phillips Petroleum Co.
HYC	Hysol Electronic Chemicals Div., Dexter Specialty Chemicals Group	PLN	Disogrin Industries Corp.
ICF	BASF Inmont Div.	PLR	Polyar, Inc.: Plastic Div.
ICI	ICI Americas, Inc.	PLS	Plastics Engineering Co.
INL	Van Leer Containers, Inc.	PMC	Plastics Manufacturing Co.
INP	Synair Corp.	PPG	PPG Industries, Inc.
IOV	Iovite, Inc.	PPL	Sterling Engineered Products
IPC	Interplastic Corp.	PRC	Products Research & Chemical Corp.
IRI	Ironside Co.	PRT	Pratt & Lambert, Inc., Paint Div.
JNS	S. C. Johnson & Son, Inc.	PSL	Plaslok Corp.
JOB	Jones-Blair Co.	PST	Perstorp Compounds, Inc.
JSC	Sybron Chemicals, Inc.	PTC	Polycast Technology Corp.
KMC	Komac Paint, Inc.	PVI	Polyvinyl Chemical Industries
KMP	Kelly-Moore Paint Co., Inc.	PYI	Morton Thiokol, Inc. Morton Chemical Div.
KPT	Koppers Co., Inc.	QCP	Quaker Chemical Corp.
KTP	Kent Polymers, Inc.	QUN	K. J. Quinn & Co., Inc.
KYS	Keysor Century Corp.	RAB	Raymark Corp.
LC	Lord Corp., Chemical Products Group	RAS	Surface Coatings, Inc.
LIC	Lilly Industrial Coatings, Inc.	RBI	Reeves Brothers, Inc.
LII	Lawter International, Inc.	RCD	Richardson Polymer Corp.
MCA	Masonite Corp., Alpine Resin Div.	RCI	Reichhold Chemicals, Inc.
MCB	Borg-Warner Corp., Borg Warner Chemicals	REL	Reliance Universal, Inc., Louisville Resins Operations
MCC	McCloskey Corp.: McCloskey Varnish Co.: McCloskey Varnish Co. of California McCloskey Varnish Co. of Oregon	REZ	Interez, Inc.
MID	Dexter Corp., Midland Div.	RH	Rohm & Haas Co.
MIL	Milliken & Co., Milliken Chemical Co.	RSN	Atochem, Inc., Polymers Div.
MMM	Minnesota Mining & Manufacturing Co.	RTC	Riegel Textile Corp., Riechem Div.
MNP	McWhorter, Inc.	RUO	Ruco Polymer Corp.
MOB	Mobay Chemical Corp., Pittsburgh Div.	S	Sandoz, Inc., Colors & Chemicals Div.
MON	Monsanto Co.	SAC	Southeastern Adhesives Co.
MRT	Morton-Thiokol, Inc., Morton Chemical Co. Div.	SAR	Lokal, Inc.
NCI	Union Camp Corp., Chemical Products Div.	SBG	Samuel Bingham Co.
NCJ	National Casein of New Jersey	SCN	Schenectady Chemicals, Inc.
NCP	Niles Chemical Paint Co.	SCO	Scholler, Inc.
NCP	Niles Chemical Paint Co. and Kordell Industries Div.	SCP	Henkel Corp.
NEV	Neville Chemical Co.	SDH	Sterling Drug, Inc., SDI Divestiture Corp. Div.
NSC	National Starch & Chemical Corp.	SHC	Shell Oil Co., Shell Chemical Co. Div.
NTC	National Casein Co.	SHT	Shintech, Inc.
NTL	NL Industries, Inc., NL Chemicals Div	SIC	Standard Oil Co., Silmar Div., Engineered Material Co.
NWP	USI Chemicals Co. Inc.	SIF	Standard Oil Co., Flon Div., Engineered Material Co.
OBC	O'Brien Corp.	SLC	Soluol Chem Co., Inc.
		SLT	Soltex Polymer Corp.
		SM	Mobil Oil Corp.: Mobil Chemical Co.: Chemical Div. Petrochemicals Div. Products Div.

SECTION 8. PLASTICS AND RESIN MATERIALS

Table 26—Continued

Plastics and resin materials alphabetical directory of manufacturers by code, 1986

<i>Code</i>	<i>Name of company</i>	<i>Code</i>	<i>Name of company</i>
SMO	Smooth-On, Inc.	UOC	Union Oil Co. of California
SNW	Sun Chemical Corp., Chemicals Div.	USI	National Distillers & Chemical Corp.: U.S. Industrial Chemicals Co.:
SOC	Chevron Corp., Chevron Chemical Co.	USM	Emhart Corp., Bostik U.S. Div.
SOR	MW Manufacturers, Inc., Southern Resin Div.	USR	Uniroyal, Inc., Uniroyal Chemical Div.
SPC	Insilco Corp., Sinclair Paint Co. Div.	USS	U.S. Steel Corp., USS Chemicals Div.
SPD	General Electric Co., Silicone Products Dept.		
SPL	Spaulding Fibre Co., Inc., Industrial Plastics Div.	VTC	Unitex Chemical Corp.
SPO	Ameripol Synpol Co. Div. of Uniroyal Goodrich Tire Co.	VAL	United Merchants & Manufacturers, Inc., Valchem Div.
SRY	Synray Corp.	VIT	Vititek Corp.
STC	American Hoechst Corp., Sou-Tex Works	VPC	Mobay Chemical Corp., Dye & Pigment Div.
SW	Sherwin-Williams Co.	VST	Vieta Chemical Co.
SYL	Sylvachem Corp.	VSV	Valentine Sugars, Inc., Vailte Div.
SYT	Synthron, Inc.	VYN	Vygen, Inc.
TMH	Thompson Haywood Chemical Co.	WCA	West Coast Adhesives Co.
TNA	Ethyl Corp.	WLN	Wilmington Chemical Corp.
TX	Texaco, Inc. Texaco Chemical Co.	WM	Inolex Chemical Co.
TXS	Textystyrene Plastics, Inc.	WPG	West Point-Pepperell, Inc., Grifftex Chemical Co. Sub.
UCC	Union Carbide Corp.	WVA	Westvaco Corp.
UNO	United-Erle, Inc.		

Note.—Complete names, telephone numbers, and addresses of the above reporting companies are listed in app. A.
Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

SYNTHETIC ORGANIC CHEMICALS, 1986

SECTION 9. RUBBER-PROCESSING CHEMICALS

Cynthia Trainor

202-523-1255

Rubber-processing chemicals are organic compounds that are added to natural and synthetic rubber to give them qualities necessary for their conversion into finished rubber goods. In this report, statistics are given for cyclic and acyclic compounds by use—such as accelerators, antioxidants, and vulcanizing agents. Data on production and sales of rubber-processing chemicals in 1986 are given in table 27.¹ Data on production of rubber-processing chemicals during 1982–86 is given in figure 10.

Production of rubber-processing chemicals as a group in 1986 amounted to 324 million pounds, or 25 percent more than the 260 million pounds produced in 1985. Sales of rubber-processing chemicals in 1986 amounted to 235 million pounds, valued at \$297 million, compared with 174 million pounds, valued at \$281 million, in 1985.

Table 28 lists the products reported in this section and indicates the manufacturer(s) of each by code. These codes are identified by company name in table 29.

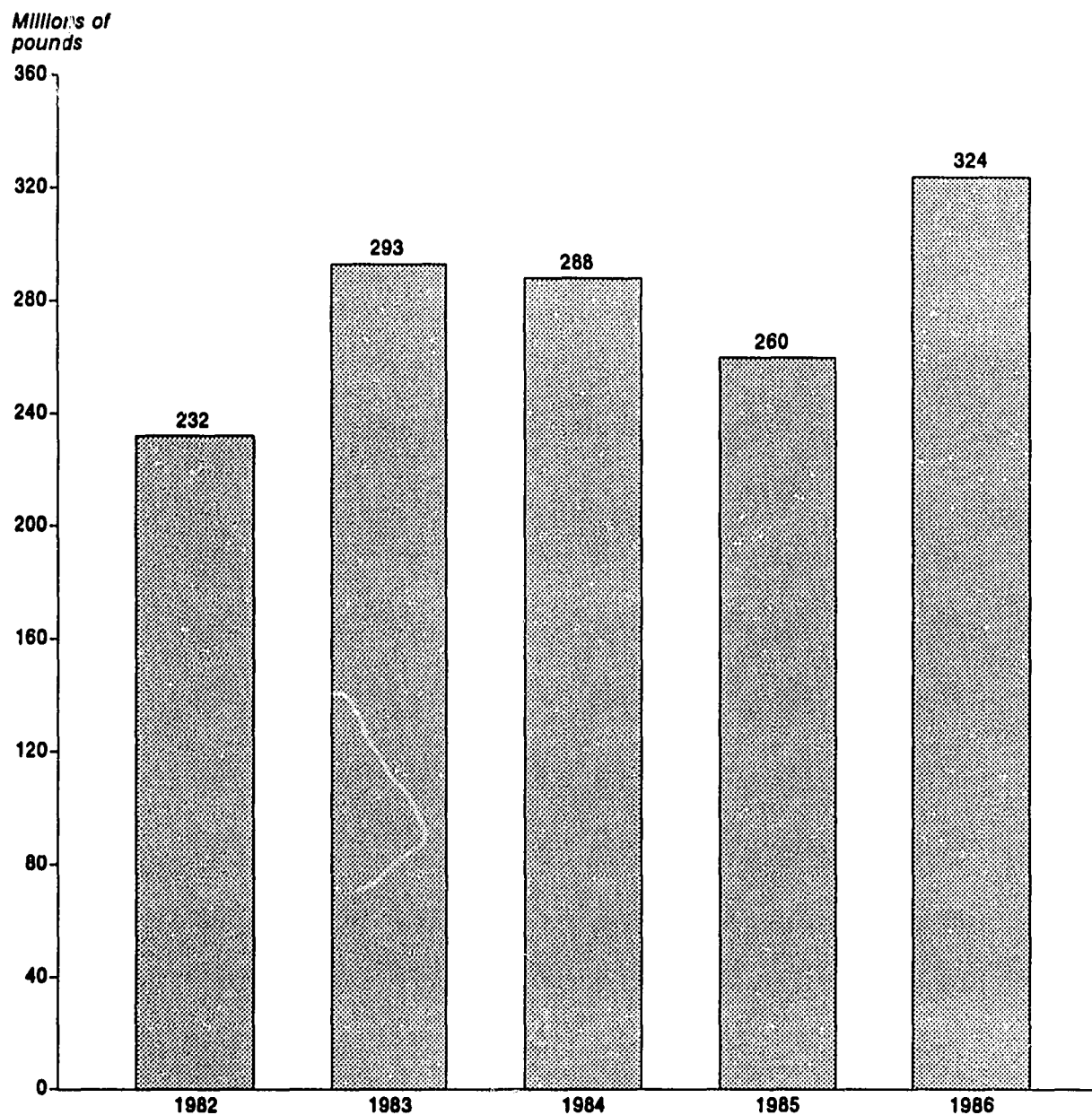
The production of cyclic rubber-processing chemicals in 1986 amounted to 297 million pounds, or 2.5 percent more than the 237 million pounds produced in 1985. Sales of cyclic rubber-processing chemicals in 1986 totaled 211 million pounds, valued at \$273 million, compared with 155 million pounds, valued at \$258 million, in 1985. Of the total production of cyclic rubber-processing chemicals in 1986, antioxidants, antiozonants, and stabilizers accounted for 61 percent, and accelerators, activators, and vulcanizing agents for 19 percent. Production of antioxidants, antiozonants, and stabilizers, which amounted to 181 million pounds in 1986, included 113 million pounds of amino compounds and 69 million pounds of phenolic and phosphite compounds. Sales of amino antioxidants, antiozonants, and stabilizers in 1986 amounted to 78 million pounds, valued at \$111 million; sales of phenolic and phosphite antioxidants, antiozonants, and stabilizers were 41 million pounds, valued at \$68 million.

Production of acyclic rubber-processing chemicals in 1986 amounted to 27 million pounds, or 19 percent more than the 23 million pounds produced in 1985. Sales in 1986 totaled 25 million pounds, valued at \$23 million, compared with 20 million pounds, valued at \$22 million, in 1985.

¹ See table 27, which lists these products and identifies the manufacturers by codes. These codes are given in table 29.

SECTION 9. RUBBER-PROCESSING CHEMICALS

Figure 10
Rubber-processing chemicals



Source: U.S. International Trade Commission, *Synthetic Organic Chemicals: United States Production and Sales*.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 27

Rubber processing chemicals: U.S. production and sales, 1986

(Listed below are all rubber-processing chemicals for which any reported data on production or sales may be published. (Leaders (...)) are used where the reported data are accepted in confidence and may not be published or where no data were reported.) Table 28 lists all rubber-processing chemicals for which data on production and/or sales were reported and identifies the manufacturers of each)

Rubber processing chemicals	Sales			
	Production	Quantity	Value	Unit value ¹
	1,000 pounds	1,000 pounds	1,000 dollars	Per pound
Grand Total	324,110	235,266	296,550	\$1.26
Cyclic				
Total	296,853	210,539	273,380	1.30
Accelerators, activators, and vulcanizing agents total	56,422	44,437	70,161	1.58
Thiazole derivatives, total	52,140	39,787	55,000	1.38
2,2'-Dithiobis[benzothiazole]	9,128	8,920	8,315	.93
All other thiazole derivatives	43,012	30,867	46,685	1.51
All other accelerators, activators, and vulcanizing agents ^{2, 3}	4,282	4,650	15,161	3.26
Antioxidants, antiozonants, and stabilizers, total	181,306	118,740	176,310	1.48
Amino compounds, total	112,604	78,126	111,434	1.43
Substituted p-phenylenediamines	72,048	41,401	68,199	1.65
All other amino compounds ⁴	40,556	36,725	43,235	1.18
Phenolic and phosphite compounds, total ⁵	68,702	40,614	64,876	1.60
Phosphites	53,548	29,066	32,842	1.13
Polyphenolics	7,108	7,149	24,524	3.43
Phenol, hindered	289	260	533	2.05
All other phenolic and phosphite compounds	7,757	4,139	6,977	1.69
All other cyclic rubber-processing chemicals ⁶	59,125	47,362	26,909	.57
Acyclic				
Total	27,257	24,727	23,170	.94
Accelerators, activators, and vulcanizing agents, total .....	...	5,026	11,322	2.25
All other acyclic rubber-processing chemicals⁷ .....	...	19,701	11,848	.60

¹ Calculated from unrounded figures.

² Includes aldehyde-amine reaction products, dithiocarbamates, guanidines, and other accelerators, activators, and vulcanizing agents.

³ Data on dithiocarbamates included in this table are for materials used chiefly in the processing of natural and synthetic rubber. Data on dithiocarbamates, which are used chiefly as fungicides, are included in the section on "Pesticides and Related Products."

⁴ Includes aldehyde- and acetone-amine reaction products and other amines.

⁵ Also includes other antioxidants, antiozonants, and stabilizers.

⁶ Includes blowing agents, peptizers, and other cyclic rubber-processing chemicals.

⁷ Includes polymerization regulators, shortstops, and other acyclic rubber processing chemicals.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

SECTION 9. RUBBER-PROCESSING CHEMICALS

Table 28

Rubber-processing chemicals for which U.S. production and/or sales were reported, identified by manufacturer, 1986

(Chemicals for which separate statistics are given in table 27 are marked below with an asterisk (*); chemicals not so marked do not appear in table 27 because the reported data are accepted in confidence and may not be published. Manufacturers' identification codes shown below are taken from table 28. An "X" signifies that the manufacturer did not consent to his identification with the designated product)

<i>Rubber-processing chemicals</i>	<i>Manufacturers' identification codes (according to list in table 29)</i>
Cyclic	
*Accelerators, activators, and vulcanizing agents:	
Aldehyde-amine reaction products:	
Heptaldehyde-aniline condensate	USR.
Tetrahydro-3,5-dimethyl-4H-1,3,5-oxadiazine-4-thione	RBC.
Triethyltrimethylenetriamine	USR.
All other aldehyde-amine reaction products, cyclic	DUP.
Dithiocarbamic acid derivatives:	
Dibenzylidithiocarbamic acid, sodium salt	USR.
Dibenzylidithiocarbamic acid, zinc salt	USR.
Guanidines:	
Dicatechol borate, di-o-tolylguanidine salt	VNC.
*Thiazole derivatives:	
1,3-Bis(2-benzothiazolylmercaptomethyl) urea	RBC.
N-tert-Butyl-2-benzothiazolesulfenamide	BFG, MON, USR.
N-Cyclohexyl-2-benzothiazolesulfenamide	MON, USR.
2,5-Dimercapto-1,3,4-thiadiazole	VNC.
*2,2'-Dithiobisbenzothiazole	BFG, GYR, MON, USR.
2-Mercaptobenzothiazole	GYR, MON, USR.
2-Mercaptobenzothiazole, copper salt	ACY.
2-Mercaptobenzothiazole derivative	X.
2-Mercaptobenzothiazole, zinc salt	GYR, USR, VNC.
N-Morpholinyl-2-benzothiazolyl disulfide	GYR.
N-Oxydiethylene-2-benzothiazolesulfenamide	BFG, USR.
N-Oxydiethylenethiocarbonyl-N'-oxydiethylene-sulfenamide	BFG.
All other thiazole derivatives, cyclic	X.
*All other cyclic accelerators, activators, and vulcanizing agents:	
Bis(morpholinothiocarbonyl) disulfide	ACY.
Dibenzylamine	USR.
1,3-Dihydro-4(or 5)-methyl-2H-benzimidazole-2-thione	VNC.
Dimethylammonium hydrogen isophthalate	VNC.
Di-N,N'-pentamethylenethiuram tetrasulfide	DUP, VNC.
4,4'-Dithiodimorpholine	MON.
2-Mercaptotoluolimidazole, zinc salt	VNC.
m-Phenylenediamine	DUP.
Tetramethylthiuram tetrasulfide	GYR.
Thiocarbonyl	RBC.
All other accelerators, activators, and vulcanizing agents, cyclic	DUP, RBC, USR.
*Antioxidants, antiozonants, and stabilizers:	
*Amino antioxidants, antiozonants, and stabilizers:	
Aldehyde- and acetone-amine reaction products:	
Butyraldehyde-aniline condensate	DUP.
Diphenylamine-acetone aldehyde	USR.
Diphenylamine-acetone condensate	BFG, USR.
*Substituted p-phenylenediamines:	
Alkylaryl-p-phenylenediamines	MON.
N,N'-Bis(1,4-dimethylpentyl)-p-phenylenediamine	MON, UPM.
N,N'-Bis(1-ethyl-3-methylpentyl)-p-phenylenediamine	UPM.
N,N'-Bis(1-methylheptyl)-p-phenylenediamine	UPM.
N-Cyclohexyl-N'-phenyl-p-phenylenediamine	USR.
Diarylenediamines, mixed	GYR.
N-(1,3-Dimethylbutyl)-N'-phenyl-p-phenylenediamine	UPM, USR.
N,N'-Di-2-naphthyl-p-phenylenediamine	BFG.
N,N'-Diphenyl-p-phenylenediamine	BFG.
N-Isopropyl-N'-phenyl-p-phenylenediamine	USR.
N-(1-Methylheptyl)-N'-phenyl-p-phenylenediamine	UPM.
N-(1-Methylpentyl)-N'-phenyl-p-phenylenediamine	USR.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 28—Continued

Rubber-processing chemicals for which U.S. production and/or sales were reported, identified by manufacturer, 1986

<i>Rubber-processing chemicals</i>	<i>Manufacturers' identification codes (according to list in table 29)</i>
Cyclic—Continued	
*Antioxidants, antiozonants, and stabilizers—Continued	
*Amino antioxidants, antiozonants, and stabilizers—Continued	
*Substituted p-phenylenediamines—Continued	
All other p-phenylenediamines, substituted	KPI.
Other amines:	
p-Anilinophenol	BFG.
1,2-Dihydro-6-ethoxy-2,2,4-Trimethylquinoline (Ethoxyquin)	MON.
1,2-Dihydro-2,2,4-trimethylquinoline	BFG, MON, USR.
Nonyldiphenylamine mixture (Mono-, di-, and tri)	USR.
Octyldiphenylamine	BFG, USR.
Octyldiphenylamine, alkylated	BFG.
p-(p-Toluenesulfonamido)diphenylamine	USR.
*Phenolic and phosphite antioxidants and stabilizers:	
*Phosphites:	
Alkylaryl phosphites mixed	FER, MCB.
Nonylphenyl phosphites, mixed	MCB, OMC, USR.
Polymeric phosphites	MCB, OMC.
Polyphenolic phosphites, polyalkylated	BFG, MCB.
Triaryl phosphites	MCB.
*Polyphenolics (Including bisphenols)	
Bisphenol, hindered	DUP, FER, GYR, USR.
4,4'-Butyldenebis(6-tert-butyl-m-cresol)	MON.
2,5-Di-sec-butyldecylhydroquinone	USR.
2,5-Di-(1,1-dimethylpropyl)hydroquinone	MON.
2,2'-Methylenebis(6-tert-butyl-p-cresol)	ACY, FER.
2,2'-Methylenebis(6-tert-butyl-4-ethylphenol)	ACY.
1,1,3-Tri(2-methyl-4-hydroxy-5-tert-butylphenyl) butane	ICI.
All other phenolic antioxidants and stabilizers:	
Phenol, alkylated	ACY, BFG, GYR, NEV, RCI.
*Phenol, hindered	FER, OMC, USR.
Phenol, styrenated, mixtures	GYR, NEV, USR.
N-Stearoyl-p-aminophenol	HXL.
Blowing agents	
Dinitrosopentamethylenetetramine	OMC.
p,p'-Oxybis(benzenesulfonylhydrazide)	OMC, USR.
5-Phenyltetrazole	OMC.
p-Toluenesulfonylhydrazide	USR.
p-Toluenesulfonylsemicarbazide	USR.
Peptizers:	
2',2''-Dithiobis(benzanilide)	ACY.
All other cyclic rubber-processing chemicals	
p-tert-Amylphenol sulfide (Tackifier)	PAS.
4-Chloro-2,6-bis(2,4-dihydroxybenzyl)phenol	ICI.
N-(Cyclohexylthio)phthalimide	MON.
Diphenyl-4,4'-diphenylmethylenedicarbamate	USR.
All other rubber-processing chemicals, cyclic	ACY, FER, WTC.
Acyclic	
*Accelerators, activators, and vulcanizing agents:	
Dithiocarbamic acid derivatives:	
Dialkyldithiocarbamic acid derivative	VNC, X.
Dibutyldithiocarbamic acid, nickel salt	DUP, USR, VNC.
Dibutyldithiocarbamic acid, sodium salt	DUP, USR, VNC.
Dibutyldithiocarbamic acid, zinc salt	VNC.
Diethyldithiocarbamic acid, cadmium salt and bis(diethyldithiocarbamoyl) disulfide, mixture	VNC.
Diethyldithiocarbamic acid, selenium salt	VNC.
Diethyldithiocarbamic acid, sodium salt	EK, VNC.
Diethyldithiocarbamic acid, tellurium salt	VNC.
Diethyldithiocarbamic acid, zinc salt	GYR, VNC.
Dimethyldithiocarbamic acid, bismuth salt	VNC.

SECTION 9. RUBBER-PROCESSING CHEMICALS

Table 28—Continued

Rubber-processing chemicals for which U.S. production and/or sales were reported, identified by manufacturer, 1986

<i>Rubber-processing chemicals</i>	<i>Manufacturers' identification codes (according to list in table 29)</i>
Acyclic—Continued	
*Accelerators, activators, and vulcanizing agents—Continued	
Dithiocarbamic acid derivatives—Continued	
Dimethyldithiocarbamic acid, copper salt	VNC.
Dimethyldithiocarbamic acid, lead salt	VNC.
Dimethyldithiocarbamic acid, selenium salt	VNC.
Dimethyldithiocarbamic acid, sodium salt and sodium polysulfide	BFG.
Dimethyldithiocarbamic acid, zinc salt	GYR, VNC.
All other dithiocarbamic acid derivatives, acyclic	DUP, X.
Thiurams:	
Bis(dibutylthiocarbamoyl) disulfide	VNC.
Bis(diethylthiocarbamoyl) disulfide	GYR.
Bis(dimethylthiocarbamoyl) disulfide	GYR.
N,N'-Dioctadecyl-N,N'-diisopropyl thiuram disulfide	USR.
Xanthates and sulfides:	
Di-n-butylxantho disulfide	USR.
Zinc isopropyl xanthate	VNC.
All other acyclic accelerators, activators, and vulcanizing agents:	
p-Aminocyclohexylmethane carbonate	DUP.
n-Butyraldehyde-butylamine condensate	DUP.
Polymerization regulators:	
n-Decyl mercaptan	PLC.
n-Dodecyl mercaptans	PAS, PLC.
tert-Nonyl mercaptan	PAS, PLC.
n-Octyl mercaptan	PLC.
Tetradecyl mercaptan	PLC.
All other polymerization regulators, acyclic	PLC.
Shortstops	
Dimethyldithiocarbamic acid, potassium salt	USR.
Dimethyldithiocarbamic acid, sodium salt	ALC, BFG, USR, VCC.
All other acyclic rubber-processing chemicals:	
Waxes and paraffinic products	DUP, RCI.
Zinc laurate (Activator, physical property improver, and processing auxiliary)	USR.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 29

Rubber-processing chemicals alphabetical directory of manufacturers by code, 1986

(Names of manufacturers that reported production and/or sales of rubber-processing chemicals to the U.S. International Trade Commission for 1986 are listed below in the order of their identification codes as used in table 28)

<i>Code</i>	<i>Name of company</i>	<i>Code</i>	<i>Name of company</i>
ACY	American Cyanamid Co.	MCB	Borg-Warner Corp., Borg Warner Chemicals
ALC	Alco Chemical Corp.	MON	Monsanto Co.
BFG	B F. Goodrich Co., B. F. Goodrich Chemical Group	NEV	Neville Chemical Co.
DUP	E.I. duPont de Nemours & Co., Inc. Chemicals and Pigments Dept. Polymer Products Dept.	OMC	Olin Corp.
EK	Eastman Kodak Co.	PAS	Pennwalt Corp.
FER	Ferro Corp., Ferro Chemical Div.	PLC	Phillips Petroleum Co.
GYR	Goodyear Tire & Rubber Co.	RBC	Artel Chemical Corp.
HXL	Hexcel Corp., Hexcel Chemical Products	RCI	Reichhold Chemicals, Inc.
ICI	ICI Americas, Inc., Chemicals Div.	UPM	UOP, Inc.,
KPI	Kenrich Petrochemicals, Inc.	USR	Uniroyal, Inc., Uniroyal Chemical Div.
		VCC	Vinings Chemical Co.
		VNC	Vanderbilt Chemical Corp.
		WTC	Witco Chemical Corp.

Note.—Complete names, telephone numbers, and addresses of the above reporting companies are listed in table 1 of the appendix.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

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SYNTHETIC ORGANIC CHEMICALS, 1986

SECTION 10. ELASTOMERS

Edward J. Taylor

202-523-3709

Elastomers (synthetic rubber) are high polymeric materials with properties similar to those of natural rubber. The term "elastomers" as used in this report means substances, whether in bale, crumb, powder, latex, or other crude form, which can be vulcanized or similarly processed into a material that can be stretched to at least twice their original length; and, after having been so stretched and the stress removed, will return with force to approximately their original length. U.S. production and sales of elastomers in 1986 are shown in table 30.

Table 31 lists the products reported in this section and indicates the manufacture(s) of each by code. These codes are identified by company names in table 32.

Total U.S. production ¹ of synthetic rubber in 1986 amounted to 4,081 million pounds, an increase of 6.6 percent from that produced in 1985. The production of synthetic rubber increased irregularly from 3,842 million pounds in 1982 to 4,081 million pounds in 1986, or by 6.2 percent (see figure 11). Total sales of elastomers in 1986 amounted 2,489 million pounds, an increase of 11.7 percent from that sold in 1985.

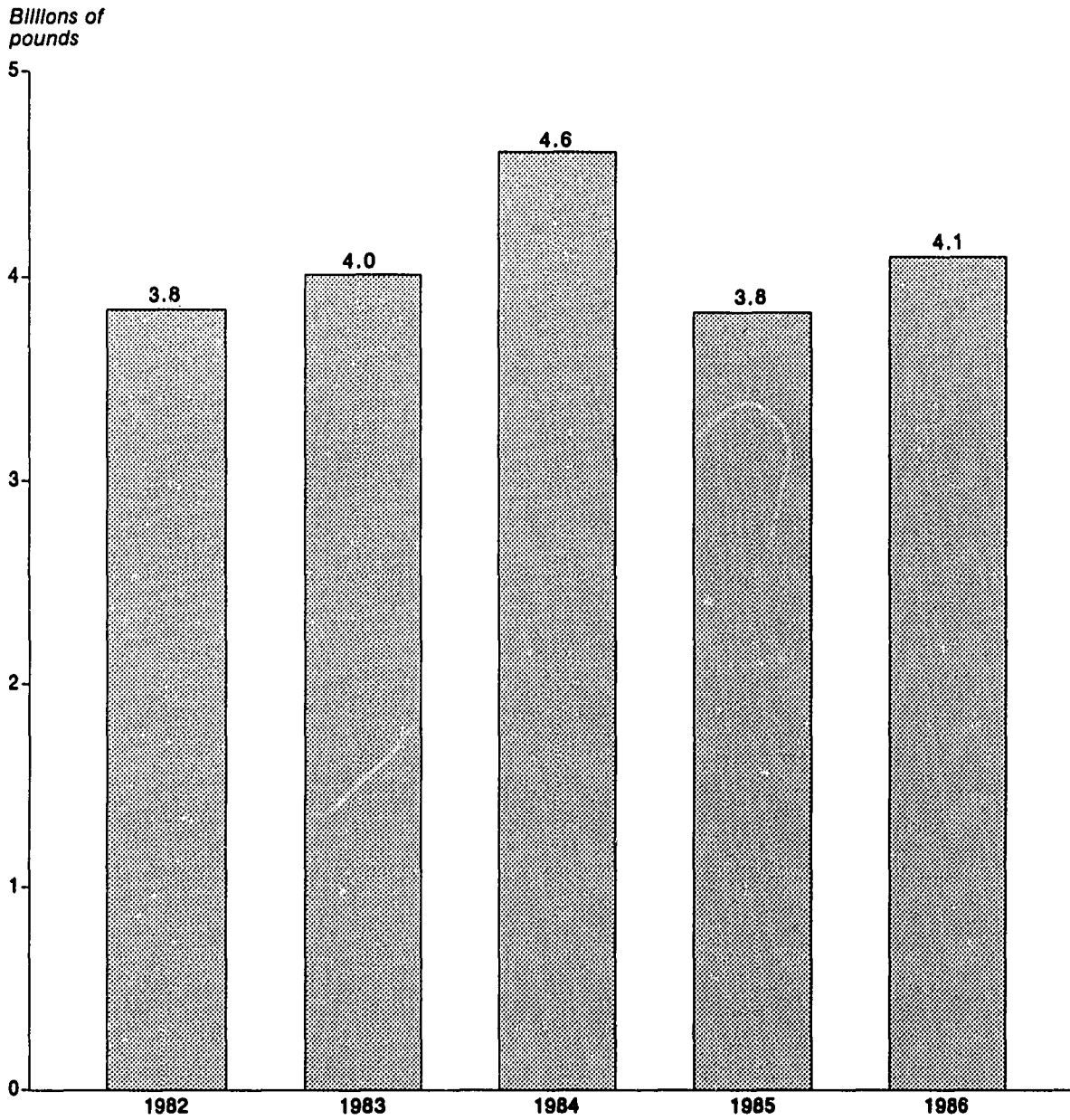
Styrene-butadiene rubber (SBR-type rubber) in 1986 continued to be the elastomer produced in the greatest quantity as it has been for more than a quarter of a century. U.S. production of SBR-type rubber, including 17 million pounds of its vinylpyridine sub-type, amounted to 1,611 million pounds in 1986. Solution polymerized polybutadiene rubber, a stereo type elastomer, was produced domestically in 1986 in the next largest amount—601 million pounds. Other principal types of synthetic elastomers for which U.S. production data are reported separately are ethylene-propylene rubber, production of which was 477 million pounds in 1986; and butadiene-acrylonitrile (NBR-type) rubber, production of which was 128 million pounds.

Sales of SBR-type rubber by U.S. producers in 1986 amounted to 715 million pounds. Sales of solution polymerized polybutadiene rubber amounted to 243 million pounds, and those of ethylene-propylene rubber to 406 million pounds. Sales of NBR-type rubber in 1986 amounted to 95 million pounds.

¹ Until now urethane-type elastomers have been included in the section 8 "Plastics and Resin Materials." The commission has now begun reporting statistics for urethane elastomers in two sections, section 8, plastics and resin materials, and section 10, elastomers (synthetic rubber). Henceforth those polyurethane products classified as "thermoplastic" urethane elastomers will be reported in SOC section 10; all other urethane elastomers will remain in SOC section 8.

SECTION 10. ELASTOMERS

Figure 11
Elastomers (synthetic rubber)



Source: U.S. International Trade Commission, *Synthetic Organic Chemicals: United States Production and Sales*.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 30

Elastomers (synthetic rubber):¹ U.S. production and sales, 1986

(Listed below are elastomers (synthetic rubber) for which reported data on production or sales may be published. (Leaders (...) are used where the reported data are accepted in confidence and may not be published or where no data were reported.) Table 31 lists all elastomers for which data on production and/or sales were reported and identifies the manufacturers of each)

Elastomers	Production ² 1,000 pounds	Sales		
		Quantity ² 1,000 pounds	Value 1,000 dollars	Unit value ³ Per pound
Grand total	4,081,067 ¹	2,488,536	2,212,614	\$0.89
Butadiene-acrylonitrile type (NBR-type)	128,054	94,766	90,221	95
Ethylene-propylene type (EP-type)	476,544	405,749	294,541	.73
Polybutadiene (solution polymerized) type (BR-type) ...	601,198	242,562	119,156	.49
Styrene-butadiene type (SBR-type) ⁴	1,593,993	715,133	292,797	.47
Styrene-butadiene-vinylpyridine type	16,980	...	...	...
All other elastomers ⁵	1,264,298	1,030,326	1,415,899	1.38

¹ The term "elastomers" is defined as substances in bale, crumb, powder, latex, and other crude forms which can be vulcanized or similarly processed into materials that can be stretched at 68° F. to at least twice their original length and, after having been stretched and the stress removed, will return with force to approximately their original length.

² Includes oil content of oil-extended elastomers.

³ Calculated from unrounded figures.

⁴ More than three-fourths of SBR elastomer production is the dry type of product.

⁵ Includes butyl, chlorinated natural rubber, epichlorohydrin, fluoroelastomers, polyacrylic ester type, polybutadiene type (emulsion), polychloroprene (neoprene) type, polyisobutylene type, polyisoprenes (including cyclorubber), polysulfide, silicone type, styrene-butadiene-vinylpyridine type (sales only), thermoplastic elastomers (such as styrene-block copolymers, thermoplastic olefin elastomers, and copolyesters), and miscellaneous elastomers.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

SECTION 10. ELASTOMERS

Table 31

Elastomers for which U.S. production and/or sales were reported, identified by manufacturer, 1986
 (Chemicals for which separate statistics are given in table 30 are marked below with an asterisk (*);
 chemicals not so marked do not appear in table 30 because the reported data are accepted in confidence
 and may not be published. Manufacturers' identification codes shown below are taken from table 32)

<i>Elastomers</i>	<i>Manufacturers' identification codes (according to list in table 32)</i>
Cyclic elastomers	
Cyclic elastomers:	
Epichlorohydrin elastomers (CO, ECO) type	DUP, SHC.
*Styrene-butadiene (S OR SBR) type:	
Styrene-butadiene, dry type	BFG, CPY, FRS, GRD, GYR, SPO.
Styrene-butadiene, latex type	BFG, MMM, RCI.
*Styrene-butadiene-vinylpyridine	BFG, FRS, GNT, GYR.
Styrene-butadiene type elastomers, other	LC.
Thermoplastic elastomers (such as styrene-block copolymers, thermoplastic olefin elastomers, thermoplastic urethane elastomers, and co-polyesters)	FRS, MON, SHC, WAY.
Cyclic elastomers, all other	
All other cyclic elastomers	HPC, TNA.
Acyclic elastomers:	
*Butadiene-acrylonitrile (nitrile) (NBR) type	BFG, CPY, GYR, MMM, USR.
Butyl(isobutylene-isoprene) type	ENJ.
*Ethylene-propylene (EP) type	ADC, CPY, DUP, ENJ, USR.
Fluorinated elastomers (CFM, FKM, FFKM) type	DUP, MMM.
Polyacrylate ester type:	
Polyacrylic (ACM) ester type elastomers	ACY, BFG.
Polyalkylene oxide	PRC.
Polybutadiene acrylic acid acrylonitrile terpolymer (PBAN)	ASY.
Polybutadiene (BR) type:	
Polybutadiene, emulsion-polymerized	GYR, SPO.
*Polybutadiene, solution-polymerized	ASY, FRS, GYR, PLC.
Polychloroprene (Neoprene) (CR) type	DKA, DUP, LC.
Polyisobutylene, type elastomers	ENJ.
Polyisoprene (IR) type	GYR, LC.
Polysulfide (T) type elastomers	MRT.
Silicone (Q) type elastomers	DCC, LC, SPD, SWS.
Acyclic elastomers, all other:	
All other acyclic elastomers	DUP, HPC, MRT.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 32

Elastomers (synthetic rubber) alphabetical directory of manufacturers by code, 1986

(Names of manufacturers that reported production and/or sales of elastomers to the U.S. International Trade Commission for 1986 are listed below in the order of their identification codes as used in table 31)

<i>Code</i>	<i>Name of company</i>	<i>Code</i>	<i>Name of company</i>
ACY	American Cyanamid Co.	HPC	Hercules, Inc.
ADC	Anderson Development Co.	LC	Lord Corp., Chemical Products Group
ASY	American Synthetic Rubber Corp.	MMM	Minnesota Mining and Manufacturing Co.
BFG	B.F. Goodrich Co., B. F. Goodrich Chemical Group:	MON	Monsanto
BFG	Ameripol Co., Div. of Uniroyal Goodrich Tire Co.	MRT	Morton-Thiokol, Inc., Morton Chemical Co. Div.
CPY	Copolymer Rubber & Chemical Corp.	PLC	Phillips Petroleum Co.
DCC	Dow Corning Corp.	PRC	Products Research & Chemical Corp.
DKA	Denka Chemical Corp.	RCI	Reichold Chemicals, Inc.
DUP	E.I. duPont de Nemours & Co., Inc.: Polymer Products Dept.	SHC	Shell Oil Co., Shell Chemical Co. Div.
ENJ	Exxon Chemical Americas:	SPD	General Electric Co., Silicone Products Dept.
FRS	Firestone Tire & Rubber Co., Firestone Synthetic Rubber & Latex Co. Div.	SPO	Synpol, Inc.
GNT	Diversitech General (Gencorp Co.)	SWS	Stauffer Chemical Co., Stauffer-Wacker Silicones Div.
GRD	W.R. Grace & Co., Polymers & Chemical Div.	TNA	Ethyl Corp.
GYR	Goodyear Tire & Rubber Co.	USR	Uniroyal, Inc., Chemical Group
		WAY	Olin Hunt Speciality Products, Inc.

Note.—Complete names, telephone numbers, and addresses of the above reporting companies are listed in app. A.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

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SYNTHETIC ORGANIC CHEMICALS, 1986

SECTION 11. PLASTICIZERS

Jesse Lawrence Johnson

202-523-0127

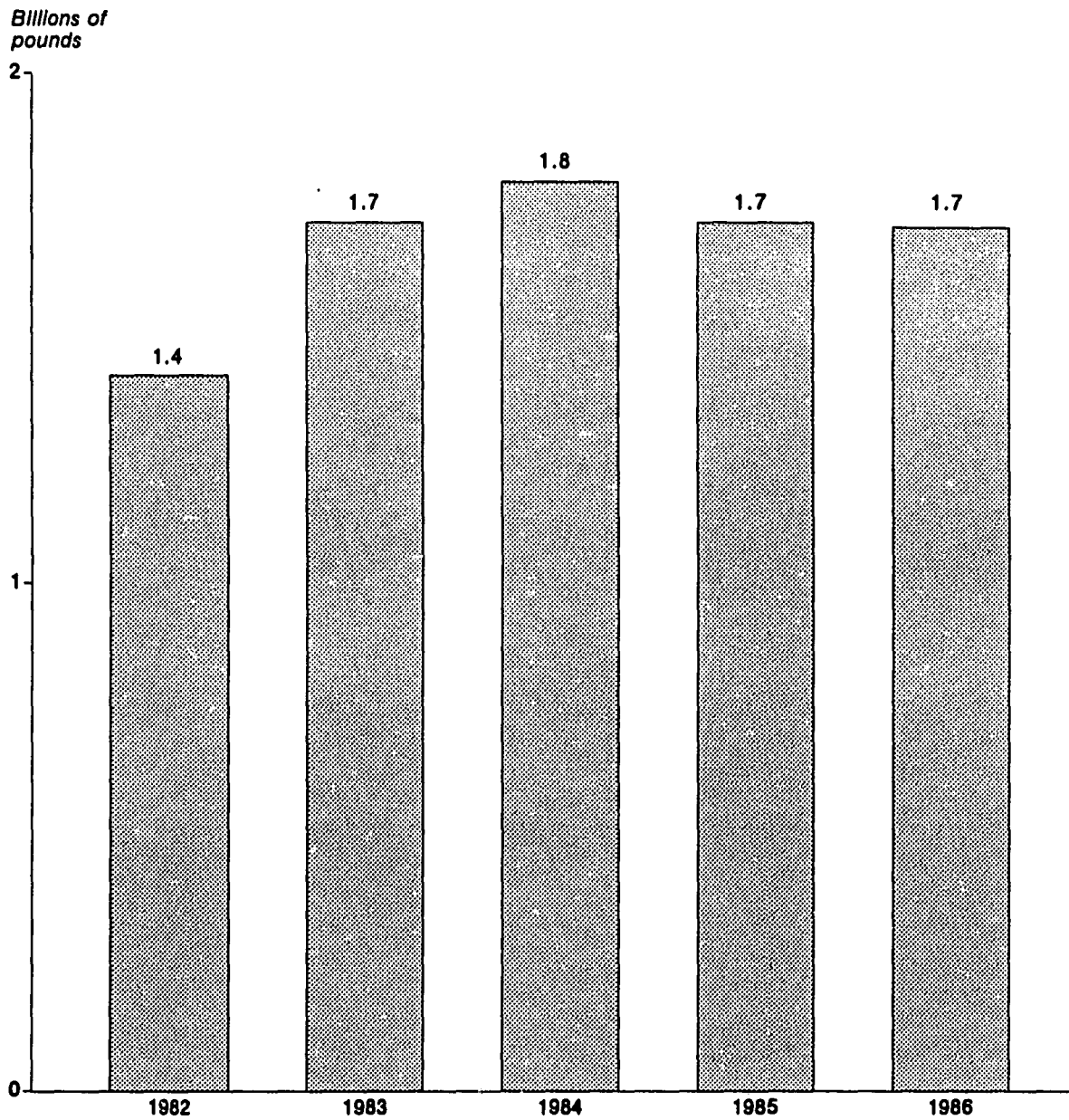
Plasticizers are organic chemicals that are added to synthetic plastics and resin materials to (1) improve workability during fabrication, (2) extend or modify the natural properties of these materials, or (3) develop new improved properties not present in the original material.

Table 33 presents statistics on U.S. production and sales of plasticizers in as great a detail as is possible without revealing the operations of individual producers. U.S. production of plasticizers totaled 1,722 million pounds in 1986, an increase of 0.7 percent from the 1,709 million pounds reported for 1985. The trend of production of these products is shown in the graph in figure 12. Sales of plasticizers totaled 1,624 million pounds, valued at \$765 million, in 1986, compared with 1,470 million pounds, valued at \$741 million, in 1985. Production of cyclic plasticizers in 1986, which consisted chiefly of the esters of phthalic anhydride, phosphoric acid, and trimellitic acid, amounted to 1,312 million pounds, an increase of 2.0 percent from the 1,286 million pounds reported for 1985. Sales of cyclic plasticizers in 1986 totaled 1,245 million pounds, valued at \$517 million, compared with 1,118 million pounds, valued at \$499 million, in 1985. The most important cyclic plasticizers were the dioctylphthalates, with production of 296 million pounds, in 1986. Production of acyclic plasticizers in 1986 totaled 410 million pounds, a decrease of 3.3 percent from the 424 million pounds reported for 1985. Sales of acyclic plasticizers totaled 379 million pounds, valued at \$248 million, in 1986, compared with 351 million pounds, valued at \$243 million, in 1985. Epoxidized esters were the most important acyclic plasticizers in 1986 with production of 90 million pounds.

Table 34 lists the products reported in this section and indicates the manufacturer(s) of each by code. These codes are identified by company name in table 35.

SECTION 11. PLASTICIZERS

Figure 12
Plasticizers



Source: U.S. International Trade Commission, *Synthetic Organic Chemicals: United States Production and Sales*.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 33
Plasticizers: U.S. Production and sales, 1986

Plasticizers	Production ¹	Sales		Unit value ²
		Quantity	Value	
	1,000 pounds	1,000 pounds	1,000 dollars	Per pound
Grand total	1,722,126	1,624,170	764,787	\$0.47
Benzenoid³	1,513,287	1,398,259	617,293	.44
Nonbenzenoid	208,839	225,911	147,494	.65
Cyclic				
Total	1,312,105	1,245,349	516,501	.41
Phosphoric acid esters⁴	69,559	57,547	54,771	.95
Phthalic anhydride esters, total	1,135,558	1,075,356	387,651	.36
Dibutyl phthalate ¹ (including diisobutyl phthalates) .	23,888	20,594	8,882	.43
Diethyl phthalate	19,590	13,853	21,533	1.55
Dilsodecyl phthalate ⁵	151,503	134,731	45,444	.34
Dimethyl phthalate	8,867	8,582	4,252	.50
Dioctyl phthalates ⁶	295,716	299,759	93,559	.31
Di-tridecyl phthalate	25,004	23,399	13,109	.56
All other phthalic anhydride esters	610,990	574,438	200,872	.35
Trimellitic acid esters	53,790	59,187	41,019	.69
All other cyclic plasticizers⁶	53,198	53,259	33,060	.62
Acyclic				
Total	410,021	378,821	248,286	.66
Adipic acid esters, total	132,942	94,585	62,598	.66
Di(2-ethylhexyl) adipate	46,694	42,925	21,312	.50
Diisobutyl adipate	897	849	981	1.15
Dilsodecyl adipate	2,853	2,525	1,682	.67
Dilsocetyl adipate	1,198	1,265	736	.58
Ditridecyl adipate	6,741	6,629	5,567	.84
All other adipic acid esters	74,559	40,392	32,320	.80
Complex linear polyesters and polymeric plasticizers	71,816	50,742	40,115	.79
Epoxydized esters	89,917	90,476	44,670	.49
Oleic acid esters, total	12,347	10,786	5,995	.56
Butyl oleate	846	...	...	...
Decyl oleate	376	326	410	1.26
All other oleic acid esters	11,125	10,460	5,585	.53
Palmitic acid esters	4,998	5,225	3,921	.75
Phosphoric acid esters	23,928	14,397	15,823	1.10
Di(2-ethylhexyl) sebacate	3,381	3,223	4,888	1.52
Stearic acid esters, total	12,077	11,854	8,181	\$0.70
n-Butyl stearate	8,591	8,418	4,860	.58
All other stearic acid esters	3,486	3,436	3,321	.97

See footnotes at end of table

SECTION 11. PLASTICIZERS

Table 33—Continued
Plasticizers: U.S. Production and sales, 1986

<i>Plasticizers</i>	<i>Production¹</i>	<i>Sales</i>		<i>Unit value¹</i>
		<i>Quantity</i>	<i>Value</i>	
	<i>1,000 pounds</i>	<i>1,000 pounds</i>	<i>1,000 dollars</i>	<i>Per pound</i>
<i>Acyclic—Continued</i>				
All other acyclic plasticizers ⁷	58,615	97,533	62,095	\$0.58

¹ Includes data for compounds used principally (but not exclusively) as primary plasticizers. Does not include clearly defined extenders or secondary plasticizers.

² Calculated from unrounded figures.

³ Includes benzenoid products as defined in part 1, schedule 4, of the Tariff Schedules of the United States Annotated.

⁴ Includes data for cresyl diphenyl phosphate, dibutyl phenyl phosphate, diphenyl octyl phosphate, tricresyl phosphate, triphenyl phosphate, and other cyclic phosphoric acid esters.

⁵ The difference between the production reported here and that shown on the *Preliminary Report on U.S. Production of Selected Organic Chemicals (Including Synthetic Plastics and Resin Materials), 1986*, results from a combination of incorrect reporting by some companies, end-of-year inventory adjustments, and rounding.

⁶ Includes data for glycol dibenzoates, toluenesulfonamides, tetrahydrofurfuryl oleate, and other cyclic plasticizers.

⁷ Includes data for azelalac acid esters, citric and acetylcitric acid esters, myristic acid esters, pelargonic acid esters, ricinoleic and acetylricinoleic acid esters, glyceryl and glycol esters, and other acyclic plasticizers.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 34

Plasticizers for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1986

(Chemicals for which separate statistics are given in table 33 are marked below with an asterisk (*); chemicals not so marked do not appear in table 33 because the reported data are accepted in confidence and may not be published. Manufacturers' identification codes shown below are taken from table 35. An "X" signifies that the manufacturer did not consent to his identification with the designated product)

Plasticizers	Manufacturers' identification codes (according to list in table 35)
*Cyclic	
N-n-Butyl benzenesulfonamide	TNA.
Diethylene glycol dibenzoate	KLM, VEL.
Dipropandiol dibenzoate (Dipropylene glycol dibenzoate)	KLM, VEL.
N-Ethyl-p-toluenesulfonamide	MON, NES.
Glyceryl tribenzoate	VTC.
*Phosphoric acid esters:	
Cresyl diphenyl phosphate	CHL.
Isodecyl diphenyl phosphate	SFS.
Tricresyl phosphate	FMC, SFS.
Triphenyl phosphate	EK, MON, SFS.
All other phosphoric acid esters	FMC, MON, SFS, SM.
*Phthalic anhydride esters:	
Alkyl benzyl phthalates	MON.
Bis(2-ethylhexyl)terephthalate	EKT.
Butyl benzyl phthalate	MON.
Butyl 2-ethylhexyl phthalate	BAS.
Butyl octyl phthalates	RCI, USS.
Cyclohexyl isooctyl phthalates	UTC.
Di(2-butoxyethyl) phthalate	HAL.
*Dibutyl phthalate (including Diisobutyl phthalate)	BAS, EKT, HCC, NOD, USS, WTH.
Dicyclohexyl phthalate	UTC, X.
Diethylene glycol phthalate	CMB.
Diethyl isophthalate	X.
*Diethyl phthalate	BAS, EKT, KF, MON, MRF.
Di-(n-heptyl-n-nonyl) undecyl phthalate	ENJ.
*Disodecyl phthalate	BAS, ENJ, HCC, NOD, RCI, TEK, USS.
Diisohexyl phthalate	ENJ.
Diisononyl phthalate	BAS, ENJ, TEK, USS.
Di(2-methoxyethyl) phthalate	EKT.
Dimethyl isophthalate	UTC, X.
*Dimethyl phthalate	EKT, KF, MRF, WTC, UTC, X.
Dinonyl phthalate	ENJ.
Dinonyl undecyl phthalate	NOB.
*Ditridecyl phthalate	ENJ, HCC, NOD, SM, TEK, USS.
Ditridecyl phthalate	MON, TEK, USS.
2-Ethylhexyl cyclohexyl phthalate	HCC.
Hexyl n-decyl phthalate	VST.
n-Octyl n-decyl phthalate	RCI, USS.
Phthalic acid, diallyl ester	TNA.
*Dioctyl phthalates:	
Di(2-ethylhexyl) phthalate	BAS, EKT, ENJ, HCC, RCI, TEK, USS, VST.
Disooctyl phthalate	ENJ, HCC, NOD, RCI, TEK.
Di-n-octyl phthalate	EK.
All other dioctyl phthalates	BAS, WTH.
Glycol phthalate esters:	
Butyl phthalyl butyl glycolate	X.
All other glycol phthalate esters	HAL.
*All other phthalic anhydride esters	
Polyethylene glycol dibenzoate	BAS, MON, NOD, TEK, WTC.
Tetrahydrofurfuryl oleate	VEL.
Toluenesulfonamide o-, p-mixtures	EMR, WTC.
*Trimellitic acid esters:	
Tri(2-ethylhexyl) trimellitate	MON, UTC.
Tri-n-hexyl trimellitate	BAS, HCC, TEK.
Trisodecyl trimellitate	MRF.
Trileononyl trimellitate	ENJ, HCC.
Trisooctyl trimellitate	TEK, USS.
Trimethyl trimellitate	ENJ, NOD, RCI, TEK.
Tri-n-octyl n-decyl trimellitate	FER, X.
	RCI, TEK.

SECTION 11. PLASTICIZERS

Table 34—Continued

Plasticizers for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1986

<i>Plasticizers</i>	<i>Manufacturers' identification codes (according to list in table 35)</i>
*Cyclic—Continued	
*Trimellitic acid esters—Continued	
Trioctyl trimellitate	EKT, RCI, USS, X.
All other trimellitic acid esters	HCC, TEK, USS, X, X.
*All other cyclic plasticizers	BAS, NEV, NOD, SBC, X.
*Acyclic	
*Adipic acid esters:	
Butylene glycol adipate	HAL.
Di(2-(2-butoxyethoxy)ethyl) adipate	HAL, MON, RCI.
Dibutoxyethyl adipate	EKT, HAL.
*Di(2-ethylhexyl) adipate	BAS, EKT, ENJ, HAL, HCC, MON, MRF, NOD, RCI, TEK, USS, WTH.
Di-n-hexyl adipate	EKT, MON.
*Diisobutyl adipate	EKT, HAL, HCC, WTC.
*Disodecyl adipate	EMR, HAL, HCC, MRF, NOD, RCI, SM.
Dilisononyl adipate	ENJ, TEK, USS.
*Diisooctyl adipate	ENJ, HCC, RCI, TEK.
Diisopropyl adipate	VND, WTH.
Dimethyl adipate	MRF, X.
Di-n-octyl adipate	WTH.
Di-n-propyl adipate	HCC.
*Di-tridecyl adipate	EMR, HCC, NOD, SM, WM.
Ethylene glycol adipate	HAL.
n-Hexyl n-decyl adipate	EMR.
Neopentyl glycol adipate	HAL.
n-Octyl n-decyl adipate	HCC, RCI, TEK, USS.
Propylene glycol adipate	HAL.
*All others adipic acid esters	HAL, HCC, WTC.
Azelic acid esters:	
Bis(hydroxypropyl) azelate	EMR.
Di(2-ethylhexyl) azelate	EKT, EMR, HAL, HCC, RCI.
Diisooctyl azelate	EMR.
All other azelaic acid esters	WTC.
Citric and acetylcitric acid esters:	
Tributyl acetylcitrate	UTC, X.
Tributyl citrate	X.
Triethyl acetylcitrate	X.
Triethyl citrate	X.
All other citric and acetylcitric acid esters	X.
*Complex linear polyesters and polymeric plasticizers:	
Adipic acid type complex linear polyesters and polymeric plasticizers	HAL, MRF, TEK, WTC, WTH.
All other complex linear polyesters and polymeric plasticizers	EKX, EMR, VND, WTC.
*Epoxidized esters:	
Epoxidized linseed oils	UCC, VIK.
Epoxidized pentaerythritol tetraphthalate	UCC.
Epoxidized soya oils	FER, FMC, TEK, UCC, VIK.
2-Ethylhexyl epoxyallates	UCC.
All other epoxidized esters	VIK.
Glyceryl tripropionate	EKT.
Glutaric acid esters:	
Butylene glycol glutarate	HAL.
Neopentyl glycol glutarate	HAL.
All other glutaric acid esters	HAL.
Myristic acid esters:	
Isopropyl myristate	WM, WTH.
Myristyl ethoxy myristate	SCP.
Octanoic acid esters:	
Palmityl octanoate	SBC.
All other octanoic acid esters	X.
*Oleic acid esters:	
2-Butoxyethyl oleate	HAL.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 34—Continued

Plasticizers for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1986

Plasticizers	Manufacturers' identification codes (according to list in table 35)
*Acyclic—Continued	
*Oleic acid esters—Continued	
*Butyl oleate	EMR, WTC, WTH.
*Decyl oleate	SBC, SCP, VND.
2-Ethylhexyl oleate	HAL.
Glyceryl trioleate (Triolein)	EMR, WTC.
Isocetyl oleate	HAL.
Methyl oleate	DA(E), EMR, TCH, WTC.
Neopentyl glycol dioleate	HCC.
Oleyl oleate	SBC.
Propyl oleates:	
n-Propyl oleate	EMR, TCH.
Trimethylolpropane trioleate	HCC.
All other oleic acid esters	DA(E), EMR, HAL.
*Palmitic acid esters:	
n-Butyl palmitate	EKT.
2-Ethylhexyl palmitate	VND, WM, WTH.
Isobutyl palmitate	WTH.
Isopropyl palmitate	WM, WTH.
2-Methoxyethyl palmitate	EKT.
All other palmitate acid esters	TCH.
Pelargonic acid esters:	
2-Ethylhexyl pelargonate	SBC.
Glycol pelargonate	EMR, TCH.
Isodecyl pelargonate	EMR.
All other pelargonic acid esters	HCC, WM.
*Phosphoric acid esters:	
Tri(2-butoxyethyl) phosphate	FMC, MON, SFS.
Tributyl phosphate	SFS.
Tri(2-chloroethyl) phosphate	SFS.
Tri(2-chloropropyl) phosphate	FER, SFS.
Triethyl phosphate	EKT.
Triocetyl phosphate	SFS.
All other phosphoric acid esters	SFS.
Ricinoleic and acetylricinoleic acid esters:	
n-Butyl acetylricinoleate	CAS(E).
Butyl ricinoleate	CAS(E).
Ethyl glycol monoricinoleate	CAS(E).
Glyceryl monoricinoleate	CAS(E).
Glyceryl tri(acetylricinoleate)	CAS(E).
Methyl acetylricinoleate	CAS(E).
Methyl ricinoleate	CAS(E), DA(E).
Propylene glycol monoricinoleate	CAS(E).
Sebacic acid esters:	
Dibutyl sebacate	X.
*Di(2-ethylhexyl) sebacate	HAL, HCC, X.
Dilsoopropyl sebacate	SBC, X.
Dimethyl sebacate	X.
Propylene glycol sebacate	HAL.
*Stearic acid esters:	
*n-Butyl stearate	CHL, EMR, TCH, WM, WTC, WTH.
Diethylene glycol succinate	CMB.
2-Ethylhexyl stearate	STC, WM.
Hexadecyl stearate	STC.
Isobutyl stearate	DA(E), TCH, WTH.
Isodecyl stearate	WM.
Myristyl stearate	VND.
2-Octyldecyl-12-stearoyl stearate	VND.
Tridecyl stearate	HCC, WM.
*All other stearic acid esters	SBC, SCP, WTC.
Sucrose acetate isobutyrate	EKT.
Tetraethylene glycol di(2-ethylhexanoate)	HAL, UCC, WM.
Triethylene glycol di(caprylate-caprate)	HAL.
Triethylene glycol di(2-ethylbutyrate)	HAL, UCC.

SECTION 11. PLASTICIZERS

Table 34—Continued

Plasticizers for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

<i>Plasticizers</i>	<i>Manufacturers' identification codes (according to list in table 35)</i>
*Acyclic—Continued	
Triethylene glycol di(2-ethylhexanoate)	EKT.
2,2,4-Trimethyl-1,3-pentanediol diisobutyrate	EKX.
*All other acyclic plasticizers	ARZ, EMR, HCC, HPC, TCH, WM.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 35

Plasticizers alphabetical directory of manufacturers by code, 1986

(Names of manufacturers that reported production and/or sales of dyes to the U.S. International Trade Commission for 1986 are listed below in the order of their identification codes as used in table 34)

<i>Code</i>	<i>Name of company</i>	<i>Code</i>	<i>Name of company</i>
ARZ	Arizona Chemical Co.	NES	Ruetgers-Nease Chemical Co.
BAS	BASF Corp.	NEV	Neville Chemical Co.
CAS	CasChem, Inc.	NOD	Nuodex, Inc.
CHL	Chemol Co.	RCI	Reichhold Chemicals, Inc.
CMB	Cambridge Industries Co.	SBC	Scher Chemicals, Inc.
DA	Diamond Shamrock Corp., Chemicals Div.	SCP	Henkel Corp.
EK	Eastman Kodak Co.:	SFS	Stauffer Chemical Co.
EKT	Tennessee Eastman Co. Div.	SM	Speciality Chemicals Group
EKX	Texas Eastman Co. Div.		Mobil Oil Corp., Mobil Chemical Co., Chemical
EMR	Emery Chemicals Div. of National Distillers & Chemical Corp.	STC	Products Div.
ENJ	Exxon Chemical Americas		American Hoechst Corp., Sou-Tex Works
FER	Ferro Corp.:	TCH	Emery Industries, Inc., Trylon Div.
	Ferro Chemical Div.	TEK	Teknor Apex Co.
	Grant Chemical Div.	TNA	Ethyl Corp.
FMC	FMC Corp.	UCC	Union Carbide Corp.
HAL	C.P. Hall Co.	UTC	Unitex Chemical Corp.
HCC	Hatco Chemical Corp.	USS	U.S. Steel Corp., USS Chemicals Div.
HPC	Hercules, Inc.	VDM	Van De Mark Chemical Co., Inc.
KF	Dynamit Nobel Chemicals, Inc.	VEL	Velcol Chemical Corp.
KLM	Kalama Chemical, Inc.	VIK	Viking Chemical Co.
MON	Monsanto Co.	VND	Van Dyk Div. of Mallinckrodt, Inc.
MRF	Morflex Chemical Co., Inc.	VST	Vista Chemical Co.
		WM	Inolex Chemical Co.
		WTC	Witco Chemical Corp.
		WTH	Union Camp Corp.

Note.—Complete names, telephone numbers, and addresses of the above reporting companies are listed in app. A.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

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SYNTHETIC ORGANIC CHEMICALS, 1986

SECTION 12. SURFACE-ACTIVE AGENTS

Eric Land

202-523-0491

The surface-active agents included in this report are organic chemicals that reduce the surface tension of water or other solvents and are used chiefly as detergents, dispersing agents, emulsifiers, foaming agents, or wetting agents in either aqueous or nonaqueous systems. Waxes and products used chiefly as plasticizers are excluded. Surface-active agents are produced from natural fats and oils, from silvichemicals such as lignin, rosin, and tall oil, and from chemical intermediates derived from coal tar and petroleum. A major part of the output of the bulk chemicals shown in this report is consumed in the form of packaged soaps and detergents for household and industrial use. The remainder is used in the processing of textiles and leather, in ore flotation and oil-drilling operations, and in the manufacture of agricultural sprays, cosmetics, elastomers, foods, lubricants, paint, pharmaceuticals, and many other products.

The statistics for production and sales of surface-active agents (table 36) are grouped by ionic class and by chemical class and subclass. All quantities are reported in terms of 100-percent organic surface-active ingredients and thus exclude all inorganic salts, water, and other diluents. Sales statistics reflect sales of bulk surface-active agents only; sales of formulated products are excluded. Data for "all other" in each of the categories, which was published in previous editions, can be derived by subtracting from the totals of each category the sum of the enumerated items within that category. Data for the production of surface-active agents during 1982-86 are shown in figure 13.

Total U.S. production of surface-active agents in 1986 amounted to 5,895 million pounds, or 9.9 percent more than the 5,363 million pounds reported for 1985. Sales of bulk surface-active agents in 1986 amounted to 3,567 million pounds, valued at \$1,606 million, compared with sales in 1985 of 3,328 million pounds, valued at \$1,574 million. In terms of quantity, sales in 1986 were 7.2 percent more than in 1985.

Production of anionic surface-active agents in 1986 amounted to 3,659 million pounds, or 62.1 percent of the total surfactant output reported for 1986. Sales of anionics in 1986 amounted to 1,711 million pounds, valued at \$510 million.

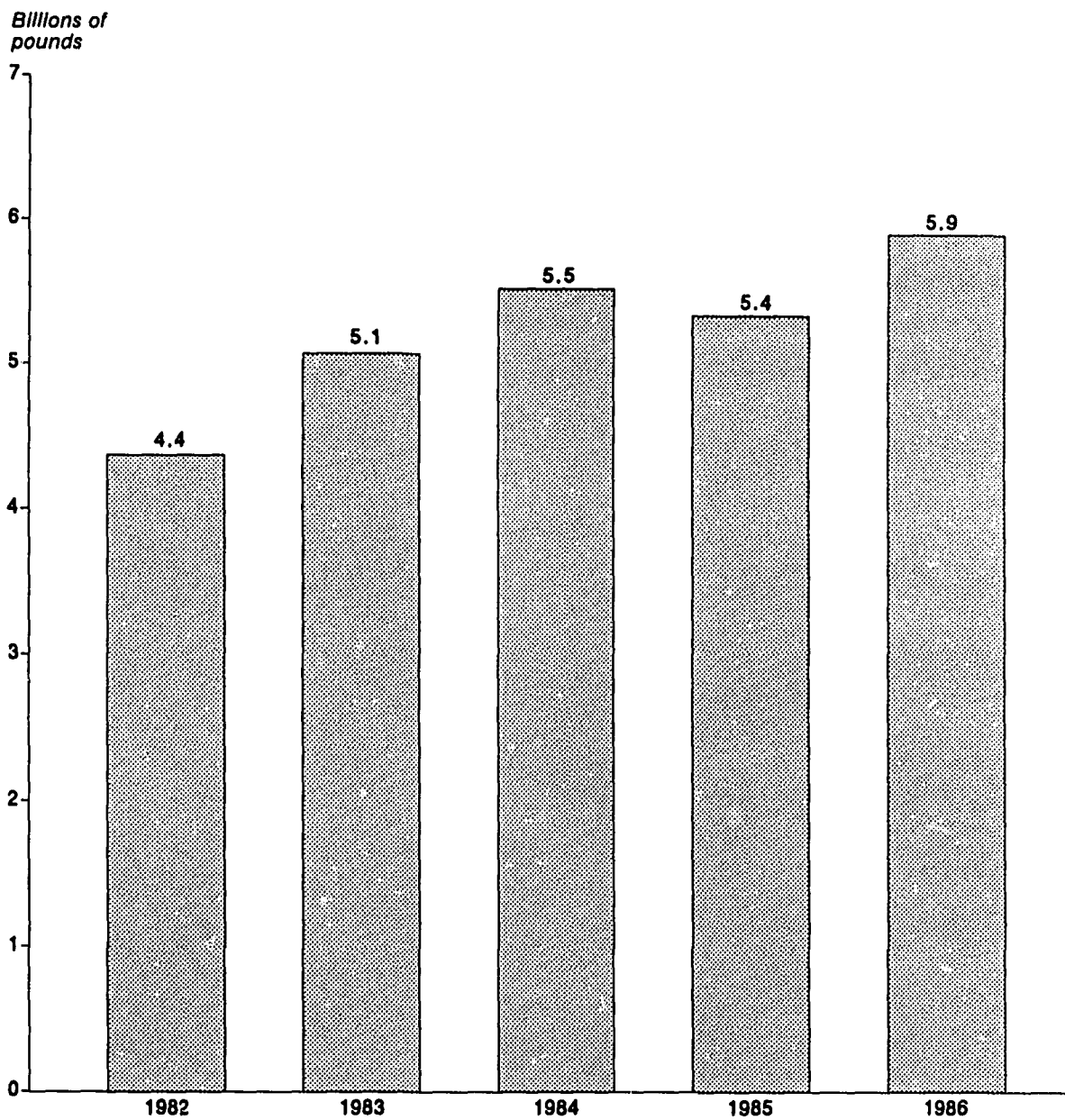
Production of cationic surface-active agents in 1986 amounted to 492 million pounds, 17.7 percent more than the 418 million pounds reported in 1985. Production of nonionic surface-active agents amounted to 1,717 million pounds in 1986, 9.8 percent more than the 1,564 million pounds reported in 1985. Sales of cationic surface-active agents in 1986 increased by 3.3 percent in terms of quantity, and by 5.2 percent in terms of value when compared with sales as reported in 1985. Sales of nonionics in 1986 increased by 15.2 percent in terms of quantity, and by 6.0 percent in terms of value when compared with sales as reported in 1985.

The difference between production and sales reflects inventory changes and captive consumption of surface-active agents by synthetic rubber producers, and by manufacturers of cosmetics, packaged detergents, bar soaps, and other formulated consumer products. In some instances the difference may also reflect quantities of surface-active agents used as chemical intermediates, e.g., nonionic alcohol and alkylphenol ethoxylates which may be converted to anionic surface-active agents by phosphorylation or sulfation.

Table 37 lists the products reported in this section and indicates the manufacturer(s) of each by code. These codes are identified by company name in table 38.

SECTION 12. SURFACE-ACTIVE AGENTS

Figure 13
Surface-active agents



Source: U.S. International Trade Commission, *Synthetic Organic Chemicals: United States Production and Sales*.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 36
Surface-active agents: U.S. production and sales, 1986

(Listed below are the surface-active agents for which reported data on production or sales may be published. (Leaders (...)) are used where the reported data are accepted in confidence and may not be published or where no data were reported.) Table 37 lists all surface-active agents for which data on production and/or sales were reported and identifies the manufacturers of each)

Surface-active agents	Sales ²			
	Production ¹ 1,000 pounds	Quantity 1,000 pounds	Value 1,000 dollars	Unit value ³ Per pound
Grand total	5,895,381	3,567,009	1,606,160	\$0.45
Benzenoid ⁴	1,439,061	767,790	395,119	.51
Nonbenzenoid	4,456,320	2,799,219	1,211,041	.43
Amphoteric				
Total	27,307	24,498	26,200	1.07
(Carboxymethyl) [3-(coconut oil amido)propyl] dimethylammonium hydroxide, inner salt	3,863	3,500	2,386	.68
N-Dodecyl-3-iminodipropionic acid, disodium salt ...	186	189	254	1.34
N-(Tallow alkyl)-3-iminodipropionic acid, disodium salt	228	239	306	1.28
All other amphoteric surface active agents	23,030	20,570	23,254	1.13
Anionic				
Total	3,658,773	1,711,423	510,173	.30
Carboxylic acids (and salts thereof), total	759,865	183,112	72,803	.40
Amine salts of fatty, rosin, and tall oil acids, total	2,267	812	637	.78
Stearic acid, triethanolamine salt	376	91	76	.84
All other amine salts of fatty, rosin, and tall oil acids	1,891	721	561	.78
Coconut oil acids, potassium salt .....	...	361	209	.58
Coconut oil acids, sodium salt	131,039	4,384	1,265	.29
Tall oil acids, potassium salt	10,241	...	...	...
Tallow acids, sodium salt	368,814	26,525	5,916	.22
All other carboxylic acids (and salts thereof)	247,504	151,030	64,776	.43
Phosphoric and polyphosphoric acid esters (and salt thereof), total	42,718	33,225	30,974	.93
Alcohols and phenols, alkoxylated and phosphated, total	28,628	25,208	21,917	.87
Decyl alcohol, ethoxylated and phosphated	1,764	1,692	1,226	.72
Dinonylphenol, ethoxylated and phosphated	1,199	1,113	994	.89
Mixed linear alcohols, ethoxylated and phos- phated	5,584	5,477	5,285	.96
Nonylphenol, ethoxylated and phosphated	5,333	4,999	4,119	.82
Phenol, ethoxylated and phosphated	1,691	1,661	1,545	.93
Polyhydric alcohol, ethoxylated and phosphated ...	115	...	...	...
Tridecyl alcohol, ethoxylated and phosphated ...	2,329	...	...	...
All other alcohols and phenols, alkoxylated and phosphated	10,613	10,266	8,748	.85
Decyl and octyl phosphate	677	...	...	...
2-Ethylhexyl phosphate	182	165	218	1.32
2-Ethylhexyl phosphate, sodium salt .....	...	1,697	828	.51
Mixed alkyl phosphate	3,404	2,260	2,966	1.30
All other phosphoric and polyphosphoric acid esters (and salts thereof)	9,827	3,875	5,047	1.30
Sulfonic acids (and salts thereof), total	2,084,410	1,305,444	274,623	.21
Alkylbenzenesulfonates, total	753,332	151,988	85,493	.56
Dodecylbenzenesulfonic acid	295,013	84,240	38,782	.46

See footnotes at end of table.

SECTION 12. SURFACE-ACTIVE AGENTS

Table 36—Continued

Surface-active agents: U.S. production and sales, 1986

Surface-active agents	Sales ^a			
	Production ¹	Quantity	Value	Unit value ²
	1,000 pounds	1,000 pounds	1,000 dollars	Per pound
Anionic—Continued				
Sulfonic acids (and salts thereof)—Continued				
Alkylbenzenesulfonates—Continued				
Dodecylbenzenesulfonic acid, calcium salt	6,541	4,059	3,812	\$0.94
Dodecylbenzenesulfonic acid, isopropylamine salt	4,232	3,440	2,888	.84
Dodecylbenzenesulfonic acid, monoethanolamine salt	135	...	...	...
Dodecylbenzenesulfonic acid, sodium salt	302,019	51,630	34,502	.67
Dodecylbenzenesulfonic acid, triethanolamine salt	7,676	7,716	4,466	.58
Tridecylbenzenesulfonic acid, sodium salt	120,692	...	...	...
All other alkylbenzene sulfonates	17,024	903	1,043	1.16
Benzene-, cumene-, toluene-, and xylenesulfonates, total	124,698	108,589	26,001	.24
Xylenesulfonic acid, sodium salt	84,810	75,899	15,223	.20
All other benzene-, cumene-, toluene-, and xylenesulfonates	39,888	32,690	10,778	.33
Ligninsulfonates and naphthalenesulfonates, total .	935,444	906,106	78,903	.09
Diisopropylnaphthalenesulfonic acid, sodium salt	1,399	1,060	2,011	2.90
Ligninsulfonic acid, ammonium salt	11,199	11,125	862	.08
Ligninsulfonic acid, calcium salt	528,171	498,890	23,788	.05
Ligninsulfonic acid, sodium salt	313,716	313,901	14,306	.05
All other ligninsulfonates and naphthalene sulfonates	80,959	81,130	37,936	.33
Mixed alkane sulfonic acid, sodium salt	8,815	9,164	6,263	.68
Sulfosuccinamic acid derivatives	4,122	3,922	2,349	.60
Taurine derivatives	2,387	1,233	2,990	2.42
Sulfonic acids having ester or ether linkages, total	127,384	48,894	49,695	1.02
Sulfosuccinic acid esters, total	28,001	22,085	24,436	1.11
Sulfosuccinic acid, bis(2-ethylhexyl)ester sodium salt	20,726	15,824	17,950	1.13
Sulfosuccinic acid, diisooctyl ester, sodium salt	721	341	326	.96
Sulfosuccinic acid, ditridecyl ester, sodium salt	197	133	193	1.45
All other sulfosuccinic acid esters	6,357	5,787	5,967	1.03
All other sulfonic acids having ester or ether linkages	99,383	26,809	25,259	.94
All other sulfonic acids (and salts thereof) ^b	128,228	75,548	22,929	.30
Sulfuric acid esters (and salts thereof), total	771,780	189,642	131,773	.69
Acids, amides, and esters, sulfated, total	8,551	5,983	3,477	.58
Butyl oleate, sulfated, sodium salt	1,869	1,717	767	.46
All other acids, amides, and esters, sulfated	6,682	4,266	2,690	.63
Alcohols, sulfated, total	266,505	93,489	66,726	.71
Dodecyl sulfate, ammonium salt	44,601	31,074	13,061	.42
Dodecyl sulfate, sodium salt	33,716	32,502	25,612	.79
Dodecyl sulfate, triethanolamine salt	12,126	9,042	7,175	.79
2-Ethylhexyl sulfate sodium salt	1,738	1,837	2,154	1.17
Mixed linear alcohols, sulfated, ammonium salt	61,954	3,699	3,115	.84
Mixed linear alcohols, sulfated, sodium salt . . . . .	...	5,630	5,534	.98
Mixed linear alcohols, sulfated, triethanolamine salt	13,170	...	...	...
Octyl sulfate, sodium salt	130	135	197	1.46
All other alcohols, sulfated	99,070	9,570	9,878	1.03
Ethers, sulfated, total	469,420	65,943	44,022	0.67
Alkylphenols, ethoxylated and sulfated	5,136	5,389	5,477	1.02

See footnotes at end of table.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 36—Continued

Surface-active agents: U.S. production and sales, 1986

Surface-active agents	Sales ²			
	Production ¹ 1,000 pounds	Quantity 1,000 pounds	Value 1,000 dollars	Unit value ³ Per pound
Anionic—Continued				
Sulfuric acid esters (and salts thereof)—Continued				
Ethers, sulfated—Continued				
Dodecyl alcohol, ethoxylated and sulfated, sodium salt	9,537	9,372	9,677	\$1.03
Mixed linear alcohols, ethoxylated and sulfated ammonium salt .....	...	25,880	13,029	.50
Mixed linear alcohols, ethoxylated and sulfated, sodium salt .....	...	23,799	14,346	.60
All other ethers, sulfated	454,747	1,503	1,493	.99
Natural fats and oils, sulfated, total	27,304	24,227	17,548	.72
Castor oil, sulfated, sodium salt	3,966	3,196	2,486	.78
Tall oil, sulfated, sodium salt	811	735	317	.43
Tallow, sulfated, sodium salt	614	508	245	.48
All other natural fats and oils, sulfated	21,913	19,788	14,500	.73
Cationic				
Total	492,299	321,895	314,377	.98
Amine oxides and oxygen-containing amines (except those having amide linkages), total				
	104,856	38,173	35,725	.94
Acyclic, total				
	97,755	33,590	30,211	.90
(Coconut oil alkyl)amine, ethoxylated	2,676	6,239	5,635	.90
(Hydrogenated tallow alkyl)amine, ethoxylated ..	902	657	443	.67
(9-Octadecenyl)amine, ethoxylated	1,305	1,273	843	.66
Octadecylamine, ethoxylated	1,245	1,256	2,154	1.71
(Soybean oil alkyl)amine, ethoxylated	305	...	...	...
(Tallow alkyl)amine, ethoxylated	5,841	5,492	4,280	.76
All other acyclic	85,481	18,673	16,856	.90
Cyclic (including imidazoline and oxazoline derivatives), total				
	7,101	4,583	5,514	1.20
1-(2-Hydroxyethyl)-2-nor(tall oil alkyl)-2-imidazoline	93	...	...	...
All other cyclic (including imidazoline and oxazoline derivatives)	7,008	4,583	5,514	1.20
Amines and amine oxides having amide linkages, total				
	31,551	20,631	17,444	.85
3-Lauramido-N,N-dimethylpropyl amine oxide	149	...	...	...
Stearic acid-diethylenetriamine condensate	582	574	775	...
Tall oil acids polyalkylenepolyamine condensate ...	10,895	...	...	...
All other amines and amine oxides having amide linkages	19,925	20,057	16,669	.83
Amines, not containing oxygen (and salts thereof), total				
	149,605	76,884	66,165	.86
Amine salts				
	1,272	1,608	1,571	.98
Diamines and polyamines, total				
	26,086	18,892	15,609	.83
Imidazoline derivatives	1,791	2,682	3,343	1.52
N-(Coconut oil alkyl)trimethylenediamine .....	...	1,205	1,037	.86
N-(Tallow alkyl)dipropylenetriamine .....	...	391	380	.97
All other diamines and polyamines	24,295	14,614	10,849	.74
Monoamines, total				
	122,247	58,384	48,985	.87
N,N-Dimethyloctadecylamine	1,123	...	...	...
(Hydrogenated tallow alkyl)amine	3,698	2,937	2,196	.75
N-Methyloctadecylamine	1,294	...	...	...
9-Octadecenylamine	8,513	5,454	4,366	.80
Octadecylamine	2,574	1,637	1,617	.99
(Tallow alkyl)amine	21,132	10,721	7,330	.68
All other monoamines	83,913	35,635	33,476	.94

See footnotes at end of table.

SECTION 12. SURFACE-ACTIVE AGENTS

Table 36—Continued

Surface-active agents: U.S. production and sales, 1986

Surface-active agents	Sales ^a			
	Production ¹	Quantity	Value	Unit value ³
	1,000 pounds	1,000 pounds	1,000 dollars	Per pound
Cationic—Continued				
Quaternary ammonium salts, containing oxygen	36,403	36,980	33,983	\$0.92
Quaternary ammonium salts, not containing oxygen, total	162,235	144,784	131,460	.91
Acyclic, total	128,352	119,601	100,341	.84
Bis(coconut oil alkyl)dimethylammonium chloride	1,232	1,799	2,533	1.41
Bis(hydrogenated tallow alkyl)dimethylammonium chloride	74,709	61,420	42,239	.69
Trimethyl(tallow alkyl)ammonium chloride	1,616	1,666	1,694	1.02
All other acyclic	50,795	54,716	53,875	.98
Benzenoid, total ⁴	33,883	25,183	31,119	1.24
Benzyl(coconut oil alkyl)dimethylammonium chloride	2,781	2,447	2,073	.85
Benzyl(mixed alkyl)ammonium chloride	11,732	11,027	16,727	1.52
Benzylpicolinium chloride	133	132	237	1.80
Benzyltrimethylammonium chloride	4,132	2,663	1,988	.75
All other benzenoid	15,105	8,914	10,094	1.13
All other cationic surface-active agents	7,649	4,443	29,600	6.66
Nonionic				
Total	1,717,002	1,509,193	755,410	.50
Carboxylic acid amines, total	152,643	103,710	50,699	.49
Diethanolamine condensates (amine/acid ratio=2/1), total	13,403	11,496	8,136	.71
Coconut oil acids	5,887	5,403	3,799	.70
Coconut oil and tallow acids	2,376	2,095	1,197	.57
Lauric and myristic acids	357	344	326	.95
Oleic acid	752	635	454	.72
Tall oil acids	1,023	772	521	.67
All other diethanolamine condensates (amine/acid ratio=2/1)	3,008	2,247	1,839	.82
Diethanolamine condensates (other amine/acid ratios), total	127,252	82,567	31,734	.38
Coconut oil acids (amine/acid ratio=1/1)	20,012	17,894	11,311	.63
Lauric acid (amine/acid ratio=1/1)	4,587	3,306	2,961	.90
Lauric and myristic acids (amine/acid ratio=1/1) Linoleic acid (amine/acid ratio=1/1)	1,492	1,588	1,289	.81
Soybean oil acids (amine/acid ratio=1/1)	406	396	356	.90
Stearic acid (amine/acid ratio=1/1)	1,525	1,497	797	.53
All other diethanolamine condensates (other amine/acid ratios)	136	75	47	.62
99,094	57,811	14,973	.26	
Other carboxylic acid amides, total	11,988	9,647	10,829	1.12
Coconut oil acid-ethanolamine condensate (amine/acid ratio=1/1)	1,829	...	...	...
Coconut oil acid-ethanolamine condensate (amine/acid ratio=2/1)	311	316	270	.86
All other carboxylic acid amides	9,848	9,331	10,559	1.13
Carboxylic acid esters, total	290,176	235,253	184,667	.78
Anhydrosorbitol esters, total	33,749	33,592	23,572	.70
Anhydrosorbitol monolaurate	5,969	5,957	4,288	.72
Anhydrosorbitol mono-oleate	5,112	5,145	4,026	.78
Anhydrosorbitol monostearate	18,220	18,076	11,690	.65
Anhydrosorbitol trioleate	2,185	2,373	1,688	.71
All other anhydrosorbitol esters	2,263	2,041	1,880	.92

See footnotes at end of table.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 36—Continued

Surface-active agents: U.S. production and sales, 1986

Surface-active agents	Production ¹ 1,000 pounds	Sales ²		Unit value ³ Per pound
		Quantity	Value	
		1,000 pounds	1,000 dollars	
Nonionic—Continued				
Carboxylic acid esters—Continued				
Diethylene glycol esters, total	14,824	1,221	913	\$0.75
Diethylene glycol monoaurate	242	242	131	.54
Diethylene glycol monostearate	104	106	117	1.10
All other diethylene glycol esters	14,478	873	665	.76
Ethoxylated sorbitol and anhydrosorbitol esters total	29,266	27,454	20,118	.73
Ethoxylated anhydrosorbitol monoaurate	6,188	5,692	4,779	.84
Ethoxylated anhydrosorbitol mono-oleate	7,263	7,085	4,441	.63
Ethoxylated anhydrosorbitol monostearate	12,007	10,953	7,789	.71
Ethoxylated anhydrosorbitol tricoleate	2,430	2,234	1,802	.81
Ethoxylated anhydrosorbitol tristearate	760	818	671	.82
All other ethoxylated sorbitol and anhydrosorbitol esters	618	672	636	.95
Ethylene glycol distearate	2,226	1,520	788	.52
Ethylene glycol monostearate	2,980	2,743	1,792	.65
Glycerol esters, total	70,040	62,869	50,430	.80
Complex glycerol esters	11,094	8,132	6,726	.83
Glycerol esters of chemically defined acids, total	19,526	17,527	14,605	.83
Glycerol mono-oleate	6,538	5,737	4,539	.79
Glycerol monoricinoleate	51	48	73	1.55
Glycerol monostearate	11,904	10,731	8,734	.81
All other glycerol esters of chemically defined acids	1,033	1,011	1,259	1.25
Glycerol esters of mixed acids	39,420	37,210	29,099	.78
Natural fats and oils, ethoxylated, total	32,808	26,221	22,309	.85
Castor oil, ethoxylated	13,915	11,654	7,767	.67
Hydrogenated castor oil, ethoxylated	5,924	4,799	5,097	1.06
Lanolin, ethoxylated	1,870	1,495	1,315	.88
All other natural fats and oils, ethoxylated	11,099	8,273	8,130	.98
Polyethylene glycol esters, total	49,640	42,654	30,937	.73
Polyethylene glycol diester of tall oil acids	2,735	439	279	.64
Polyethylene glycol dilaurate	794	700	618	.88
Polyethylene glycol dioleate	3,049	1,304	897	.69
Polyethylene glycol distearate	1,890	1,819	2,194	1.21
Polyethylene glycol monoester of tall oil acids	916	470	391	.83
Polyethylene glycol monoaurate	5,403	5,082	3,400	.67
Polyethylene glycol mono-oleate	4,863	4,931	3,494	.71
Polyethylene glycol monoricinoleate	19	19	24	1.28
Polyethylene glycol monostearate	6,944	5,809	5,078	.87
Polyethylene glycol sesquilester of tall oil acids	1,518	1,449	1,089	.75
Polyethylene glycol sesquinoleate	1,549	...	...	...
All other polyethylene glycol esters	19,960	20,632	13,473	.65
Polyglycerol esters, total	1,885	1,669	2,528	1.50
Polyglycerol mono-oleate	609	609	761	1.25
All other polyglycerol esters	1,276	1,060	1,767	1.67
1,2-Propanediol monostearate	1,912	1,452	2,294	1.58
All other carboxylic acid esters	50,846	33,858	28,986	.86
Ethers, total	1,255,535	1,161,466	501,750	.43
Benzenoid ethers, total ⁴	445,733	412,959	183,737	.44
Dinonylphenol, ethoxylated	4,416	3,520	2,946	.84
Dodecylphenol, ethoxylated	14,321	12,863	6,149	.48
Nonylphenol, ethoxylated	346,460	333,126	120,640	.36
Nonylphenol, ethoxylated and propoxylated	651	...	...	...
Nonylphenol-formaldehyde, alkoxyated	4,258	...	...	...

See footnotes at end of table.

SECTION 12. SURFACE-ACTIVE AGENTS

Table 36—Continued

Surface-active agents: U.S. production and sales, 1986

<i>Surface-active agents</i>	<i>Production¹</i>	<i>Sales²</i>		<i>Unit value³</i>
		<i>Quantity</i>	<i>Value</i>	
	<i>1,000</i>	<i>1,000</i>	<i>1,000</i>	<i>Per</i>
	<i>pounds</i>	<i>pounds</i>	<i>dollars</i>	<i>pound</i>
Nonionic—Continued				
Ethers—Continued				
Benzenoid ethers—Continued				
Phenol, ethoxylated	3,298	1,502	1,790	\$1.19
All other benzenoid ethers	72,329	61,948	52,212	.84
Nonbenzenoid ethers, total	725,861	686,852	269,235	.39
Chemically-defined linear alcohols, ethoxylated, total				
Decyl alcohol, ethoxylated	23,309	18,950	18,951	1.00
Dodecyl alcohol, ethoxylated	8,867	6,980	3,099	.44
9-Octadecenyl alcohol, ethoxylated	3,047	...	...	...
Octadecyl alcohol, ethoxylated	1,218	862	759	1.15
Oleyl alcohol, ethoxylated	1,425	...	...	...
All other chemically-defined linear alcohols, ethoxylated	2,753	2,428	2,570	1.06
Mixed linear alcohols, alkoxyated, total	5,999	8,880	12,523	1.41
Mixed linear alcohols, alkoxyated	702,552	667,902	250,284	.38
Mixed linear alcohols, ethoxylated .....	...	120	94	.78
Mixed linear alcohols, ethoxylated and propoxyated	616,921	587,913	224,201	.38
Tallow alcohol, ethoxylated	20,936	19,417	12,591	.65
All other mixed linear alcohols, alkoxyated	714	704	613	.87
Other ethers and thioethers, total	63,981	59,748	12,785	.21
Mixed alcohols, ethoxylated	83,941	61,655	48,778	.79
Poly(mixed ethylene, propylene) glycol	4,668	4,230	2,905	.69
Polypropylene glycol, ethoxylated	14,655	4,718	3,658	.78
Tridecyl alcohol, ethoxylated	39,119	28,689	24,367	.85
Tridecyl alcohol, propoxyated and ethoxylated	11,950	8,665	4,578	.53
Trimethylolpropane, alkoxyated	1,416	1,457	970	.69
All other ethers and thioethers	929	797	705	.88
All other nonionic surface-active agents	11,204	13,099	11,595	.89
All other nonionic surface-active agents	18,648	8,763	18,294	2.09

¹ All quantities are given in terms of 100 percent organic surface-active ingredient.

² Sales include products sold as bulk surface-active agents only.

³ Calculated from unrounded figures.

⁴ The term "benzenoid" used in this report, describes any surface-active agent, except lignin derivatives, whose molecular structure includes 1 or more 6-membered carbocyclic or heterocyclic rings with conjugated double bonds (e.g., the benzene ring or the pyridine ring).

⁵ Includes all other anionic surface-active agents.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 37

Surface-active agents for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1986

(Chemicals for which separate statistics are given in Table 36 are marked below with an asterisk (*); chemicals not so marked do not appear in Table 36 because the reported data are accepted in confidence and may not be published. Manufacturers' identification codes shown below are taken from Table 38. An "X" signifies that the manufacturer did not consent to his identification with the designated product)

<i>Surface-active agents</i>	<i>Manufacturers' identification codes (according to list in table 38)</i>
Amphoteric	
Alkyl betaine	MOA.
1,1-Bis(carboxymethyl)-2-undecyl-2-imidazolium chloride, disodium salt	BRD.
Bis(2-hydroxyethyl)allowammonium ethanoate	MIR.
3-[Caprylamidoethylene-(2-hydroxyethyl) amino-propionic acid	MIR.
Caprylamphopropionate	MOA.
1-Carboxyethyl-1-(2-ethoxycarboxyethyl)-2-cocoinimidazolium, disodium salt	SBC.
1-Carboxyethyl-1-(2-hydroxyethyl)-2-heptyl-2-imidazolium hydroxide, sodium derivative, sodium salt	MIR.
1-Carboxyethyl-1-(2-hydroxyethyl)-2-nonyl-2-imidazolium hydroxide, sodium derivative, sodium salt	MIR.
(1-Carboxyheptadecyl)trimethylammonium hydroxide, inner salt	DUP.
Carboxymethyl-3-cocoamidopropylidimethylammonium chloride, sodium salt	ENJ.
* (Carboxymethyl) [3-(coconut oil amido)propyl]-dimethylammonium hydroxide, inner salt	CYL, ETC, JOR, MIR, ONX(E), SCP, SHX. WM, WTC, X.
1-Carboxymethyl-2-heptadecyl-1-(2-hydroxyethyl)-2-imidazolium hydroxide, sodium derivative, sodium salt	MIR.
1-Carboxymethyl-1-(2-hydroxyethyl)-2-heptyl-2-imidazolium hydroxide, sodium derivative, sodium salt	MIR.
1-Carboxymethyl-1-(2-hydroxyethyl)-2-imidazolium hydroxide, sodium derivative, sodium salt	BRD.
1-Carboxymethyl-1-(2-hydroxyethyl)-2-nonyl-2-imidazolium hydroxide, sodium derivative, sodium salt	BRD, MIR.
1-Carboxymethyl-1-(2-hydroxyethyl)-2-undecyl-2-imidazolium hydroxide, sodium derivative, sodium salt	MIR.
1-Carboxymethyl-1-(2-hydroxyethyl)-2-undecyl-2-imidazolium hydroxide, sodium derivative, sodium salt	MIR.
(Carboxymethyl)-3-laurylamidopropylidimethyl ammonium hydroxide, inner salt	JOR, MIR.
Cocoamidoamphoglycinate	MOA.
Cocoamidopropyl betaine	MOA.
N-Cocoamido-propyl-N,N-dimethylamine oxide	MOA.
3-[3-(Cocoamidopropyl)dimethylammonio]-2-hydroxypropane sulfonate	MIR.
(3-Cocoamidopropyl) (2-hydroxy-3-sulfopropyl) dimethyl hydroxide, inner salt	SBC.
(3-Cocoamidopropyl)-(2-hydroxy-3-sulfopropyl)-dimethyl ammonium hydroxide, inner salt	SHX.
3-Cocoamidopropyl-2-hydroxy-3-sulfopropylidimethyl ammonium hydroxide, inner salt	JOR, SCP, SHX.
Cocoamphocarboxyglycinate	MOA.
Cocoamphocarboxypropionate	MOA.
Cocoamphopropionate	MOA.
2-Coconut-1-ethyl oxypropionic acid, sodium salt	MOA.
N-(Coconut oil alkyl)- β -alanine, partial sodium salt	SCP.

SECTION 12. SURFACE-ACTIVE AGENTS

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1986

<i>Surface-active agents</i>	<i>Manufacturers' identification codes (according to list in table 38)</i>
Amphoteric —Continued	
N-(Coconut oil alkyl)-β-alanine, sodium salt	DUP.
3-(Coconut oil alkyl)amidoethylene-(2-hydroxyethyl)-aminopropionic acid	MIR.
N-(Coconut oil alkyl)aminobutyric acid	ARC.
N,N-Di(hydroxyethyl)-N-carboxymethyl tallow ammonium quat, inner salt	SHX.
Di-(hydrogenated tallow)methylammonium tallowate	SHX.
Dimethylcleylammonium ethanoate	MIR.
N-Dodecyl-3-iminodipropionic acid	MOA.
*N-Dodecyl-3-iminodipropionic acid, disodium salt	AAC, MIR, MOA, SCP.
N-Dodecyl-3-iminodipropionic acid, monosodium salt	MIR.
N-Dodecyl-3-iminopropionic acid, monosodium salt	SCP.
Heptadecylmethylbenzimidazole sulfonic acid, sodium salt ..	BRD
Hexylisonanylamidocarboxylic acid, monoethanolamine salt ...	STC.
1-(2-Hydroxyethyl)-2-heptyl-3-carboxyethyl-imidazolinium, sodium salt	SCP.
1-Hydroxyethyl-1-(2-hydroxy-3-sodium sulfonatopropyl)-2-capryl-2-imidazolium hydroxide	MIR.
1-Hydroxyethyl-1-(2-hydroxy-3-sodium sulfonatopropyl)-2-nor-(coconut oil fatty acids)-2-imidazolium hydroxide	MIR.
1-Hydroxyethyl-1-(2-hydroxy-3-sodium sulfonatopropyl)-2-oleyl-2-imidazolium hydroxide	MIR.
1-(2-Hydroxyethyl)-1-(sodium carboxymethylene-oxyethylene)-2-nor-(coconut oil fatty acids)-2-imidazolium hydroxide	MIR.
Isodecyloxypropyliminopropionic acid, monosodium salt	ENJ.
Isonanylamidocaproic acid, triethanolamine salt	STC.
Isostearic amphopropionate	MOA.
Lauroamphocarboxyglycinate	MOA.
Laurylamidopropyl betaine	MOA.
Laurylamphoglycinate	MOA.
Mixed acyclic primary amines, ethoxylated and sulfated, sodium salt	RH.
(Mixed alkyl)sulfobetaine	BRD, MOA, WM, X.
Oleic acid-ethylenediamine condensate, propoxylated and sulfated, sodium salt	MOA.
Oleyl betaine	SCP.
1-(Sodium carboxyethylene)-1-(sodium carboxymethylene-oxyethylene)-2-nor-(tall oil fatty acids)-2-imidazolium hydroxide	MIR.
1-(Sodium carboxymethyl)-1-(sodium carboxymethylene-oxyethylene)-2-nor-(coconut oil fatty acids)-2-imidazolium lauryl sulfate	MIR.
*N-(Tallow alkyl)-3-iminodipropionic acid, disodium salt	MIR, MOA, SCP.
Tridecyloxypoly(ethyleneoxy)propionic acid, potassium salt ..	MRV.
All other amphoteric surface-active agents	AAC, CGY, DUP, S, X.
Anionic	
Carboxylic acids (and salts thereof):	
Amine salts of fatty, rosin, and tall oil acids:	
Coconut oil acids, diethanolamine salt	SHX.
Coconut oil acids, ethanolamine salt	SBP.
Coconut oil acids, triethanolamine salt	DA(E).

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1986

<i>Surface-active agents</i>	<i>Manufacturers' identification codes (according to list in table 38)</i>
Anionic—Continued	
Carboxylic acids (and salts thereof)—Continued	
Amine salts of fatty, rosin, and tall oil acids—Continued	
Isooleic acid, triethanolamine salt	PCI.
Oleic acid, mixed isopropanolamine salt	X.
Oleic acid, morpholine salt	X.
Oleic acid, triethanolamine salt	CPC, X.
3-Propanoic acid, coco-amino, sodium salt	PCI.
Rosin acids, triethanolamine salt	CPC.
Stearic acid, N,N,N',N'-tetrakis(2-hydroxyethyl)- ethylenediamine salt	ICI.
*Stearic acid, triethanolamine salt	AAC, GLY, PCI, SBP, X.
Tall oil acids, diethanolamine salt (Condensate)	SHX.
Tallow acids, triethanolamine salt	SBP.
All other amine salts of fatty, rosin, and tall oil acids	S, X.
Carboxylic acids having amide, ester, or ether linkages:	
Butoxyethylene oxyacetic acid, sodium salt	MIR.
5(or 6)-Carboxy-4-hexyl-2-cyclohexene-1-octanoic acid, reaction products with castor oil	X.
N-(Coconut oil acyl)sarcosine, sodium salt	HMP.
Dodecyloxypoly(ethyleneoxy)acetic acid, sodium salt	MIR.
N-Lauroylsarcosine, sodium salt	HMP.
Maleic acid, monoalkyl ester	X.
Mixed(secondary linear alcohol)polyethylene proprionic acid, sodium salt	CHP.
Naphthenic acid, ethoxylated	X.
Poly(oxy-1,2-ethanediyl), ω-(2-carboxyethoxy)-ω'- hydroxy-α,α'-(iminodi-2,1-ethanediyl)- bis-,N-(tallow alkyl derive), potassium salt	MIR.
Poly(oxy-1,2-ethanediyl)-α-carboxy methyl, ω- (tri-decyloxy), potassium salt	PCI.
Tridecyloxypoly(ethyleneoxy)acetic acid, sodium salt	HMP.
Carboxylic acids with amide, ester or ether linkage, other	
Potassium and sodium salts of fatty, rosin, and tall oil acids:	DA(E).
Alkoxy triacryl titanate	KPI.
Animal grease, sodium salt	NMC.
5(or 6)carboxy-4-hexyl-2-cyclohexene-1-octanoic acid, potassium/sodium salts	X.
Castor oil acids, sodium salt	DEX.
Citric acid, sodium salts (50%) in sodium phosphates (20%	LEV, STC.
*Coconut oil acids, potassium salt	AGP, CON, ESS, HEW, HIP, HNT, LAS, LUR, NMC, PG, PNx, SOP.
*Coconut oil acids, sodium salt	BSW, CON, CP, HEW, LAS, LEV, NMC, NPR, PG, SOP, X.
Corn oil acids, potassium salt	HNT, NMC.
2-Ethylhexanoic acid, potassium salt	UPF.
Gluconic acid, potassium and sodium salts with 20 percent mix of sodium bisulfite-formaldehyde	STC.
Heptanoic acid, potassium salt	X.

SECTION 12. SURFACE-ACTIVE AGENTS

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1986

<i>Surface-active agents</i>	<i>Manufacturers' identification codes (according to list in table 38)</i>
Anionic—Continued	
Carboxylic acids (and salts thereof)—Continued:	
Potassium and sodium salts of fatty, rosin, and tall oil acids—Continued	
Hexyl(isonanoyl anide)carboxylic acid, mono- and triethanolamine salts	STC.
Hexyl(isonanoyl anide)carboxylic acid, di- and triethanolamine salts	STC.
Isonanoic acid, sodium salt	STC.
Isostearic acid, isopropoxy titanium salt	KPI.
Lauric acid, potassium salt	PG.
Mixed vegetable fatty acids, potassium salt	EFH, GRL, QCP.
Mixed vegetable fatty acids, sodium salt	NMC, QCP.
Naphthenic acid, potassium salt	WBG.
Neoalkoxy, trineodecanoyl titanate	KPI.
Neoalkoxy, trineodecanoyl zirconate	KPI.
Oleic acid, ammonium salt	CCC.
Oleic acid, epoxidized, ammonium salt	SCP.
Oleic acid, potassium salt	BSW, DA(E), HAL, HNT, PG, WBG, X.
Oleic acid, sodium salt	BSW, DA(E), WBG.
Olive oil acids, sodium salt	HNT.
Palm kernel oil acids, potassium salt	PG.
Palm kernel oil acids, sodium salt	LAS, NMC, PG.
Palm oil acids, sodium salt	BSW, HEW, LAS.
Rosin acids, potassium salt	ARZ, PG, WVA, X.
Rosin acids, sodium salt	ARZ, SLM(E), X.
Soybean oil acids, potassium salt	DA(E), PNK.
Stearic acid, ammonium salt	BSW.
Stearic acid, potassium salt	CCC, CON, DA(E), HEW.
Stearic acid, sodium salt	CON, DA(E), NOC, SYP, WTC.
Tall oil acids	WVA.
*Tall oil acids, potassium salt	CCC, CON, DA(E), DAN, ESS, HIP, HNT, PNK, SOP, WVA.
Tall oil acids, sodium salt	CON, NMC, WVA, X.
Tallow acids, potassium salt	AGP, PG, PNK.
*Tallow acids, sodium salt	BSW, CON, CP, DA(E), HEW, LAS, LEV, NMC, NPR, PG, X.
All other potassium and sodium salts of fatty, rosin, and tall oil acids	BRI, DA(E), USR.
All other carboxylic acids	WVA.
Phosphoric and polyphosphoric acid esters (and salts thereof):	
Alcohols and phenols, alkoxyated and phosphated:	
Amyl alcohol, ethoxylated and phosphated	GAF.
Butyl alcohol, ethoxylated and phosphated	ETC, GAF.
*Decyl alcohol, ethoxylated and phosphated	BRI, ETC, GAF, JOR, MCB, MCP, RPC, TCH.
Decyl alcohol, ethoxylated and phosphated, potassium salt	ETC, GAF.
Decyl alcohol, ethoxylated and polyphosphated	ETC.
Decyl alcohol, potassium salt	RPC.
*Dinonylphenol, ethoxylated and phosphated	CPC, ETC, GAF, JOR, WTC.
Dinonylphenol, ethoxylated and phosphated, barium salt	WTC.
Distyrenated phenol, ethoxylated	GAF.
Dodecyl alcohol, ethoxylated and phosphated	CPC, GAF, STC.
Dodecylphenol, ethoxylated and phosphated	DEX, GAF.
2-Ethylhexanol and ethoxylated nonylphenol, polyphosphated	CCC.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1986

<i>Surface-active agents</i>	<i>Manufacturers' Identification codes (according to list in table 38)</i>
Anionic—Continued	
Phosphoric and polyphosphoric acid esters (and salts thereof)—Continued:	
Alcohols and phenols, alkoxylated and phosphated—Cont.	
2-Ethylhexanol and ethoxylated nonylphenol, polyphosphated, sodium salt	CCC.
2-Ethylhexanol, ethoxylated and phosphated	DA(E), ETC, STC.
2-Ethylhexanol, ethoxylated and phosphated, potassium salt	BRI, ETC.
2-Ethylhexanol, phosphated, potassium salt	MCB.
Hexyl alcohol, ethoxylated and phosphated	GAF.
Hexyl alcohol, phosphated, potassium salt, solubilized	MCB.
Mixed linear alcohols, alkoxylated and phosphated, potassium salt	PCI.
*Mixed linear alcohols, ethoxylated and phosphated	CHC, CRT, CTL, CYL, DA(E), ENJ, ETC, FER, FTX, GAF, HIP, HRT, JOR, LVR, MCB, MOA, MRV, RPC, STC, TCH, WTC, X, X.
Mixed linear alcohols, ethoxylated and phosphated, sodium salt	CHP.
Mixed linear alcohols, polyoxalkylated and phosphated	GAF.
Mixed tridecyl alcohol and 2-ethylhexanol, phosphated, potassium salt	CHP.
Nonylphenol/diethylenetriamine blend	GAF.
*Nonylphenol, ethoxylated and phosphated	CRT, CTL, CYL, DA(E), DEX, ENJ, ESS, ETC, GAF, GDC, HRT, JOR, LUR, MCB, MCP, MOA, MZC, OMC, RPC, SOP, STC, TCC, WTC.
Nonylphenol, ethoxylated and phosphated, diethanolamine salt	OMC, WTC.
Nonylphenol, ethoxylated and phosphated, partial sodium salt	GAF.
Nonylphenol, ethoxylated and phosphated sodium salt	WTC.
9-Octadeceny alcohol, ethoxylated and phosphated	GAF, STC.
9-Octadecyl alcohol, ethoxylated and phosphated	GAF.
Octylphenol, ethoxylated and phosphated	RH, RPC, WTC.
Octylphenol, ethoxylated and phosphated, magnesium salt	ONX(E).
Oleyl alcohol, ethoxylated and phosphated	ETC.
*Phenol, ethoxylated and phosphated	ETC, GAF, JOR, MCB, MIL, MOA, MZC, PEL, TCH, WTC.
*Polyhydric alcohol, ethoxylated and phosphated	CYL, DEX, GAF, STC.
Tridecyl alcohol, ethoxylated and phosphated, polyalkylene polyamine salt	X.
*Tridecyl alcohol, ethoxylated and phosphated	DAN, DEX, ETC, GAF, HIP, MIL, STC, X.
Tridecyl alcohol, ethoxylated and phosphated, potassium salt	DEX, ETC.
Tridecyl alcohol, ethoxylated and phosphated, triethanolamine salt	ETC.
All other alcohols and phenols, alkoxylated and phosphated or polyphosphated	BRI.
Alcohols, phosphated or polyphosphated:	
Butyl methyl pyrophosphate ethylenedioxy titanium salt/N,N-dimethylaminoethylmethacrylate salt	KPI.
Butyl methyl pyrophosphate isopropoxy titanium salt octyl phosphite adduct	KPI.
Butyl phosphate, potassium salt	DUP.
*Decyl and octyl phosphate	DA(E), MZC, STC.
Decyl polyphosphate, sodium salt	CRD.

SECTION 12. SURFACE-ACTIVE AGENTS

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1986

Surface-active agents	Manufacturers' identification codes (according to list in table 38)
Anionic—Continued	
Phosphoric and polyphosphoric acid esters (and salts thereof)—Continued	
Alcohols, phosphated or polyphosphated—Continued:	
Eicosanyl alcohol, phosphated	ETC.
*2-Ethylhexyl phosphate	CHP, GAF, MCP, OMC.
2-Ethylhexyl phosphate, potassium salt	PCI.
*2-Ethylhexyl phosphate, sodium salt	CHP, DAN, ENJ, PAT, SDC.
2-Ethylhexyl polyphosphate, sodium salt	DEX, SFS.
Hexadecyldiphosphate	X.
Hexadecylmonophosphate	X.
Hexyl phosphate	ETC, ICI.
Hexyl phosphate, potassium salt	ICI, STC.
Isocetyl phosphate	BOE, BRI.
Lauryl alcohol, phosphated	STC.
Lauryl alcohol, phosphated, potassium salt	BOE.
Methylbutyl pyrophosphate, ethylenedioxy titanium salt	KPI.
*Mixed alkyl phosphate	CTL, DUP, ETC, SCP, SFS, STC, WTC, X.
Mixed alkyl phosphate, alkylamine salt	X.
Mixed alkyl phosphate, diethanolamine salt	DUP, SCP.
Mixed alkyl phosphate, potassium salt	STC.
Mixed alkyl phosphate, sodium salt	X.
Mixed alkyl phosphate, triethanolamine salt	X.
Neoalkoxy tris(dioctyl)phosphato zirconate	KPI.
Neoalkoxy tris(dioctyl)pyrophosphato zirconate	KPI.
Octyl diphosphate, oxoethylene titanium salt	KPI.
Octyl phosphate	SCP, WTC.
Octyl phosphate, alkylamine salt	X.
Octyl phosphate, isoproxy titanium salt	KPI.
Octyl phosphate, neoalkoxy titanium salt	KPI.
Octyl phosphate, potassium salt	DEX.
Octyl polyphosphate	DEX.
Octyl pyrophosphate, ethylenedioxy titanium salt	KPI.
Octyl pyrophosphate, ethylenedioxy titanium salt/dimethylaminomethacrylate salt	KPI.
Octyl pyrophosphate, isoproxy titanium salt	KPI.
Octyl pyrophosphate, neoalkoxy titanium salt	KPI.
Octyl pyrophosphate, oxoethylenedioxy titanium salt	KPI.
Octyl pyrophosphate, titanium salt	KPI.
Pentaerythritol phosphate	JOR.
N-2(C ₈ to C ₁₇)alkylamido-N-carboxyethyl, N-2-hydroxyethyl, 3-amino-2-hydroxypropyl phosphate, disodium salt	MOA.
Tridecyl phosphate	STC.
All other phosphated and polyphosphated alcohols	BRI, DA(E), HRT.
Other phosphoric and polyphosphoric acid esters:	
Alkylphosphoramidic acid, mixed alkyl amine salts	X.
Blend of fatty and phosphate esters	MIL.
Glycerol, ethoxylated and phosphated	X.
Glycerol monoester of mixed fatty acids, phosphated	WTC.
Polyoxyalkylate (fatty alcohol), phosphate ester	BAS.
Stearyl amine polyphosphoric acid, ethoxylated	GDC.
All other phosphoric and polyphosphoric acid esters	MOA, SFS, VTC, WTC.
Sulfonic acids (and salts thereof):	
Alkylbenzenesulfonates:	
Dodecylbenzenesulfonates:	
*Dodecylbenzenesulfonic acid	CTL, EMK(E), JLP, LEV, PIL, PLX, STP, TCI, TEN, VST, WTC, X.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1986

<i>Surface-active agents</i>	<i>Manufacturers' identification codes (according to list in table 38)</i>
Anionic—Continued	
Sulfonic acids (and salts thereof)—Continued	
Alkylbenzenesulfonates—Continued	
Dodecylbenzenesulfonates—Continued	
Dodecylbenzenesulfonic acid, (mixed alkyl)amine salt ..	ECC, HIP, X.
Dodecylbenzenesulfonic acid, ammonium salt	CCC, LEV, X.
*Dodecylbenzenesulfonic acid, calcium salt	ICI, RH, STC, STP, TMH, WTC, X.
Dodecylbenzenesulfonic acid, ethoxylated, oleyl amine salt	STC.
Dodecylbenzenesulfonic acid, diethanolamine salt	PCI, VPC.
Dodecylbenzenesulfonic acid, DMAP salt	WTC.
Dodecylbenzenesulfonic acid, isopropanolamine salt ...	PIL.
*Dodecylbenzenesulfonic acid, isopropylamine salt	CIN, CTL, ICI, STP, WTC, X.
Dodecylbenzenesulfonic acid, isopropoxy titanium salt ...	KPI.
*Dodecylbenzenesulfonic acid, monoethanolamine salt ..	FTX, PCI, RCI.
Dodecylbenzenesulfonic acid, potassium salt	BRI, GDC.
*Dodecylbenzenesulfonic acid, sodium salt	AAC, BLA, BOE, BRI, CP, CPC, CRT, CTL, DOW, DUP, ECC, JLP, LEV, NMC, PCI, PG, PIL, PLX, PNX, RPC, SOP, STP, TEN, WTC.
*Dodecylbenzenesulfonic acid, triethanolamine salt	AAC, BRD, BRI, CCC, CPC, CTL, ESS, FTX, PCI, PIL, STP, WTC.
All other dodecylbenzenesulfonates	MRV.
Benzenesulfonic acid	WTC.
Isopropyl-4-aminobenzenesulfonyl-di(dodecylbenzene- sulfonyl) titanate	KPI.
Neoalkoxy, dodecylbenzene-sulfonyl titanate	KPI.
Tridecylbenzenesulfonic acid	PLX.
*Tridecylbenzenesulfonic acid, sodium salt	BLA, CMT, CP, LAS, NPR, PG, STP.
Benzene-, cumene-, toluene-, and xylenesulfonates:	
Benzenesulfonic acid, 3,3'-(1-methylethylidene)- bis(6-hydroxydisodium salt), polymer with formaldehyde and 4,4'-sulfonylbis(phenol)	DA(E).
Cumenesulfonic acid, ammonium salt	NES.
Cumenesulfonic acid, sodium salt	DA(E), NES, STP, WTC.
Toluenesulfonic acid, potassium salt	NES.
Toluenesulfonic acid, sodium salt	NES, PG, VST.
(Toluene-xylene)sulfonic acid	WTC.
Xylenesulfonic acid, ammonium salt	NES, PG, STP.
*Xylenesulfonic acid, sodium salt	ICI, NES, PIL, SDC, SHC, STP, WTC.
Ligninsulfonates:	
Ligninsulfonic acid, aluminum salt	DA(E).
*Ligninsulfonic acid, ammonium salt	MAR, PSP, RAY, SPA.
*Ligninsulfonic acid, calcium salt	FPC, LKY, MAR, PSP.
Ligninsulfonic acid, chromium salt	MAR, PSP, RAY.
Ligninsulfonic acid, iron salt	MAR, PSP.
Ligninsulfonic acid, magnesium salt	MAR.
Ligninsulfonic acid, manganese salt	MAR.
Ligninsulfonic acid, mixed chromium and iron salts	PSP.
Ligninsulfonic acid, potassium salt	PSP.
*Ligninsulfonic acid, sodium salt	ENJ, MAR, PSP, RAY.
Ligninsulfonic acid, zinc salt	MAR, PSP.
Naphthalenesulfonates:	
Butylnaphthalenesulfonic acid, sodium salt	DA(E), ECC, UDI.
Butyl-o-phenylphenol sulfonic acid, sodium salt	RBC.
Di(C ₈ -C ₁₀ alkyl)naphthalenesulfonic acid	X.
Dibutylnaphthalenesulfonic acid	UDI.
*Diisopropylnaphthalenesulfonic acid, sodium salt	DA(E), DUP, UDI.

SECTION 12. SURFACE-ACTIVE AGENTS

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1986

<i>Surface-active agents</i>	<i>Manufacturers' identification codes (according to list in table 3B)</i>
Anionic—Continued	
Sulfonic acids (and salts thereof)—Continued	
Naphthalenesulfonates—Continued	
Isopropyl naphthalenesulfonic acid	UDI.
Methylnaphthalenesulfonic acid, sodium salt	BOE, CPC, DA(E), UDI.
Methylnonylnaphthalenesulfonic acid, sodium salt	UDI.
Naphthalenesulfonic acid, ammonium salt	DA(E).
Naphthalenesulfonic acid, sodium salt, formaldehyde condensate	UDI.
All other naphthalenesulfonates	HAL, ICI.
Sulfonic acids having amide linkages:	
Sulfosuccinamic acid derivatives:	
N-(Coconut oil alkyl)sulfosuccinamic acid, disodium salt	SCP.
N-(1,2-Dicarboxyethyl)-N-octadecylsulfosuccinamic acid, tetrasodium salt	ACY, MOA.
N-Octadecylsulfosuccinamic acid, disodium salt	ACY.
Oleamidisulfosuccinamic acid, disodium salt	SBC.
N-(Oleoyloxyisopropyl)sulfosuccinamic acid	WTC.
Taurine derivatives:	
N-(Coconut oil acyl)-N-methyltaurine, sodium salt ...	FTX, GAF.
N-Methyl-N-oleoyltaurine, sodium salt	CPC, GAF, MRT, STC.
N-Methyl-N-palmitoyltaurine, sodium salt	GAF.
N-Methyl-N-(tall oil acyl)taurine, sodium salt	CCC, FTX, GAF.
All other sulfonic acids having amide linkages	STC, TCM.
Sulfonic acids having ester or ether linkages:	
Sulfosuccinic acid esters:	
Sulfosuccinic acid, bis(dibutyl)ester, amidodisodium salt	MOA.
Sulfosuccinic acid, bis(2,6-dimethyl-4-heptyl)-ester, sodium salt	MOA, NSC.
*Sulfosuccinic acid, bis(2-ethylhexyl)ester, sodium salt	ACC, ACY, BRI, CCC, CHP, CRT, ECC, EMK(E), ENJ, FTX, HDG, MCP, MOA, RH, RPC, STC, WTC.
Sulfosuccinic acid, dihexyl ester, sodium salt	ACY, MOA.
Sulfosuccinic acid, dilauryl ester, sodium salt	ACY.
*Sulfosuccinic acid, dilauryl ester, sodium salt	DA(E), SHX, SOS, WTC.
Sulfosuccinic acid, dioctyl ester, sodium salt	MOA.
Sulfosuccinic acid, dipentyl ester, sodium salt	ACY, DA(E).
*Sulfosuccinic acid, ditridecyl ester, sodium salt	ACY, DA(E), MOA.
Sulfosuccinic acid, (coconut oil alkyl)-iminopropanol half-ester, sodium salt	MOA.
Sulfosuccinic acid, (lauryl polyethylene glycol ether) ester, disodium salt	MOA, SHX.
Sulfosuccinic acid, monolauramide ester, disodium salt	MOA.
Sulfosuccinic acid, monolaurate ester, disodium salt	MIR, MOA.
Sulfosuccinic acid, monolauryl(polyethoxy)ester, disodium salt	TCH.
Sulfosuccinic acid, mono-oleamidopolyethyleneglycol ester, disodium salt	SCP.
Sulfosuccinic acid, myristyl ester, disodium monoethanolamine salt	WTC.
Sulfosuccinic acid, nonoxynyl-10 ester, disodium salt	MOA.
Sulfosuccinic acid, oleamidopolyethyleneglycol, disodium salt	MOA.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1986

Surface-active agents	Manufacturers' identification codes (according to list in table 38)
Anionic—Continued	
Sulfonic acids (and salts thereof)—Continued	
Sulfonic acids having ester or ether linkages—Continued	
Sulfosuccinic acid esters—Continued	
All other sulfosuccinic acid esters	AAC, WTC.
All other sulfonic acids having ester or ether linkages:	
Coconut oil acids, 2-sulfoethyl ester, sodium salt	DA(E), FTX, GAF, HDG, JOR, LEV.
Diphenyloxidesulfonic acid-formaldehyde condensate	CTL.
Dipolyetherdisulfonic acid, diethanolamine salt	VPC.
Dodecyldiphenyloxidedisulfonic acid	X.
Dodecyldiphenyloxidedisulfonic acid, disodium salt ...	CTL.
Dodecyl sulfoacetate	DA(E).
Dodecyl sulfoacetate, sodium salt	STP.
2-Hydroxy, 3-(lauryl-myristyl) (oxy-1-propane-sulfonic acid), sodium salt	PG.
Is-octylphenol, ethoxylated and sulfonated, sodium salt	RH.
n-Octylphenol, ethoxylated and sulfonated, sodium salt	AAC.
Petroleum sulfonic acid, calcium salt	WTC.
All other sulfonic acids with ether linkages	DA(E).
Other sulfonic acids:	
Allyl sulfonate, sodium salt	ARD.
Diphenylsulfone sulfonic acid, potassium salt	UPF.
(Mixed alkane)sulfonic acid	X.
* (Mixed alkane)sulfonic acid, sodium salt	AAC, DUP, ONX(E), WTC, WVA, X, X.
n-Octanesulfonic acid, sodium salt	X.
Oleyloxyethylamide oxypropanol sulfonic acid	S.
Petroleum sulfonic acid, water soluble (Acid layer), sodium salt	PIL.
Styrene-maleic anhydride copolymer, sulfonated, sodium salt	X.
All other sulfonic acids	CLU, HAL, SLM, STP, WTC.
Sulfuric acid esters (and salts thereof):	
Acids, amides, and esters, sulfated:	
Carboxylic acid esters (except natural fats and oils), sulfated:	
Esters of sulfated oleic acid:	
* Butyl oleate, sulfated, sodium salt	HIP, ICI, LVR, MCP, MRV, NSC.
Butyl and propyl oleate, sulfated, sodium salt	CRT.
Isopropyl oleate, sulfated, sodium salt	DEX.
Methyl oleate, sulfated, sodium salt	DA(E), ICI.
Oleic acid, sulfated	ACT.
Oleic acid, sulfated, disodium salt	MCP, TEN.
Oleic acid, sulfated, sodium salt	ACY.
Propyl oleate, sulfated, sodium salt	MRV.
All other esters of sulfated oleic acid	DA(E).
Other carboxylic acid esters:	
Coconut oil acids-ethanolamine salt, sulfated, potassium salt	EMK(E).
Glycerol monoester of coconut oil acids, sulfated, sodium salt	CP.
Mixed alkyl phenol sulfate, ethoxylated, triethanolamine salt	MIL.
9-Octadecenyl acetate, sulfated, sodium salt	DUP.
Tall oil acids, sulfated, sodium salt	ICI.

SECTION 12. SURFACE-ACTIVE AGENTS

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

<i>Surface-active agents</i>	<i>Manufacturers' identification codes (according to list in table 38)</i>
Anionic—Continued	
Sulfuric acid esters (and salts thereof)—Continued	
Alcohols, sulfated:	
Dodecylsulfate salts:	
*Dodecyl sulfate, ammonium salt	AAC, BRD, CTL, CYL, LEV, ONX(E), STP, TCH, TNI, WTC, X.
Dodecyl sulfate, diethanolamine salt	BRD, DUP, JRG, ONX(E), TCH.
Dodecyl sulfate, N,N-diethylcyclohexylamine salt	DUP.
Dodecyl sulfate, isopropanolamine salt	JRG.
Dodecyl sulfate, magnesium salt	AAC, BRD, CYL, ONX(E).
Dodecyl sulfate, potassium salt	PG.
*Dodecyl sulfate, sodium salt	AAC, BRD, CTL, DUP, ONX(E), STP, TCH, WTC.
*Dodecyl sulfate, triethanolamine salt	AAC, BRD, CYL, ONX(E), STP, TCH, TNI.
Decyl and octyl sulfate, sodium salt	TCH.
Decyl sulfate, sodium salt	AAC, SCP, WTC.
3,9-Diethyl-8-tridecyl sulfate, sodium salt	NCC.
*2-Ethylhexyl sulfate, sodium salt	AAC, BRD, NCC, PCI, SCP, TCH, WTC.
7-Ethyl-2-methyl-4-undecyl sulfate, sodium salt	NCC.
Hexadecyl sulfate, monoethanolamine salt	LUR.
Hexadecyl sulfate, sodium salt	AAC.
Hexyl sulfate, potassium salt	DEX.
Lauryl sulfate, sodium salt	MOA.
*Mixed linear alcohols, sulfated, ammonium salt	CP, NTL, PG, S, SCP, WTC, X.
Mixed linear alcohols, sulfated, diethanolamine salt	SCP.
Mixed linear alcohols, sulfated, magnesium salt	WTC.
Mixed linear alcohols, sulfated, mixed sodium/cocodiethanolamine salts	AAC.
*Mixed linear alcohols, sulfated, sodium salt	AAC, DA(E), DUP(E), ONX, PG, SCP, WTC.
*Mixed linear alcohols, sulfated, triethanolamine salt	ONX(E), PG, SCP, WTC.
*Octyl sulfate, sodium salt	AAC, APX, DUP.
Oleyl sulfate, sodium salt	DUP.
Oxalcohol bottoms, sulfated, sodium salt	WVA.
Tridecyl sulfate, sodium salt	AAC.
All other linear alcohols, sulfated	DA(E), LEV.
Ethers, sulfated:	
Alkylphenols, ethoxylated and sulfated:	
(Mixed alkyl)phenol, ethoxylated and sulfated, sodium salt	X.
1-Naphthol, ethoxylated and sulfated, free acid	TCH.
Nonylphenol, ethoxylated and sulfated, ammonium salt	ENJ, GAF, RPC, STP.
Nonylphenol, ethoxylated and sulfated, sodium salt	GAF.
Octylphenoxypolyethoxyethyl sulfate	RH.
All other sulfated cyclic ethers	STP(E), WVA(E).
Dodecyl alcohol, ethoxylated and sulfated, ammonium salt	AAC, MOA, STP.
*Dodecyl alcohol, ethoxylated and sulfated, sodium salt	AAC, CTL, CYL, ONX(E), SCP, STP, TCH.
Dodecyl and tetradecyl alcohols, ethoxylated and sulfated, ammonium salt	X.
Dodecyl and tetradecyl alcohols, ethoxylated and sulfated, magnesium salt	PG.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1986

<i>Surface-active agents</i>	<i>Manufacturers' identification codes (according to list in table 38)</i>
Anionic—Continued	
Sulfuric acid esters (and salts thereof)—Continued	
Alcohols, sulfated—Continued	
*Mixed linear alcohols, ethoxylated and sulfated, ammonium salt	BRD, ONX(E), PG, SCP, SHC, STP, VST, WTC, X, X.
Mixed linear alcohols, ethoxylated and sulfated, diethanolamine salt	SCP.
*Mixed linear alcohols, ethoxylated and sulfated, sodium salt	AAC, BRD, DUP, GAF, ONX(E), PG, PIL, SCP, SHC, SHX, STP, TCH, TCI, VST, WTC, WVA.
Tridecyl alcohol, ethoxylated and sulfated, ammonium salt	ARC.
Tridecyl alcohol, ethoxylated and sulfated, sodium salt	AAC, BRD.
All other sulfated ethers	AAC.
Natural fats and oils, sulfated:	
Castor oil, sulfated, sodium salt	ACT, ACY, ARL, CRT, DA(E), DEX, HIP, ICI, LEA, LUR, MRV, SCP, SEA, SLM(E), WHW.
Coconut oil, sulfated, sodium salt	ACY.
Cod oil, sulfated, sodium salt	SEA, WHW.
Grease, other than wool, sulfated, sodium salt	WHW.
Herring oil, sulfated	SLM(E).
Herring oil, sulfated, sodium salt	SEA, SLM(E), WHW.
Lard, sulfated, sodium salt	CIN, WHW.
Mixed fish oils, sulfated, ammonium salt	CIN.
*Mixed fish oils, sulfated, sodium salt	CIN, SLM(E), WHW.
Mixed vegetable oils, sulfated, sodium salt	CPC.
Mustard seed oil, sulfated, sodium salt	DA(E).
*Neatsfoot oil, sulfated, sodium salt	SEA, SLM(E).
Peanut oil, sulfated, sodium salt	ACY.
Pecan oil, sulfated, sodium salt	CRT.
Pine oil, sulfated	SCM.
Ricebean oil, sulfated, sodium salt	DA(E).
Soybean oil, sulfated, sodium salt	ACT, WHW.
Tall Oil, sulfated, ammonium salt	CIN.
*Tall oil, sulfated, sodium salt	ACT, APX, CIN, SOS, WHW, WVA.
*Tallow, sulfated, sodium salt	ACY, CCC, ECC, LUR, NSC, SLM(E), SOS, WHW.
All other natural fats and oils, sulfated	DA(E), WVA.
All other sulfuric acid esters	BFP, DA(E), SLM(E).
Other anionic surface-active agents:	
Alkylalcohol ethoxylated and carbonated, sodium salt ...	MIL, S.
Ethoxylated acetic acid, sodium salt	S.
Half-phthalic acid ester of tallow alkanolamide/ monoglyceride	EFH.
Lignin, sodium salt	WVA.
Maleated esterified tall oil	ENP.
Maleated linseed oil	ENP.
Mixed linear alcohols, ethoxylated and carbonated, sodium salt	S.
Nonylphenol, ethoxylated and carbonated, sodium salt ...	WTC.
Tridecyl alcohol, ethoxylated and carbonated, sodium sodium salt	S.
All other anionic surface-active agents	DUP, SLM(E), WVA.

SECTION 12. SURFACE-ACTIVE AGENTS

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1986

Surface-active agents	Manufacturers' identification codes (according to list in table 36)
Cationic	
Amine oxides and oxygen-containing amines (except those having amide linkages):	
Acyclic:	
3-(C ₁₂ -C ₁₅ alkyloxy)-1-propanamine	ENJ.
3-(C ₁₂ -C ₁₅ alkyloxy)-1-propanamine	ENJ.
(C ₁₂ -C ₁₅) Alkylpropylamine, ethoxylated	SVC.
N-(C ₁₂ -C ₁₅ alkyl)oxypropyl trimethylene diamine	ENJ.
Bis-hydroxyethyl-cocoamine oxide, phosphated, potassium salt	JOR.
N,N-Bis(2-hydroxyethyl)dodecylamine	SHX.
Bis-(2-hydroxyethyl)isodecylpropylamine oxide	ENJ.
N,N-Bis(2-hydroxyethyl)octadecylamine	ARC, SHX.
N,N-Bis(2-hydroxyethyl) (tallow alkyl)amine	ARC, MZC, SHX, STC.
N,N-Bis(2-hydroxyethyl) (tallow alkyl)amine acetate	MZC.
tert-Butylbenzylamine	HXL.
Cocoamidopropyl dimethyl amine	X.
*(Coconut oil alkyl)amine, ethoxylated	ARC, ENJ, ICI, MZC, SHX, SVC, TCH, WTC, X, X.
(Coconut oil alkyl)amine, ethoxylated, acetate	BRD, X.
Cocoylamidopropyl dimethylamine oxide	SCP.
Diethylenetriamine, ethoxylated and propoxylated	X.
Diethylenetriamine, propoxylated	X.
N,N-Dimethyldodecylamine oxide	JOR, PG, SHX.
N,N-Dimethylhexadecylamine oxide	ARC, BRD, ONX(E).
N,N-Dimethyl(mixed alkyl)amine oxide	PG, S.
N,N-Dimethyloleylamine oxide	SCP.
Dimethyltetradecylamine oxide	X.
Di(pyrrolidonyl)imine	PCI.
Ethylenediamine, alkoxyated	X.
Ethylenediamine ethoxylated	KPI.
Ethylenediamine, propoxylated	WTC.
Hexyloxypropyl amine	DUP, ENJ.
*(Hydrogenated tallow alkyl)amine, ethoxylated	ENJ, ETC, SHX, SVC, WTC.
N-(2-Hydroxyethyl)-N,N',N'-tris(2-hydroxypropyl)-ethylenediamine	ONX(E).
Isodecylpropylamine	ENJ.
Isodecylpropylamine, ethoxylated	ENJ, SVC.
N-Isodecylpropyl trimethylene diamine	ENJ.
Isononyloxypropylamine	ENJ.
Isopropoxy-tris(2-Ethylenediamino)ethyl titanate	KPI.
Isotridecylpropylamine	ENJ.
Isotridecylpropylamine, ethoxylated	SVC.
N-Isotridecylpropyl trimethylene diamine	ENJ.
Jet amine ether diamine	JTO.
3-(Mixed alkoxy)propylamine, ethoxylated oxides	SHX.
(Mixed alkyl)amine, ethoxylated	ICI, RH, SHX.
Mixed tert-alkyl primary amines, ethoxylated	X.
Neoalkoxy, tri(m-amino)-phenyl titanate	KPI.
Neoalkoxy, tris(m-amino)-phenyl zirconate	KPI.
Neoalkoxy, tris(ethylenediamino) zirconate	KPI.
*(9-Octadecenyl)amine, ethoxylated	ARC, ETC, GAF, STC, TCH, X.
*Octadecylamine, ethoxylated	ARC, ETC, TCH, WTC.
3-Octyloxy and 3-decyloxy-propylamine	ARC.
Oleylamine, ethoxylated	GAF, MCB.
Polyalkylene polyamine, ethoxylated	X.
Polyether amine, ethoxylated	RH.
Polyethylenepolyamine, alkoxyated	BAS.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1986

Surface-active agents	Manufacturers' identification codes (according to list in table 38)
Cationic—Continued	
Amine oxides and oxygen-containing amines (except those having amide linkages)—Continued:	
Acyclic—Continued:	
Polyimine, propoxylated	TCH.
1,3-Propanediamine, alkoxyated	SHX.
* (Soybean oil alkyl)amine, ethoxylated	ARC, ENJ, ETC, MCB, SHX, SVC, X.
* (Tallow alkyl)amine, ethoxylated	ARC, BAS, DA(E), DUP, ENJ, ETC, GAF, MCB, S, SHX, SVC, TCH, WTC.
N-(Tallow alkyl)trimethylenediamine, ethoxylated	ARC, ENJ, ETC, SVC, X.
Tallow ethyl alkylamine, ethoxylated, sulfate	ETC, RPC.
N,N,N',N'-Tetrakis(2-hydroxyethyl)ethylenediamine	STC.
N,N,N',N'-Tetrakis(2-hydroxyethyl)ethylenediamine, propoxylated	STC.
N,N,N',N'-Tetrakis(2-hydroxypropyl)ethylene diamine	MZC
N,N,N',N'-Tetrakis(2-hydroxypropyl)ethylenediamine, propoxylated and ethoxylated	ARC, BAS, MZC.
Triethanolamine, ethoxylated	MIL, TCH.
Triethanolamine salicylate	RSA.
All other acyclic amine oxides and oxygen-containing amines (except those with amide linkages)	BAS, BRD, DA(E), SDH.
Cyclic:	
Aniline, ethoxylated	MIL.
2,5-Dimethoxyaniline, ethoxylated	MIL.
2-Heptadecyl-1,4-hydroxymethyl-4-ethyl-2-oxazoline	BRD.
N-Hexadecylmorpholine	BRD.
N-(2-Hydroxyethyl)-1,2-diphenylethylenediamine	MIR.
1-(2-Hydroxyethyl)-2-nonyl-2-imidazoline	BRD, MIR, MOA, MZC.
1-(2-Hydroxyethyl)-2-nor(coconut oil alkyl)-2-imidazoline	BRD, FTX, MOA, TCH.
1-(2-Hydroxyethyl)-2-nor(soya oil alkyl)-2-imidazoline	MIR.
*1-(2-Hydroxyethyl)-2-nor(tall oil alkyl)-2-imidazoline	BRD, HDG, MIR, MOA, X.
1-(2-Hydroxyethyl)-2-(tall oil alkyl)imidazoline, fatty acid salt	X.
Isostearyl imidazoline	MOA.
Lignin amine	WVA.
1-(2-Naphthenic acid amidoethyl)-2-naphthenyl-2-imidazoline	ARC.
Rosin amine, ethoxylated	HPC, X.
m-Toluidine, ethoxylated	MIL.
All other cyclic amine oxides and oxygen-containing amines (except those having amide linkages)	DA(E), X.
Amines and amine oxides having amide linkages:	
Carboxylic acid-diamine and polyamine condensates:	
Acetic acid, amides with polyalkylene polyamines, salt	X.
Caprylic acid tetraethylene-pentamine condensate	ICI.
Mixed fatty acids-polyalkylenepolyamine condensate	JTO, TCH.
Naphthenic acids-polyalkylene polyamine condensate	X.
Naphthenic acids-tall oil fatty acids-polyalkylene polyamine condensate	X.
2-Nor tall oil alkyl-1-tall oil amidoethyl imidazoline	SHX.
Oleic acid-diethylenetriamine condensate	DA(E), LUR.
Oleic acid-N,N-dimethyltrimethylenediamine condensate	CCW.
Pelargonic acid-tetraethylenepentamine condensate	ETC, ICI, STC.

SECTION 12. SURFACE-ACTIVE AGENTS

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1986

Surface-active agents	Manufacturers' identification codes (according to list in table 38)
Cationic—Continued	
Amines and amine oxides having amide linkages—Continued	
Carboxylic acid-diamine and polyamine condensates—Continued	
*Stearic acid-diethylenetriamine condensate	CRT, DA(E), JOR, S, SNW.
Stearic acid-diethylenetriamine condensate, ethyl sulfate	GDC.
Stearic acid, N,N-dimethylamino-propylamine condensate	MOA.
Stearic acid-ethylenediamine condensate	CLD, SOS.
Stearic acid-ethylenediamine condensate, monoethoxylated, ethyl sulfate	GDC.
Stearic acid mixed amine condensate	STC.
Stearic acid-tetraethylenepentamine condensate	ONX(E), X.
Tall oil acids/aminoethylpiperazine condensate	ENJ.
Tall oil acids-diethylenetriamine condensate	FER, WTC, WVA.
Tall oil acids-mixed polyamine condensate	WVA.
*Tall oil acids-polyalkylenepolyamine condensate	QCP, WVA, X.
Tall oil acids-polyalkylenepolyamine condensate salts, with dodecylbenzene sulfonic acid and/or tall oil fatty acids	X.
All other carboxylic acid-diamine and polyamine condensate	DA(E).
Carboxylic acid-diamine and polyamine condensates, alkoxylated:	
Mixed fatty acids-alkylenediamine condensate, polyethoxylate	WTC.
Stearic acid-ethylenediamine condensate, monoethoxylated	DEX, ICI, SLC.
Other amines and amine oxides having amide linkages:	
3-Cocoamido-N,N-dimethylpropylamine oxide	JOR.
Cocoamidopropylidimethylamine oxide	ONX(E), PAT, SBC.
N,N'-(Di-tall oil acid)amidoethylamine	X.
1-(2-Hydrogenated tallow amidoethyl)-2-nor(hydrogenated tallow)-2-imidazoline	SHX.
*3-Lauramido-N,N-dimethylpropylamine oxide	FER, ONX(E), SNW.
Laurylamidopropylidimethyl amine	WM.
Oleamidopropylidimethyl amine	WM.
Palmitylamidopropylidimethyl amine	WM.
Stearamidoethyldiethylamine	S.
Stearamidoethylethanolamine acetate	S.
Stearic acid, diethanolamine condensate, methyl sulfate	DUP.
Stearylamidopropylidimethyl amine	WM.
Amines, not containing oxygen (and salts thereof):	
Amine salts:	
N,N-Dimethyl-N-alkylamine phosphate	X.
(Hydrogenated tallow alkyl)amine acetate	ARC.
(Mixed alkyl)amine phosphate	X.
Octadecylamine acetate	ARC, STC.
(Tallow alkyl)amine acetate	ARC, X.
N-(Tallow alkyl)trimethylenediamine acetate	ARC.
N-(Tallow alkyl)trimethylenediamine oleate	ARC, ENJ.
All other amine salts (not containing oxygen)	DA(E).
Diamines and polyamines:	
Imidazoline derivatives:	
1-(2-Aminoethyl)-2-nor(tall oil alkyl)-2-imidazoline	WTC.
2-Heptadecyl-2-imidazoline	CGY, SCO.
Polyamine/tall oil imidazoline	WTC.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1986

Surface-active agents	Manufacturers' identification codes (according to list in table 38)
Cationic—Continued	
Amines, not containing oxygen (and salts thereof)—Continued	
Diamines and polyamines—Continued	
Imidazoline derivatives—Continued	
Stearamidocethyl-2-heptadecyl imidazoline	ICI.
N-Behenylarachidyl propylene diamine	WTC.
*N-(Coconut oil alkyl)trimethylenediamine	ARC, JTO, SHX.
N-(Dimeracidalkyl)trimethylenediamine	ENO.
Dimer diamine	SHX, WTC.
N-(Docosyl and eicosyl)tarimethylenediamine	ENO.
Jet amine D-20 (tall oil derivatives)	JTO.
N-(Mixed alkyl)polyethylenepolyamine	CCW.
N-(9-Octadecenyl)trimethylenediamine	ARC, JTO, SHX.
N-(Oleic-linoleic)-1-3-propylene diamine	WTC.
Polyalkylene polyamines and salts and quats	X.
1-Propanamine, 3-(C ₁₂ -C ₁₈ alkoxy derivatives)	SHX.
N-(Soybean oil alkyl)trimethylenediamine	ENO.
3-(Tall oil amino)propyl amine	SHX.
*N-(Tallow alkyl)dipropylenetriamine	ARC, JTO, SHX.
N-(Tallow alkyl)trimethylenediamine	ARC, ENJ, JTO.
3-Tetradecylaminopropyl amine	SHX.
All other diamines and polyamines	ARC, X.
Primary monoamines:	
Alkyldimethylamine oxide	STC.
Arachidylbehenylalkyl amine	ENO, WTC.
(Coconut oil alkyl)amine	ARC, ENO, MCB, SHX, WTC.
Dimeracidalkyl amine	ENO, WTC.
Dodecylamine	ARC, SHX.
(Erucyl alkyl)amine	ENO.
Hexadecylamine	ARC, ENO, WTC.
* (Hydrogenated tallow alkyl)amine	ARC, ENJ, ENO, JTO, SHX.
Jetamine primary (hard tallow)amine	JTO.
Jetamine primary cocoamine	JTO.
Jetamine primary oleoamine	JTO.
Jetamine primary soya-amine	JTO.
(Mixed alkyl)amine	SHX.
*9-Octadecenylamine	ARC, ENO, SHX, WTC.
*Octadecylamine	ARC, ENO, SHX, WTC.
(Soybean oil alkyl)amine	ARC, ENO, WTC.
(Tall oil alkyl)amine	ARC.
* (Tallow alkyl)amine	ARC, ENJ, ENO, JTO, SHX, WTC.
Secondary and tertiary monoamines:	
Bis(coconut oil alkyl)amine	ARC.
Bis(hydrogenated tallow alkyl)amine	ARC.
Bis(tallow alkyl)amine	TX.
1-Decanamine, N,N-didodecyl	SHX.
N,N-Dimethyl(behenyl alkyl)amine	ENO.
N,N-Dimethylbehenylarachidylamine	WTC.
N,N-Dimethyl(coconut oil alkyl)amine	AAC, ARC, ENO, PG, WTC.
N,N-Dimethyldodecylamine	ARC, ONX(E), TNA.
N,N-Dimethylhexadecylamine	ARC, ONX(E).
N,N-Dimethyl(hydrogenated tallow alkyl)amine	ARC.
N,N-Dimethyl(mixed alkyl)amine	BRD, ONX(E).
N,N-Dimethyl-9-octadecenylamine	ARC, ENO, WTC.
*N,N-Dimethyloctadecylamine	ARC, ENO, ONX(E), SHX, WTC.
N,N-Dimethyl(soybean oil alkyl)amine	ARC, ENO, JTO, WTC.
N,N-Dimethyl(tallow alkyl)amine	ENO.
N,N-Dimethyltetradecylamine	ARC, BRD.
N-Methylbis(coconut oil alkyl)amine	ARC, SHX.

SECTION 12. SURFACE-ACTIVE AGENTS

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1986

<i>Surface-active agents</i>	<i>Manufacturers' identification codes (according to list in table 38)</i>
Cationic—Continued	
Amines, not containing oxygen (and salts thereof)—Continued	
Secondary and tertiary monoamines—Continued	
N-Methylbis(hydrogenated tallow alkyl)amine	ARC, ENO, SHX.
N-Methylbis(octyl-decyl)amine	ONX(E).
Methyl didecylamine	ONX(E).
*N-Methyldioctadecylamine	ARC, SHX, WTC.
Tri(hydrogenated tallow) amine	SHX.
Trisodecylamine	SCP.
Trilaurylamine	SCP.
Trioctylamine	SCP, SHX.
Tri(tridecyl)amine	SHX.
All other secondary and tertiary monoamines	TNA.
Oxygen-containing quaternary ammonium salts:	
2-(C ₁₅ -C ₁₇ Alkyl)-1-(C ₁₄ -C ₁₆ amidoethyl)(4,5-dihydro-3-methyl)imidazolium methyl sulfate	DOW, SVC.
(2-Aminoethyl)ethyl(hydrogenated tallow alkyl)(2-hydroxyethyl)ammonium ethyl sulfate	LUR.
Benzene-methan ammonium-N,N-dimethyl-N-tetradecylchloride	X.
Benzyl(coconut oil alkyl)bis(2-hydroxyethyl)ammonium chloride	X.
Benzyl(coconut oil amidopropyl)dimethylammonium chloride	X.
1-Benzyl-1-(2-hydroxyethyl)-2-nor(tall oil alkyl)-2-imidazoline	X.
Benzyl(polyoxyethylene-cocoamine)ammonium chloride with benzyl (polyoxyethylene, tallow amine) ammonium chloride	S.
Benzyl(polyoxyethylene, octadecylamine) ammonium chloride with benzyl(polyoxyethylene, tallow amine) ammonium chloride	S.
Benzyl(tallow alkyl)bis(2-hydroxyethyl)ammonium chloride	DUP.
Bis(N-amidopropyl, N,N-dimethyl, N-benzylammonium chloride)	SBC
Bis(N-amidopropyl)-N,N-dimethyl-N-ethylammonium ethyl sulfate, dimer acid	SBC.
Bis(N,N'-ethyl(stearic/arachidic/behenic)amide)-cyanoethyl ethylammonium ethosulfate	PCI.
Bis(2-hydroxyethyl, ethoxylated)-methyl-(9-octadecenyl)-ammonium chloride	ARC.
Bis(2-hydroxyethyl, ethoxylated)-methyloctadecylammonium chloride	ARC.
Bis-2-hydroxyethyl-(hydrogenated tallow)-ethyl sulfate	ICI.
Bis(2-hydroxyethyl)methyl soya ammonium chloride	SVC.
Bis(2-hydroxyethyl)-methyl-(tallow alkyl)ammonium chloride	ARC, MZC.
Bis-2-hydroxyethyl-octyl-methyl-p-toluene sulfonate	HXL.
1,3-Bis(stearyl)dimethylammonium chloride)-2-propanol	JOR.
Cocoamide diethanolamine-amine, lauryl sulfate	MOA.
(Coconut oil alkyl)amine, ethoxylated, diethosulfate	ETC.
(Coconut oil alkyl)-bis-(2-hydroxyethyl, ethoxylated)-methylammonium chloride	ARC, ENJ, GAF, JTO, SHX.
Coconut oil fatty acid polyoxyethylene	S.
Dimethyldodecylethylammonium ether sulfate	PCI.
Distearyldimethylammonium methosulfate	HXL.
Ethanaminium, 2-hydroxy-N,N-bis(2-hydroxyethyl)-N-methyl-, salt with silicic acid	TCH.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1986

<i>Surface-active agents</i>	<i>Manufacturers' identification codes (according to list in table 36)</i>
Cationic—Continued	
Oxygen-containing quaternary ammonium salts—Continued	
Ethoxylated(hydrogenated tallow amine), methyl ammonium chloride	ENJ.
Ethoxylated, quaternized(C ₁₂ -C ₁₈ alkyl)-oxypropyl-trimethylene diamine	ENJ.
Ethoxylated, quaternized reaction product of formaldehyde and tallow diamine	ENJ.
Ethoxylated tallow amine, potassium propionate derivative	SVC.
Ethoxylated tallow amine propionate, methyl sulfate, potassium salt	SVC.
N-Ethyl-N,N-bis(polyoxyethylene)tallow ammonium ethyl sulfate	SHX.
1-Ethyl-2-(8-heptadecenyl)-1-(2-hydroxyethyl)-2-imidazolinium ethyl sulfate	ICI, SHX.
N-Ethyl-N-hexadecylmorpholinium ethyl sulfate	BRD, ICI.
1-Ethyl-2-isoheptadecyl-1-(2-hydroxyethyl)-2-imidazolinium ethyl sulfate	SBC.
Ethyl(polyoxyethylene, cocoamine)ethylsulfate	S.
N-Ethyl-N-(soybean oil alkyl)morpholinium ethyl sulfate	ICI.
α-Glyconamidopropyl dimethyl-2-hydroxyethyl ammonium chloride	VND.
(Hydrogenated tallow alkyl)amine, ethoxylated, diethosulfate	ETC.
(2-Hydroxyethyl)dimethyl(3-stearamidopropyl)-ammonium dihydrogen phosphate	ACY.
(2-Hydroxyethyl)dimethyl(3-stearamidopropyl)-ammonium nitrate	ACY.
Hydroxyethyl-2-undecyl-2,3-imidazoline	MOA.
Hydroxypropylammonium acetate	X.
N-2-Hydroxypropyl-N-methyl-N,N-bis(tallow amido ethyl)-ammonium ethyl sulfate	SHX.
Imidazolinium, 1-(carboxymethyl)-4,5-dihydro-1-(hydroxyethyl)-2-nor(cocoalkyl), hydroxide, monosodium salts	SHX.
Imidazolinium, 1-(carboxymethyl)-2-heptyl-1-(2-hydroxyethyl), hydroxide, sodium salt	SHX.
Isostearamidopropyldimethylamino glycolate	SBC.
Isostearylamidopropyldimethylethylammonium ethyl sulfate	JOR.
(3-Lauramidopropyl)trimethylammonium methyl sulfate ..	ACY.
Methyl, bis-(2-hydroxyethyl)hydrogenated tallow alkylammonium chloride	ENJ.
Methyl, bis-(2-hydroxyethyl)isodecyloxypropyl-ammonium chloride	ENJ.
Methyl, bis-(2-hydroxyethyl)isotridecyloxypropyl-ammonium chloride	ENJ.
Methyl, bis-(2-hydroxyethyl)-(soya alkyl) ammonium chloride	ENJ.
Methyldioleylethoxyammonium methyl sulfate	SHX.
Methylditallowimidazolinium methosulfate	SVC.
1-Methyl-2-(8-heptadecenyl)-1-(9-octadecenyl)amido ethyl	SHX.
1-Methyl-2-nor-tallow-1-2-tallow amidoethyl-imidazolinium methyl sulfate	SHX.

SECTION 12. SURFACE-ACTIVE AGENTS

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1986

<i>Surface-active agents</i>	<i>Manufacturers' identification codes (according to list in table 38)</i>
Cationic—Continued	
Oxygen-containing quaternary ammonium salts—Continued	
N-Methyl-N-polyoxyethylene-N,N-bis(hydrogenated tallow amidoethyl)ammonium	SHX.
N-Methyl-N-polyoxyethylene-N,N-bis(tallow amidoethyl)	SHX.
Methyltallowdiethylenetriamine condensate, polyethoxylated, methyl sulfate	SVC.
Methyltallowdiethylenetriamine condensate, polypropoxylated, methyl sulfate	SVC.
Mixed alkyl imidazoline derivative, ethoxylated	MOA.
Mixed (coco and soya fatty acids), reaction products with chloromethane and diethylenetriamine, ethoxylated, quaternized	ENJ.
Mixed fatty acid amide with diethylene triamine/ ethyl sulfate	EFH.
Polyethoxymethylstearyl ammonium chloride	WTC.
Polyethylenimine methyl ammonium sulfate	STC.
Polypropoxydiethylmethyl ammonium chloride	WTC.
1-Propanaminium, N-ethyl-N,N-dimethyl-3-(1-oxooctadecyl)amino-, ethyl sulfate	SBC.
Soya fatty acids, reaction products with chloromethane and diethylenetriamine, ethoxylated, quaternized	ENJ.
Soya fatty acids, reaction products with chloromethane and diethylenetriamine, propoxylated, quaternized	ENJ.
Stearamidopropyltrimethylammonium tosylate and propylene glycol	VND.
Stearylamidopropyltrimethylmyristyl acetate ammonium chloride	VND.
Stearyltrimethylammoniummethosulfate quaternary (Tallow alkyl)amine, ethoxylated, diethosulfate	SVC.
Tallow amine, ethoxylated, quaternary ammonium salt ..	ETC.
Trimethyl-p-methylbenzylammonium chloride	DUP, VND.
Trimethyl-p-methylbenzylammonium chloride	PCI.
All other oxygen-containing quaternary ammonium salts (except those having amide linkages)	DA(E), JTO, SHX, X, X.
All other oxygen containing quaternary ammonium salts ..	BRD.
Quaternary ammonium salts, not containing oxygen:	
Acyclic:	
Bis-(behenyl-dimethyl)ammonium chloride	WTC.
*Bis(coconut oil alkyl)dimethylammonium chloride	ARC, ENJ, JTO, ONX(E), SHX, SVC.
Bis(coconut oil alkyl)dimethylammonium nitrate	ARC.
*Bis(hydrogenated tallow alkyl)dimethylammonium chloride	ARC, ENO, ONX(E), SHX, WTC.
Bis(hydrogenated tallow alkyl)dimethylammonium methyl sulfate	ARC, ONX(E), SHX.
Bis(tallow alkyl)dimethyl ammonium chloride	SHX.
Cocodimethylethylammonium ethyl sulfate	SHX.
N-(Coconut oil alkyl)aminobutyric acid, sodium salt	BRD, JTO, ONX(E), SHX.
Didecyldimethylammonium chloride	ARC, HNT, ONX(E).
Dilauryldimethylammonium chloride	HXL.
Dimethyldi(C ₁₂ -C ₁₃) ammonium chloride (mixed straight and branched chains)	SHX.
Dimethyldiarachidylbehenylammonium chloride	ENO.
Dimethyldioctadecylammonium chloride	ARC, SHX.
Dimethyldioctadecylammonium methyl sulfate	ARC, SHX.
Dimethyl(soya alkyl)ammonium ethyl sulfate	SVC.
N,N-Dioctyl-N,N-dimethylammonium chloride	BRD, HNT.
Di-tallow-amidoammonium sulfate	CRD.
Dodecyltrimethylammonium chloride	ARC, SHX.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1986

Surface-active agents	Manufacturers' identification codes (according to list in table 38)
Cationic—Continued	
Quaternary ammonium salts, not containing oxygen—Cont.	
Acyclic—Continued	
Ethoxylated methyl chloride reaction products of formaldehyde and tallow diamine	SVC.
Ethylidimethyl(mixed alkyl) ammonium ethyl sulfate	DEX, JOR.
Ethylhexadecyldimethylammonium bromide	HXL.
Hexadecyltrimethylammonium bromide	HXL.
Hexadecyltrimethylammonium chloride	ARC, BRD, SHX.
Hexane-1,6-bis(tributylammonium bromide)	HXL
(Hydrogenated tallow alkyl)trimethylammonium chloride	SHX.
Hydroxypropylammonium cyanoacetate	X.
Lauryl pyridinium chloride	WTC.
Methyl-1-tallow-amidoethyl-2-tallow-imidazolium-methyl sulfate	CRD.
Methyltri(C ₈ -C ₁₀) ammonium chloride	SHX.
Methyl(tri-hydrogenated tallow alkyl) ammonium chloride	WTC.
Methyltrioctylammonium chloride	BRD, SCP.
(Mixed alkyl) ammonium chloride	MIL.
Mixed linear alkylidimethylammonium methyl sulfate	STC.
(Mixed linear alkyl)trimethylammonium bromide	DUP.
Mixture of N-octyl, N-decyl, N,N-dimethyl ammonium chloride and benzyl, dimethyl, (mixed alkyl) ammonium chloride	BRD.
Octyl-decyl-dimethyl ammonium chloride	HNT.
N-Octyl, N-decyl, N,N-dimethyl ammonium chloride ...	BRD.
*N,N,N',N',N'-Pentamethyl-N-(tallow alkyl)-trimethylene-bis(ammonium chloride)	ARC, JTO, SHX.
(Stearic acid)-ethylenediamine methylammonium sulfate	STC.
Stearyl pyridinium chloride	WTC.
Tetrabutylammonium bromide	HXL.
1-Tetradecanaminium, N,N,N-trimethyl-chloride	SHX.
Tetraethylammonium bromide	EK.
Tetraethylammonium chloride	EK.
Tetraheptylammonium bromide	EK.
Tetramethylammonium bromide	RSA.
Tetramethylammonium chloride	RSA.
Tributylmethylammonium chloride	TNA.
Trihydrogenated tallow ammonium chloride	ENO.
Trimethyldodecylammonium chloride	ONX(E).
Trimethyloctadecylammonium chloride	ARC, SHX.
Trimethyl(soybean oil alkyl) ammonium chloride	ARC, JTO, SHX.
*Trimethyl(tallow alkyl) ammonium chloride	ARC, ENO, JTO, SHX, WTC.
All other acyclic quaternary ammonium salts, not containing oxygen	DA(E), X.
Benzenoid:	
β-Alanine-N-(2-hydroxyethyl)-N-(2(1-oxococoyl)-amino)ethyl, sodium salt	SHX.
Benzyl(alkylpyridinium) chloride	X.
*Benzyl(coconut oil alkyl)dimethylammonium chloride ..	ENO, GDC, HRT, ONX(E), SHX, TCC, WTC, X.
Benzyl-di(hydrogenated tallow alkyl)-methylammonium chloride	ARC.
Benzylidimethyl(hydrogenated tallow alkyl) ammonium chloride	WTC.
*Benzylidimethyl(mixed alkyl) ammonium chloride	AAC, BKM, BRD, CRD, HNT, JOR, ONX(E), PCI, SDM, SHX, X.

SECTION 12. SURFACE-ACTIVE AGENTS

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1986

Surface-active agents	Manufacturers' identification codes (according to list in table 38)
Cationic—Continued	
Quaternary ammonium salts, not containing oxygen—Continued	
Benzenoid —Continued	
Benzylidimethyloctadecylammonium chloride	JOR.
Benzylidimethyloctadecylammonium chloride	JOR, ONX(E), SHX, TNI.
Benzylidimethyloleylammonium chloride	BOE.
Benzylidimethyl(tallow alkyl)ammonium chloride	BOE, ENO, WTC.
Benzylidimethyltetradecylammonium chloride	BRD, SBC.
Benzylododecyltrimethylammonium chloride	ONX(E).
Benzylhexadecyldimethylammonium chloride	BKM, ONX(E).
Benzyl(hydrogenated tallow alkyl)dimethylammonium chloride	ARC, ENO, SHX.
Benzyl-methyl-bis(hydrogenated tallow)ammonium chloride	ENO, WTC.
*Benzylpicolinium chloride	GDC, LUR, S.
Benzyl(mixed alkyl)pyridinium	X.
1-Benzylpyridinium chloride	BRD, PCI.
*Benzyltrimethylammonium chloride	CRT, HIP, PCI, RSA, SHX, TCC, UTC.
Butylpicolinium bromide	HXL.
2,4-Dichlorobenzylidimethyl(mixed alkyl)ammonium chloride	X.
(3,4-Dichlorobenzyl)dodecyldimethylammonium chloride	ONX(E).
1-Dodecylpyridinium chloride	CCL, DAN.
(Ethylbenzyl)dimethyl(mixed alkyl)ammonium chloride	HNT, ONX(E).
(Mixed alkyl)dibenzyltrimethyl-1,3-propane diammonium chloride	GDC.
α -Naphthyl-dodecyl-dimethylammonium chloride	ONX(E).
1-Phenethyl-2-picolinium bromide	HXL.
Phenethylpyridinium bromide	HXL.
All other benzenoid quaternary ammonium salts not containing oxygen	ICI, X.
All other cationic surface-active agents	BRD, BRI, DUP, MIR, MOA, RPC, SCP, WM, WTC.
Nonionic	
Carboxylic acid amides:	
Diethanolamine condensates (amine/acid ratio = 2/1):	
Avocado amide and avocado oil	MOA.
Capric acid (Ratio = 2/1)	SCP, TCH.
Castor oil acids (Ratio = 2/1)	CAS(E), CLI(E), NSC.
*Coconut oil acids (Ratio = 2/1)	ARD, BRO, CCC, CCL, CLI(E), CON, CTL, CYL, DA(E), ECC, EFH, FTX, GDC, HNT, HRT, HTN(E), JOR, LEA, LUR, MCP, MOA, MRV, MZC, ONX(E), PNX, RPC, SBC, SCP, SHX, SOP, STP, TCH, WTC, X.
*Coconut oil and tallow acids (Ratio = 2/1)	BRD, CRT, CTL, ESS, JOR, MOA, SBC, UNN.
Lard oil acids	FER.
Lauric acid (Ratio = 2/1)	CRD, MOA, MZC.
*Lauric and myristic acids (Ratio = 2/1)	CRD, JOR, MOA, MZC, SBC, STP.
Linoleic acid (Ratio = 2/1)	MOA.
Mixed carboxylic acids	SOS, WTC.
Mixed fatty acids neutralized	CPC.
*Oleic acid (Ratio = 2/1)	CLI(E), CTL, EFH, EMR, MOA, MZC, SBC, STP.
Palmitic and stearic acids (Ratio = 2/1)	RPC.
Pelargonic acid (Ratio = 2/1)	TCH.
Soybean oil acids (Ratio = 2/1)	MZC.
Stearic acid (Ratio = 2/1)	CLI(E), EFH, WVA.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1986

<i>Surface-active agents</i>	<i>Manufacturers' identification codes (according to list in table 38)</i>
Nonionic—Continued	
Carboxylic acid amides—Continued	
Diethanolamine condensates (amine/acid ratio = 2/1)—Continued	
*Tall oil acids (Ratio = 2/1)	BRI, ECC, MOA, MZC, PNX, SBC, STC, WVA.
Tallow acids (Ratio = 2/1)	CLI(E), EFH, ICI, MOA.
Diethanolamine condensates (other amine/acid ratios):	
Capric acid (Ratio = 1/1)	MOA.
Coconut acids, modified	ETC.
*Coconut oil acids (Ratio = 1/1)	BRD, CLI(E), CTL, DA(E), EMK(E), ETC, HNT, HRT, HTN(E), JOR, JRG, MIR, MOA, MZC, ONX(E), PIL, S, SBC, SCP, SHX, STP, TCC, WTC, X.
*Lauric acid (Ratio = 1/1)	CLI(E), CYL, MOA, ONX(E), SBC, TCH, TNI, WTC.
*Lauric and myristic acid (Ratio = 1/1)	BRD, CLI(E), CYL, HTN(E), MOA, SBC.
*Linoleic acid (Ratio = 1/1)	CLI(E), JOR, MOA, SBC, VND.
Mixed carboxylic acids (Ratio = 1/1)	SOS, WTC.
Mixed fatty acids (Ratio = 1/1)	WTC.
Mixed vegetable acids (Ratio = 1/1)	FTX.
Myristic acid (Ratio = 1/1)	MOA.
Oleic acid (Ratio = 1/1)	DA(E).
Palmitic and stearic acids (Ratio = 1/1)	BRD, BRI.
*Soybean oil acids (Ratio = 1/1)	MOA, MZC, SBC.
*Stearic acid (Ratio = 1/1)	CHP, ECC, ENJ, HIP, MRV.
Tall oil acids (Ratio = 1/1)	CHP, WTC, WVA.
Tallow acids (Ratio = 1/1)	MOA, VPC.
Other diethanolamine condensates	BRD, DA(E).
All other carboxylic acid amides:	
Cocoaminoamide	DA.
Coconut oil acids	STP.
*Coconut oil acids (Ratio = 1/1)	FTX, JOR, MOA, PG, SCP, SOS, VND.
*Coconut oil acids (Ratio = 2/1)	ARD, MOA, STP, VND.
Coconut oil acids	DA(E), MOA, PAT.
Coconut oil acids-dimethylaminopropylamine condensate (Ratio = 1/1)	JRG.
Coconut oil acids-ethanolamine condensate, ethoxylated	BRD, STP.
Coconut and soybean oil acids	ARD.
Diethanolamine-stearic acid (Ratio = 1/2)	VND.
Dimethylethanolamine-stearic acid (Ratio = 1/1)	VND.
Dioleic acid (Ratio = 1/2)	CLD.
Fatty acid alkenolamide	MCB.
Glycol amide stearate (Ratio=1/1)	VND.
Hydrogenated tallow acids (Ratio = 2/1)	ARC.
Hydrogenated tallow acids, aminoethylethanolamide, acetate salt	PCI.
Hydrogenated tallow amides, ethoxylated	SVC.
Hydrogenated tallow glycerides diethylenetriamine condensate	HRT.
Isonanoic acid mono and triethanolamine salt	STC.
Isostearic acid, aminoethylethanolamide, acetate salt	PCI.
Lauric acid	CLI(E), HTN(E), MOA.
Lauric acid-ethanolamine condensate, ethoxylated	MZC.
Lauric and myristic acids	DA(E).
Lauric and myristic acids (Ratio = 1/1)	MOA.
Mink amidopropy dimethyl amine (Ratio = 1/1)	VND.
Mixed fatty acids, diethanolamine condensate	WTC.
Myristic acid	CRN.
Oleic acid aminoethylethanolamine-condensate (Ratio = 1/1), ethyl sulfate	RPC.

SECTION 12. SURFACE-ACTIVE AGENTS

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1986

<i>Surface-active agents</i>	<i>Manufacturers' identification codes (according to list in table 38)</i>
Nonionic—Continued	
Carboxylic acid amines—Continued	
All other carboxylic acid amides—Continued	
Oleic acid-ethanolamine condensate, ethoxylated	ONX(E), SHX.
Stearic acid (Ratio = 1/1)	MOA, VND.
Stearic acid (Ratio = 2/1)	CLI(E), ECC.
Stearic acid aminoethanolamine (Ratio = 1.0/1.65)	CHP.
Stearic acid-aminoethylethanolamine (Ratio = 1.75/1.0)	SBC.
Stearic acid-N-aminoethylethanolamine condensate	BOE.
Stearic acid diethanolamine (Ratio = 1.0/11.6)	CHP.
Stearic acid-ethylenediamine condensate (Ratio = 1/2)	TCH.
Stearic acid monoethanolamine condensate	WTC.
Tall oil acids-ethylenediamine condensate (Ratio = 1/2)	SCP.
Tall oil fatty acid, diethylene triamine condensate (Ratio = 1/2)	STC.
Tall oil fatty acids (Ratio = 1/2)	EFH.
Tall oil fatty acids (Ratio = 2.7/1)	EFH.
Tall oil fatty acids (Ratio = 1.5/1)	EFH.
Tall oil fatty acids-triethanolamine condensate	X.
Tallow acids (Ratio = 1.00/1.65)	PAT.
Tallow alkyl amide, ethoxylated	MCB.
Tallow, N-3-(dimethylamino)propyl (Ratio = 1/3)	PAT.
Tallow fatty acids, ethanolamine condensate, ethoxylated	GAF.
All other carboxylic acid amides	ARC, BKM, CGY, DA(E), GAF, ONX(E), ROB.
Carboxylic acid esters:	
Anhydrosorbitol esters:	
Anhydrosorbitol dioleate	ICI.
Anhydrosorbitol monoester of tall oil acids	MZC.
*Anhydrosorbitol monolaurate	BRD, GAF, GLY, HDG, ICI, MZC, TCH.
*Anhydrosorbitol mono-oleate	BRD, GAF, GLY, HDG, ICI, MZC, TCH.
Anhydrosorbitol monopalmitate	ICI, TCH.
*Anhydrosorbitol monostearate	BRD, GAF, GLY, HDG, ICI, MZC, TCH.
Anhydrosorbitol sesquileate	GLY, TCH.
Anhydrosorbitol sesquisteate	TCH.
*Anhydrosorbitol trioleate	BRD, GLY, HDG, ICI, MZC, TCH.
Anhydrosorbitol tristearate	GLY.
Diethylene glycol esters:	
Diethylene glycol dioleate	DOW.
Diethylene glycol distearate	GLY.
Diethylene glycol monoester of coconut oil acids	CLD.
Diethylene glycol monoester of tall oil acids	BKM.
*Diethylene glycol monolaurate	ECC, HDG, MZC.
Diethylene glycol mono-oleate	CTL.
*Diethylene glycol monostearate	CLI(E), ECC, HDG, STP, VND.
Diethylene glycol sesquilester of tall oil acids	ECC.
Diethylene glycol sesquilester	GLY.
Diethylene glycol terephthalate	UPF.
All other diethylene glycol esters	DA(E).
Ethoxylated anhydrosorbitol esters:	
*Ethoxylated anhydrosorbitol monolaurate	BRD, ETC, GAF, HDG, ICI, MZC, TCH.
*Ethoxylated anhydrosorbitol mono-oleate	BRD, ETC, GLY, HDG, ICI, MCB, MZC, SVC, TCH.
Ethoxylated anhydrosorbitol monopalmitate	ICI.
*Ethoxylated anhydrosorbitol monostearate	ETC, GLY, HDG, ICI, MZC, SVC, TCH.
Ethoxylated anhydrosorbitol monotallate	TCH.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1986

<i>Surface-active agents</i>	<i>Manufacturers' identification codes (according to list in table 38)</i>
Nonionic—Continued	
Carboxylic acid esters—Continued	
Ethoxylated anhydrosorbitol esters—Continued	
Ethoxylated anhydrosorbitol triester of tall oil acids	GAF, GLY, ICI.
*Ethoxylated anhydrosorbitol trioleate	BRD, ETC, HDG, ICI, MZC, TCH.
*Ethoxylated anhydrosorbitol tristearate	GLY, ICI, MZC.
Ethoxylated sorbitol esters:	
Ethoxylated sorbitol beeswax ester	ICI.
Ethoxylated sorbitol hexaester of tall oil acids	TCH.
Ethoxylated sorbitol hexaoleate	ICI, MZC, TCH.
Ethoxylated sorbitol lanolin ester	ICI.
Ethoxylated sorbitol mono-oleate	ICI.
Ethoxylated sorbitol oleate, acetylated	ICI.
Ethoxylated sorbitol pentalaurate	ICI, MZC.
Ethoxylated sorbitol tetraester of lauric and oleic acids	ICI.
Ethoxylated sorbitol tetracleate	ICI.
Ethoxylated sorbitol tetrastearate	ICI.
All other ethoxylated sorbitol esters	X.
Ethylene glycol esters:	
*Ethylene glycol distearate	CLI(E), EMR, ICI, MZC, STP, WM, WTC.
Ethylene glycol mono-oleate	EFH, TCH.
*Ethylene glycol monostearate	CLI(E), CYL, GLY, HDG, MZC, STP, TCH, VND, WM, WTC.
Glycerol esters:	
Complex glycerol esters:	
Glycerol diacetylitartrate monostearate	EKT.
Glycerol ester ethoxylates	GLY.
Glycerol mono- and diesters of mixed fatty acids	ICI.
Glycerol monoester of hydrogenated tallow fatty acid	PCI.
Glycerol monoester of mixed fatty acids, acetylated	EKT.
Glycerol monoester of mixed fatty acids, succinylated	EKT.
Glycerol mono-oleate, ethoxylated	SCP.
Glycerol esters of chemically defined acids:	
Glycerol dilaurate	VND.
Glycerol dioleate	GLY, STP, WTC.
Glycerol monolaurate	GLY.
*Glycerol mono-oleate	EFH, EMR, GLY, HAL, HDG, MZC, STP, SVC, TCH, WTC.
*Glycerol monoricinoleate	CAS(E), GLY, MZC.
*Glycerol monostearate	CCC, CHL, CLD, CRT, CYL, EMR, GLY, HAL, HDG, HRT, LUR, MCB, MZC, SNW, SOS, STP, TCH, VND, WM, WTC, X.
Glycerol trioctanoate/decanoate	WM.
All other glycerol esters of chemically defined acids	DA(E).
Glycerol esters of mixed acids	
Glycerol diester of coconut oil acids	WM.
Glycerol mixed ester of soybean oil-trimethylolpropane	ENP.
Glycerol mono/diesters of coconut oil acids, ethoxylated	ETC.
Glycerol mono/diesters of coconut oil acids, ethoxylated and propoxylated	ETC.

SECTION 12. SURFACE-ACTIVE AGENTS

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1986

<i>Surface-active agents</i>	<i>Manufacturers' identification codes (according to list in table 38)</i>
Nonionic—Continued	
Carboxylic acid esters—Continued	
Glycerol esters—Continued	
Glycerol esters of mixed acids—Continued	
Glycerol mono-, di-, and triesters of hydrogenated tallow acids	WPG.
Glycerol monoester of C ₈ -C ₁₀ acids	SVC.
Glycerol monoester of coconut oil acids	GLY.
Glycerol monoester of cottonseed oil acids	EKT.
Glycerol monoester of hydrogenated cottonseed oil acids	EKT, WM.
Glycerol monoester of hydrogenated lard acids	EKT.
Glycerol monoester of hydrogenated soybean oil acids	BFP, EKT.
Glycerol monoester of hydrogenated tallow acids	TCH.
Glycerol monoester of lard acids	EKT.
Glycerol monoester of mixed fatty acids	SVC.
Glycerol monoester of palm oil acids	EKT.
Glycerol monoester of safflower oil acids	EKT.
Glycerol monoester of tall oil acids	EFH, FER.
Glycerol monoester of tallow acids	CPC, EKT.
Glycerol sesquiester of tall oil acids	SLM(E).
Glycerol triester of mixed fatty acids	SVC.
Mixed ester of resin and rosin acids	WVA.
All other glycerol esters of mixed acids	BFP, DA(E).
Natural fats and oils, ethoxylated:	
Carnauba wax, ethoxylated	SHX.
*Castor oil, ethoxylated	CAS(E), DA(E), ETC, GAF, GLY, HTN(E), ICI, MCB, MIL, S, STC, SVC, TCH, TMH, X.
Coconut oil, ethoxylated	STC.
*Hydrogenated castor oil, ethoxylated	CAS(E), DA(E), ETC, GAF, ICI, MCB, MIL, STC, TCH.
*Lanolin, ethoxylated	AAC, CRD, CRN, HDG, STC, TCH, X.
Oleic acid, ethoxylated	MIL.
Soybean oil, ethoxylated	DA(E).
Stearic acid, ethoxylated	GAF.
Tall oil acids, ethoxylated	STC.
Tall oil acids, ethoxylated and propoxylated	SVC, X.
Tall oil, refined, ethoxylated	TCH, X.
Tallow fatty acids, ethoxylated	GAF, MCB.
Polyethylene glycol esters:	
Polyethylene glycol esters of chemically-defined acids:	
*Polyethylene glycol dilaurate	EFH, ETC, GLY, HDG, MZC, STP, TCH.
*Polyethylene glycol dioleate	CLD, DA(E), EFH, ETC, GLY, HAL, MIL, SOS, STP, TCH.
*Polyethylene glycol distearate	CHP, GLY, MZC, SBC, STP, TCH.
Polyethylene glycol hydroxyacetate	CCA.
Polyethylene glycol monocaprylate	ECC.
*Polyethylene glycol monolaurate	CCA, CGY, ECC, EFH, ETC, GLY, HAL, ICI, MZC, STP, TCH.
Polyethylene glycol mono-monomerate	ETC.
*Polyethylene glycol mono-oleate	ARC, BOE, CCA, CLD, CRT, DA(E), ECC, EFH, ETC, GAF, GDC, GLY, HAL, HDG, MRT, MRV, MZC, ONX(E), SHX, STC, STP, SVC, TCH, WTC.
Polyethylene glycol mono-oleate, ethoxylated	ICI.
Polyethylene glycol monopalmitate	ETC, GLY, ICI, STC.
Polyethylene glycol monopelargonate, methoxylated	TCH.
Polyethylene glycol monopelargonate	ETC, SOS, TCH.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1986

<i>Surface-active agents</i>	<i>Manufacturers' identification codes (according to list in table 38)</i>
Nonionic—Continued	
Carboxylic acid esters—Continued	
Polyethylene glycol esters—Continued	
Polyethylene glycol esters of chemically-defined acids—Continued	
*Polyethylene glycol monoricinoleate	ECC, ETC, S.
*Polyethylene glycol monostearate	ARC, CCC, CPC, CRT, CYL, DA(E), DEX, EFH, .. ETC, GAF, GDC, GLY, HDG, HRT, ICI, MCP, MZC, SLC, SOS, STP, SVC, TCH, VND.
Polyethylene glycol monotalate	ETC.
*Polyethylene glycol sesquinoleate	ETC, SOS, TCH.
Polyethylene glycol terephthalate	BOC, PCI.
All other polyethylene glycol esters of chemically-defined acids	BAS.
Polyethylene glycol esters of mixed acids:	
Polyethylene glycol diester of coconut oil acids	WM.
Polyethylene glycol diester of coconut oil and oleic acids	EFH.
Polyethylene glycol diester of mixed linear acid/oleic acid	PCI.
*Polyethylene glycol diester of tall oil acids	BRD, CCC, EFH, ETC, MZC, X.
Polyethylene glycol ester of mixed fatty acids	SHX, SOS.
Polyethylene glycol monoester of coconut oil acids	ICI, WM.
Polyethylene glycol monoester of mixed oleic/pelargonic acids	ETC.
Polyethylene glycol monoester of soybean oil acids	GLY.
*Polyethylene glycol monoester of tall oil acids	ARC, BKM, CCC, EFH, FER, MZC.
Polyethylene glycol (mixed ester) of tall oil acids	DA(E).
Polyethylene glycol sesquilester of castor oil acids	DA(E).
Polyethylene glycol sesquilester of coconut oil acids	DA(E), JOR, LUR, MRT, PAT, SOS.
*Polyethylene glycol sesquilester of tall oil acids	ICI, IUR, SLM(E), WTC.
Polyethylene glycol sesquilester of tallow acids	PAT, RPC, SHX, TCH.
Polyglycerol esters:	
Mixed oleic, lauric, stearic, and palmitic hexaglycerol esters	SVC.
Polyglycerol decaoleate	TCH, GLY.
Polyglycerol distearate	GLY, MZC.
*Polyglycerol mono-oleate	HDG, MZC, WTC.
Polyglycerol monostearate	SVC.
Propanediol esters:	
1,2-Propanediol dioctanoate/decanoate	WM.
1,2-Propanediol dipelargonate	WM.
1,2-Propanediol di-2-ethylhexanoate	WM.
1,2-Propanediol monoester of coconut oil acids	WM.
1,2-Propanediol monolaurate	SBC.
1,2-Propanediol mono-oleate	EFH, TCH.
*1,2-Propanediol monostearate	EKT, GLY, HAL, MZC, SBC, TCH, WM.
All other propanediol esters	DA(E).
Other carboxylic acid esters:	
Benzocaine, propoxylated	CRN.
Butyl myristate	CRN.
Caprylic amphopropionate	MOA.
Di-isobutylene maleate	RH.
Ethoxylated 1,3-butylene glycol stearate	STC

SECTION 12. SURFACE-ACTIVE AGENTS

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1986

<i>Surface-active agents</i>	<i>Manufacturers' identification codes (according to list in table 38)</i>
Nonionic—Continued	
Carboxylic acid esters—Continued	
Other carboxylic acid esters Continued:	
Ethoxylated castor oil, ditridecylmaleate	UPF.
Ethoxylated glycerol mono- and diesters of hydrogenated tallow acids	SVC.
Ethoxylated glycerol and propylene glycol esters of coco fatty acids	SVC.
Ethoxylated nonylphenol esters of coconut oil acids	JOR.
Ethoxylated nonylphenol laurate	TCC.
Ethoxylated 1,2-propanediol monostearate	ICI.
Ethoxylated and propoxylated glycerol mono- and diesters of tallow acids	SVC.
Isopropyl myristate	CRN.
Isopropyl palmitate	CRN.
Linoleic acid dimers, alkoxylated	X.
Maleic anhydride, polypropylene glycol copolymer	PCI.
Methylglucoside dioleate	CRN.
Methylglucoside, ethoxylated	CRN.
Methylglucoside laurate	HDG.
Methylglucoside, propoxylated	CRN.
Methylglucoside sesquistearate	CRN.
Mixed alkyl stearate	SOS.
Mixed di- and triethylene glycol monoester of tall oil acids	WVA.
Nonylphenol ethoxylate, oleate	EFH.
Pentaerythritol stearate	SCP.
Polyalkylene glycol oleate	SOS.
Polycarboxylic acid, alkylate	X.
Polycarboxylic acid, alkylphenoxyalkoxylate	X.
Polypropylene glycol dioleate	CLD, ETC.
Polypropylene glycol mono-oleate	CLD.
Propylene glycol esters of hydrogenated palm oil	PG, VND.
All other carboxylic acid esters	CHP, CRN, DA(E), EMR, HDG, MCB, ROB, SYL, X.
Ethers:	
Benzenoid ethers:	
Bisphenol A, ethoxylated	ETC.
2-Butanol, ethoxylated and propoxylated	GAF, X.
C ₂₀ alcohol and hydrocarbons, ethoxylated	GAF.
*Dinonylphenol, ethoxylated	CPC, DA(E), ETC, GAF, HTN(E), MCB, MZC, RH, S, TCH, TMH, X.
*Dodecylphenol, ethoxylated	DA(E), GAF, MCB, MON, TCH, TMH.
Epichlorohydrin bisphenol A, ethoxylated	X.
Furfuryl alcohol, ethoxylated	SVC.
Iso-octylphenol, ethoxylated	AAC, BAS, GAF, MCB, MZC, RH, TMH.
(Mixed alkyl)phenol, alkoxylated	X.
(Mixed alkyl)phenol epichlorohydrin-formaldehyde, alkoxylated	X.
(Mixed alkyl)phenol, ethoxylated	MIL, NTL.
(Mixed alkyl)phenol-formaldehyde, alkoxylated	ETC, GAF, MCB, STC, WTC, X.
(Mixed alkyl)phenol-formaldehyde, methoxylated	STC.
Mixed p-tert-butylphenol-formaldehyde terpolymer	X.
Naphthalenesulfonic acid, polymer with formaldehyde and 4,4'-dihydroxydiphenyl sulfone	PCI.
Naphthalenesulfonic acid, polymer with formaldehyde and 4,4'-dihydroxydiphenyl sulfone, ammonium salt ..	PCI.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1986

<i>Surface-active agents</i>	<i>Manufacturers' identification codes (according to list in table 38)</i>
Nonionic—Continued	
Ethers—Continued	
Benzenoid ethers—Continued	
*Nonylphenol, ethoxylated	ARC, BAS, CPC, DA(E), ETC, GAF, HDG, HTN(E), ICI, MCB, MIL, MOA, MON, MZC, OMC, RH, S, SHX, STC, STP, TCH, TMH, TX, UCC, WTC, WVA(E), X, X, X.
Nonylphenol, ethoxylated, phosphate esters	OMC.
*Nonylphenol, ethoxylated and propoxylated	GAF, RH, TMH, X.
Nonylphenol, ethoxylated with mixed fatty acids	SOS.
*Nonylphenol-formaldehyde, alkoxyated	WTC, X, X.
p-Nonylphenol-formaldehyde copolymer, ethoxylated and propoxylated	X.
Nonylphenol oleate, ethoxylated	SOS.
n-Octylphenol, propoxylated	AAC, DA(E), DUD, TCH.
Octylphenol, ethoxylated and benzylated	GAF.
tert-Octylphenol-formaldehyde, ethoxylated	SDW.
*Phenol, ethoxylated	DA(E), GAF, ICI, MCB, MIL, STC, TCH, X.
Phenol, propoxylated	RH.
p-Phenylphenol, alkoxyated	MCB.
p-Phenylphenol, ethoxylated and propoxylated	GAF.
Phenylstyrene, ethoxylated	STC.
Soya sterols, ethoxylated	SCP.
Stearyl alcohol and ethoxylated ceteryl alcohol	CRN, ETC.
Tridecylphenol, ethoxylated	AAC.
All other alkylphenol-formaldehyde condensates, alkoxyated	X.
Nonbenzenoid ethers:	
Chemically-defined linear alcohols, alkoxyated:	
Butanol, ethoxylated	DA(E), GAF, MCB.
Butyl alcohol, propoxylated	WTC.
*Decyl alcohol, ethoxylated	BAS, CPC, GAF, ICI, MCB, MIL, S, STC, TCH, X.
Decyl alcohol, ethoxylated and propoxylated	DA(E).
Decyloxypoly(ethyleneoxy)ethyl chloride	GAF.
*Dodecyl alcohol, ethoxylated	AAC, HDG, ICI, MIL, X, X.
Glycerine, ethoxylated and propoxylated	ETC.
Glycerol, ethoxylated	SVC.
Hexadecyl alcohol, ethoxylated	ETC, ICI, MZC, TCH.
N-Hexyl alcohol, ethoxylated	GAF.
Isoamyl alcohol, ethoxylated	GAF.
Isodecyl alcohol, alkoxyated	S.
Isostearyl alcohol, ethoxylated	SHX.
Methyl alcohol, alkoxyated	X.
*9-Octadecenyl alcohol, ethoxylated	AAC, DA(E), GAF, ICI, TCH.
*Octadecyl alcohol, ethoxylated	CRN, DA(E), GAF, ICI, STC.
*Oleyl alcohol, ethoxylated	CPC, CRD, ETC, GLY, HTN(E), MZC, S, SHX, STC.
Stearyl alcohol, propoxylated	SVC.
All other chemically defined linear alcohols, alkoxyated	BAS.
Coconut oil alcohol, ethoxylated	GAF, GLY, MZC, STC, TX.
Decyl and octyl alcohols, ethoxylated	GAF.
Developmental alcohol, ethoxylated	SHC.
Lanolin alcohol, propoxylated	CRN.
*Mixed linear alcohols, alkoxyated	GAF, WTC, X.
*Mixed linear alcohols, ethoxylated	BAS, DA(E), DUP, ETC, GAF, HDG, ICI, MCB, MIL, RH, S, SHC, SHX, STC, TCH, TMH, TNA, TX, UCC, VST, WTC, X.
Mixed linear alcohols, ethoxylated, benzyl ether	X.

SECTION 12. SURFACE-ACTIVE AGENTS

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1986

<i>Surface-active agents</i>	<i>Manufacturers' identification codes (according to list in table 3B)</i>
Nonionic—Continued	
Ethers—Continued	
Nonbenzenoid ethers—Continued	
*Mixed linear alcohols, ethoxylated and propoxylated	BAS, DA(E), DUP, ETC, GAF, MCB, MIL, OMC, S, STP, SVC, TCH, UCC, X.
Mixed linear alkylpoly(ethyleneoxy)ethyl chloride	GAF.
Myristyl alcohol, propoxylated	WTC.
Stearyl alcohol, propoxylated	WTC.
*Tallow alcohol, ethoxylated	AAC, MZC, SHX, STC, TX.
Wool wax alcohols, ethoxylated	CRD.
All other mixed linear alcohols, alkoxylated	DA(E), RH, X.
Other Ethers and thioethers:	
Bis(alkyl-aryl)alcohols, ethoxylated	DA(E).
Bis-cumylphenyl-oxoethylene titanate	KPI.
Butanediol, ethoxylated	ETC, GAF.
Butyl carbitol, ethoxylated and propoxylated	STP, WVA(E).
1,3-Butylene glycol, ethoxylated	STC.
Butynediol, ethoxylated	GAF.
Ceteryl alcohol and ethoxylated ceteryl alcohol	CRN.
tert-Dodecyl mercaptan, ethoxylated	AAC, GAF.
2-Ethylhexanol, ethoxylated	ETC.
Glycerine, ethoxylated	X.
Isodecyl alcohol, ethoxylated	ETC.
Isodecyl alcohol, ethoxylated and propoxylated	ETC, GAF, MCB.
Lignin, ethoxylated	WVA.
*Mixed alcohols, ethoxylated	CRN, MCB, MIL, RH, TCH, X.
Polyether diols	WTC.
Polyether triols	WTC.
*Poly(mixed ethylene, propylene)glycol	MIL, S, UCC, WM, WTC, X, X.
Poly(mixed ethylene/propylene glycol) capped with alkyl oxirone	X.
Poly(oxy-1,2-ethanediyl), α -phenylmethyl- ω -hydroxy, C ₁₂ -C ₁₆ alkyl ethers	PCI.
Poly(oxy-1,2-ethanediyl), α -phenylmethyl- ω - hydroxy, (ethoxylated nonylphenol) alkyl ether	PCI.
Polypropylene glycol butyl ether	CRN.
*Polypropylene glycol, ethoxylated	BAS, DA(E), MCB, MZC, STC, TCH, WTC, X, X.
3-Propanonitrate methylphenyl ether	PCI.
Rosin alcohol, ethoxylated	MZC.
2,4,7,9-Tetramethyl-5-decyne-4,7-diol, ethoxylated	DA(E), TCH.
Thiodiglycol, ethoxylated	GAF, MCB.
*Tridecyl alcohol, ethoxylated	CPC, DA(E), DUP, ETC, GAF, HTN(E), ICI, MCB, MIL, MZC, OMC, S, STC, TCH, WTC, X.
*Tridecyl alcohol, propoxylated and ethoxylated	DA(E), ETC, MCB, TX.
Trimethylheptanol, ethoxylated	TCH.
Trimethylnonyl alcohol, ethoxylated	TCH, UCC.
*Trimethylolpropane, alkoxylated	BAS, DA(E), GAF, MCB, WTC.
Trimethylpentanediol, ethoxylated	ETC.
All other ethers and thioethers	AAC, RH, X.
Other nonionic surface-active agents:	
Cumyl phenolate, isopropoxy titanium salt	KPI.
Formaldehyde, dicyandiamide, ethylene sulfate polymers	PCI.
(Mixed alkyl)phenol alkylenediaminealkanolamine formaldehyde	X.
Mixed fatty acid-ethoxylated nonylphenol ester	RPC.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1986

<i>Surface-active agents</i>	<i>Manufacturers' identification codes (according to list in table 38)</i>
Nonionic—Continued	
Other nonionic surface-active agents—Continued	
Naphthalenesulfonic acid polymer with formaldehyde and 4,4-dihydroxydiphenyl phenol, ammonium salt	PCI.
Octyl phosphate, ethoxylated	DUP.
Tetra-(2,2-dialkylloxymethylene)-1-butoxy titanium, bis-(dtridecyl) phosphite	KPI.
Tetra-isopropoxy titanium (bis-dioctyl) phosphite	KPI.
Tetra-octyloxy titanium (bis-tridecyl) phosphite	KPI.
Tri(castor oil alkyl)phosphate	GLY.
All other nonionic surface-active agents	BRI, CGY, CRN, DUP, MIL, PG, WM, X, X.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

SURFACE-ACTIVE AGENTS

Table 38

Surface-active agents alphabetical directory of manufacturers by code, 1986

(Names of manufacturers that reported production and/or sales of surface-active agents to the U.S. International Trade Commission for 1986 are listed below in the order of their identification codes as used in table 37)

<i>Code</i>	<i>Name of company</i>	<i>Code</i>	<i>Name of company</i>
AAC	Alcolac, Inc.	FPC	Fiambeau Paper Corp.
ACT	Southland Corp., Chemical Div.	FTX	Finetex, Inc.
ACY	American Cyanamid Co.	GAF	GAF Corp., Chemical Group
AGP	Dial, Corp.	GDC	Gresco, Inc.
APX	Apex Chemical Co., Inc.	GLY	Glyco, Inc.
ARC	Akzo Chemie America, Armat Chemicals	GRL	Vestal Laboratories, Inc.
ARD	Ardmore Chemical Co. Inc.	HAL	C. P. Hall Co.
ARL	Arol Chemical Products Co.	HDG	Hodag Chemical Corp.
ARZ	Arizona Chemical Co.	HEW	Hewitt Soap Co., Inc.
BAS	BASF Corp.	HIP	High Point Chemical Corp.
BFP	Breddo Corp.	HLI	Onyx Chemical Co.
BKM	Buckman Laboratories, Inc.	HMP	W. R. Grace & Co., Hampshire Chemicals Div.
BLA	Astor Products, Inc., Blue Arrow Div.	HNT	Huntington Laboratories, Inc.
BRD	Lonza, Inc.	HPC	Hercules, Inc.
BRI	Burlington Industries, Inc.	HRT	Hart Products Corp.
BSW	Original Bradford Soap Works, Inc.	HTN	Heterene Chemical Co.
BOE	Boehme Filatex, Inc.	HXL	Hexcel Corp., Hexcel Chemical Products Fine Organics
CAS	CasChem, Inc.	ICI	ICI Americas, Inc., Chemicals Div.
CCA	Interstab Chemicals, Inc.	JLP	J. L. Prescott Co.
CCC	C.N.C. International, Inc.	JOR	Jordan Chemical Co.
CCL	Catawba-Charlab, Inc.	JRG	Andrew Jergens Co.
CCW	Morton-Thiokol, Inc., Carstab Div.	JTO	Jetco Chemicals, Inc.
CGY	Ciba-Geigy Corp.	KPI	Kenrich Petrochemicals, Inc.
CHL	Chemol, Inc.	LAS	Los Angeles Soap Co.
CHP	C. H. Patrick & Co., Inc.	LEA	Leatex Chemical Co.
CIN	Stockhausen, Inc.	LEV	Lever Brothers Co.
CLD	Coliolds, Inc.	LKY	Lake States Div. of Rhineland Paper Co.
CLI	Clintwood Chemical Co.	LUR	Laurel Products Corp.
CLU	CL Industries, Inc.	MAR	Reed Lignin, Inc.
CLU	CL Industries, Inc.	MCB	Borg-Warner Corp., Borg Warner Chemicals
CMT	Chemithon Corp.	MCP	Moretex Chemical Products, Inc.
CON	Concord Chemicals Co., Inc.	MIL	Milliken & Co., Milliken Chemical Div.
CP	Colgate-Palmolive Co.	MIR	Miranol Chemical Co., Inc.
CPC	Grant Industries, Inc.	MOA	Mona Industries, Inc.
CRD	Croda, Inc.	MON	Monsanto Co.
CRN	CPC International, Inc., Amerchol Corp.	MRT	Morton-Thiokol, Inc., Morton Chemical Co. Div
CRT	Chemos Corp.	MRV	Marlowe-Van Loan Corp.
CTL	Continental Chemical Co.	MZC	Mazer Chemicals, Inc.
CYL	Cyclo Chemical Corp.	NCC	Niacet Corp.
DA	Diamond Shamrock Corp., Chemical Co.	NES	Ruetgers-Nease Chemical Co.
DAN	Dan River, Inc., Chemical Products Div.	NMC	National Milling & Chemical Co.
DEX	Dexter Chemical Corp.	NOC	Norac Co., Inc., Mathe Div.
DOW	Dow Chemical Corp.	NPR	Safeway Stores, Inc.
DUP	E. I. duPont de Nemours & Co., Inc. Chemicals & Pigments Dept.	NSC	National Starch & Chemical Corp.
ECC	Eastern Color & Chemical Co.	NTL	NL Industries, Inc.
EFH	E. F. Houghton & Co.	OMC	Olin Corp.
EK	Eastman Kodak Co.:	PAT	PatChem
EKT	Tennessee Eastman Co. Div.	PCI	Piedmont Chemical Industries, Inc.
EMK	Emkay Chemical Co.	PEL	Pelron Corp.
EMR	Emery Chemicals Div. of National Distillers & Chemical Corp.	PG	Procter & Gamble Co., Procter & Gamble Mfg. Co.
ENJ	Exxon Chemical Americas	PIL	Pilot Chemical Co.
ENO	Eneco, Inc.		
ENP	Insilco Corp. Enterprise Companies Div.		
ESS	Essential Industries, Inc.		
ETC	Ethox Chemicals, Inc.		
FER	Ferro Corp., Kell Chemical Div.		

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 38—Continued

Surface-active agents alphabetical directory of manufacturers by code, 1986

<i>Code</i>	<i>Name of company</i>	<i>Code</i>	<i>Name of company</i>
PLX	Desoto, Inc.	SPA	Scott Paper Co.
PNX	Murphy-Phoenix Co.	STC	American Hoechst Corp., Sou-Tex Works
PSP	Georgia-Pacific Corp., Bellingham Div.	STP	Stepan Chemical Co.
QCP	Quaker Chemical Corp.	SVC	Capital City Products Co., Armstrong Chemical Plant
RAY	ITT Rayonier, Inc.	SYL	Sylvachem Corp.
RBC	Artel Chemical Corp.	TCC	Sybron Chemicals, Inc.
RH	Rohm & Haas Co.	TCH	Emery Industries, Inc., Trylon Div.
ROB	Robeco Chemicals, Inc.	TCI	Dow Chemical Co., Textize Div.
RPC	Millmaster Onyx Group, Lyndall Chemical Co. Div.	TEN	Tennessee Chemical Co.
RSA	R.S.A. Corp.	TMH	Thompson Hayward Chemical Co.
S	Sandoz, Inc., Colors & Chemicals Div.	TNA	Ethyl Corp.
SBC	Scher Chemicals, Inc.	TNI	Gillette Co., Chemical Div.
SBP	SBS Products Inc.	TX	Texaco, Inc., Texaco Chemical Co.
SCM	SCM Gildco Organics	UCC	Union Carbide Corp.
SCO	Scholler, Inc.	UDI	Desoto, Inc.
SCP	Henkel Corp.	UNN	United Chemical Corp. of Norwood
SDC	Sandoz Chemicals Corp.	UPF	Jim Walter Resources, Inc., CIC Div.
SDH	Sterling Drug, Inc.:	USR	Uniroyal, Inc., Uniroyal Chemical Div.
SDI	Divestiture Corp.	UTC	Unitex Chemical Corp.
SDW	Sterling Organics Div.	VND	Van Dyk, Div. of Mallinckrodt, Inc.
SEA	Seaboard Chemicals, Inc.	VPC	Mobay Chemical Corp., Dye & Pigment Div.
SFS	Stauffer Chemical Co., Specialty & Chemicals Group.	VST	Vista Chemical Inc.
SHC	Shell Oil Co., Shell Chemical Co. Div.	WBG	White & Bagley Co.
SHX	Sherex Chemical Co., Inc.	WHW	Whittemore-Wright Co., Inc.
SLC	Soluol Chemical Co., Inc.	WM	Inolex Chemicals Co.
SLM	Salem Oil & Grease Co.	WPG	West Point-Pepperell, Inc., Griffitex Chemical Co. Sub.
SNW	Sun Chemical Corp., Chemicals Div.	WTC	Witco Chemical Corp.
SOP	Southern Chemical Products Co.	WVA	Westvaco Corp.
SOS	SSC Industries, Inc.		

Note.—Complete names, telephone numbers, and addresses of the above reporting companies are listed in app. A.
Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

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SYNTHETIC ORGANIC CHEMICALS, 1986

SECTION 13. PESTICIDES AND RELATED PRODUCTS

Stephen Wanser

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Pesticides and related products include fungicides, herbicides, insecticides, rodenticides, and related products such as plant growth regulators, seed disinfectants, soil conditioners, soil fumigants, and synergists. The data are given in terms of 100 percent active materials; they exclude such materials as diluents, emulsifiers, and wetting agents.

U.S. production of pesticides and related products in 1986 amounted to 1,180 million pounds-4.4 percent less than the 1,235 million pounds reported for 1985 (table 39).¹ Sales in 1986 were 940 million pounds, a decline of 8.0 percent, as compared with 1,022 million pounds reported in 1985; the value of sales was \$4,234 million in 1986, compared with \$4,437 million in 1985-a decline of 4.6 percent. Data for production of pesticides and related products during 1982-86 are shown in figure 14.

The output of cyclic pesticides and related products amounted to 862 million pounds in 1986-1.6 percent less than the 876 million pounds produced in 1985. Sales in 1986 were 692 million pounds, valued at \$2,964 million, compared with 713 million pounds, valued at \$3,266 million, in 1985.

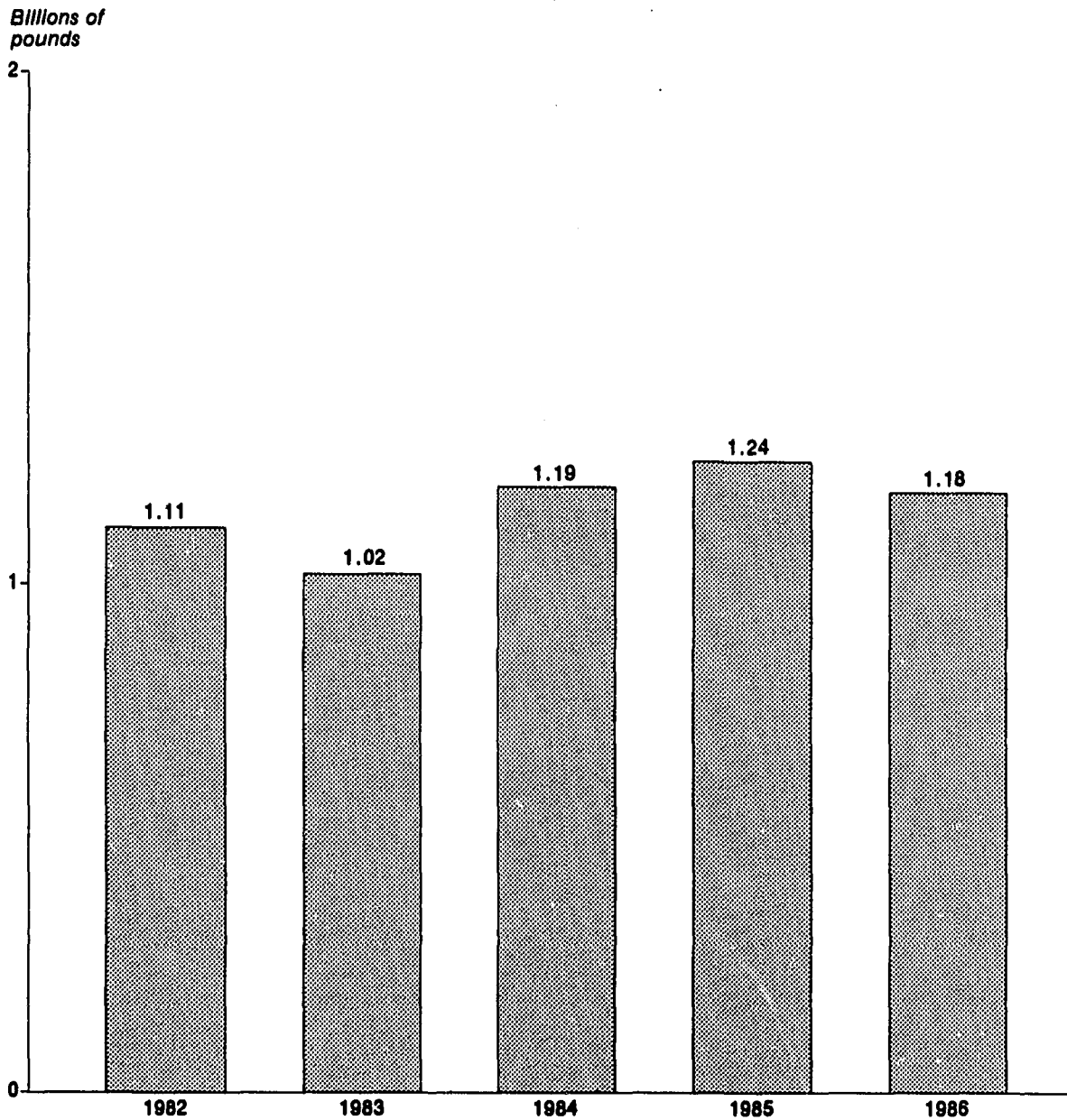
Production of acyclic pesticides and related products in 1986 amounted to 318 million pounds, compared with 359 million pounds reported for 1985. Sales in 1986 were 248 million pounds, compared with 309 million pounds reported for 1985; the value of sales were \$1,270 million in 1986, compared with \$1,171 million in 1985.

Table 40 lists the products reported in this section and indicates the manufacturer(s) of each by code. These codes are identified by company name in table 41.

¹ See also table 40, which list these products and identifies the manufacturers by codes. These codes are given in table 41.

SECTION 13. PESTICIDES AND RELATED PRODUCTS

Figure 14
Pesticides and related products



Source: U.S. International Trade Commission, *Synthetic Organic Chemicals: United States Production and Sales*.

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SYNTHETIC ORGANIC CHEMICALS, 1986

Table 39

Pesticides and related products: U.S. production and sales, 1986

(Listed below are all pesticides and related products for which any reported data on production or sales may be published. (Leaders (...)) are used where the reported data are accepted in confidence and may not be published or where no data were reported). Table 40 lists all pesticides and related products for which data on production and/or sales were reported and identifies the manufacturers of each]

Pesticides and related products	Sales			Unit value ¹
	Production	Quantity	Value	
	1,000 pounds	1,000 pounds	1,000 dollars	Per pound
Grand total	1,180,042	940,338	4,233,670	\$4.50
Cyclic				
Total	862,184	692,262	2,964,065 ²	4.28
Fungicides, total				
	95,002	72,769	246,449	.39
Naphthenic acid, copper salt .....	...	1,964	1,901	.97
All other cyclic fungicides ²	95,002	70,805	244,548	3.45
Herbicides and plant growth regulators, total				
	648,803	515,061	2,012,749	3.91
2,4-Dichlorophenoxyacetic acid, dimethylamine salt	18,999	16,627	10,890	.65
2,4-Dichlorophenoxyacetic acid, iso-octyl ester ..	...	10,160	9,550	.94
3',4'-Dichloropropionanilide (Propanil)	11,869	...	...	...
All other cyclic herbicides ³	617,935	488,274	1,992,309	4.08
Insecticides and rodenticides, total				
	118,379	104,432	704,867	6.75
Organophosphorus insecticides ⁴	53,820	52,155	268,661	5.15
Tricyclohexyltin hydroxide .....	...	2,222	23,659	10.65
All other cyclic insecticides and rodenticides ⁵	64,559	50,055	412,547	8.24
Acyclic				
Total	317,858	248,076	1,269,605	5.12
Fungicides⁶				
	18,269	16,485	37,716	2.29
Herbicides and plant growth regulators⁷				
	75,937	63,898	514,153	8.05
Insecticides, rodenticides, soil conditioners, and fumigants, total				
	223,652	167,693	717,736	4.28
Organophosphorus insecticides ⁸	71,907	40,668	235,607	5.79
Trichloronitromethane (chloropicrin)	12,677	6,900	7,161	1.04
All other acyclic insecticides, rodenticides, soil conditioners, and fumigants ⁹	139,068	120,125	474,968	3.95

¹ Calculated from unrounded figures.

² Includes benomyl, captan, captan, chlorothalonil, DMTT, folpet, ipron, PMA, and others.

³ Includes alachlor, atrazine, benefin, bensulfide, 2,4-D and other 2,4-D esters and salts, dicamba, dinitrophenol compounds, diuron, DNEP, isopropyl phenylcarbamates (IPC and CIPC), maleic hydrazide, molinate, NPA, picloram, triazines, trifluralin, uracils, plant growth regulators, and others.

⁴ Includes diazinon, methyl parathion, and other phosphorothioates and phosphorodithioates.

⁵ Includes carbaryl, chlorinated insecticides (chlordan, heptachlor, and others), insect attractants, DEET and other insect repellents, small amounts of rodenticides, and others.

⁶ Includes dithiocarbamates.

⁷ Includes butylate, dalapon, EPTC, methanearsonic acid salts, thiocarbamates, and organophosphorus herbicides, and others.

⁸ Includes acephate, disulfoton, ethion, malathion, phorate, and other organophosphorus insecticides.

⁹ Includes aldicarb, methomyl, methyl bromide, soil conditioners and fumigants, small quantities of rodenticides, and others.

Note.—Does not include data for the insect fumigant, p-dichlorobenzene, nor the fungicide, o-phenylphenol. These data are included in the section on "Cyclic Intermediates." It also does not include data for the fungicides, dimethyldithiocarbamic acid, sodium salt and dimethyldithiocarbamic acid, zinc salt (i.e., ziram). These data are included in the section on "Rubber-Processing Chemicals." The data for ethylene dibromide, a fumigant, are included in the "Miscellaneous End-Use Chemicals and Chemical Products" section.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

SECTION 13. PESTICIDES AND RELATED PRODUCTS

Table 40

Pesticides and related products for which U.S. production and/or sales were reported, identified by manufacturer, 1986

(Chemicals for which separate statistics are given in table 39 are marked below with an asterisk (*); chemicals not so marked do not appear in table 39 because the reported data are accepted in confidence and may not be published. Manufacturers' identification codes shown below are taken from table 41. An "X" signifies that the manufacturer did not consent to his identification with the designated product)

<i>Pesticides and related products</i>	<i>Manufacturers' identification codes (according to list in table 41)</i>
Cyelle	
*Fungicides:	
2-Bromo-4'-hydroxyacetophenone	BKM.
1-(4-Chlorophenoxy)-3,3-dimethyl-1-(1,2,4-triazol-1-yl)-butan-2-one	CHG.
α-(2-Chlorophenyl)-α-(4-chlorophenyl)-5-pyrimidinemethanol	LIL.
α-(2-Chlorophenyl)-α-(4-fluorophenyl)-5-pyrimidinemethanol	LIL.
2,4-Dichloro-6-(o-chloroanilino)-s-triazine	CHG.
1,4-Dichloro-2,5-dimethoxybenzene (Chloroneb)	CHF.
Di[phenylmercuric]doceceny succinate	TRO.
Hexahydro-1,3,5-triethyl-s-triazine	VNC.
Hexahydro-1,3,5-tri(2-hydroxyethyl)-s-triazine	X.
2-Mercaptobenzothiazole, sodium salt	NOD.
Mercaptobenzothiazole, zinc salt	VNC.
All other mercury fungicides, cyclic	NOD.
Methyl-1-(butylcarbamoil)-2-benzimidazolecarbamate (Benomyl)	DUP, USR.
2,2'-Methylenebis(4-chlorophenol) (Dichlorophene)	GIV.
3-(2-Methylpiperidino)propyl-3,4-dichlorobenzoate (Piperalin)	LIL.
5-Methyl-1,2,4-triazolo[3,4-b]benzothiazole (Tricyclazole)	LIL.
*Naphthenic acid, copper salt	CCA, MCI, NOD, TRO.
2-n-Octyl-4-isothiazolin-3-one	FER, RH.
Pentachlorophenol (PCP)	RCI.
Pentachlorophenol, sodium salt	FRO.
Phenylmercuric acetate (PMA)	COS.
Phenylmercuric ammonium acetate	COS, TRO.
Phenylmercuric oleate	COS, TRO.
8-Quinolinol, copper salt	NOD, SOL.
8-Quinolinol, magnesium salt	FMT.
8-Quinolinol, sulfate salt	SOL.
cis-N-[(1,1,2,2-Tetrachloroethyl)thio]-1-cyclohexene-1,2-dicarboximide (Captafol)	SOC.
2,4,5,6-Tetrachloroisophthalonitrile	SDS.
Tetrahydro-3,5-dimethyl-2H-1,3,5-thiadiazine-2-thione (DMTT)	MRK, USR, VCC.
2-(Thiocyanomethylthio)benzothiazole	BKM.
N-[(Trichloromethyl)thio]-4-cyclohexene-1,2-dicarboximide (Captan)	SFA, VNC.
N-(Trichloromethylthio)phthalimide (Folpet)	SFA.
1,3,5-Tri(2-isopropanol)-s-triazine	EFH.
All other cyclic fungicides	NOD.
*Herbicides and plant growth regulators:	
3-Amino-2,5-dichlorobenzoic acid, ammonium salt (2,5-Dichloro-3-aminobenzoic acid, ammonium salt)	UCC.
4-Amino-6-(1,1-dimethylethyl)-3-(methylthio)-1,2,4-triazin-5-(4H)-one	CHG.
4-Amino-3,5,6-trichloropicolinic acid (Picloram)	DOW.
4,6-Bis(isopropylamino)-2-methoxy-s-triazine (Prometon)	CGY.
2,4-Bis(isopropylamino)-6-(methylthio)-s-triazine (Prometryn)	CGY.
5-Bromo-3-sec-butyl-6-methyluracil (Bromacil)	DUP.
2-(sec-Butylamino)-4-ethylamino-6-methoxy-s-triazine	CGY.
2-(tert-Butylamino)-4-ethylamino-6-(methylthio)-s-triazine	CGY.
3-tert-Butyl-5-chloro-6-methyluracil	DUP.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 40—Continued

Pesticides and related products for which U.S. production and/or sales were reported, identified by manufacturer, 1986

<i>Pesticides and related products</i>	<i>Manufacturers' identification codes (according to list in table 41)</i>
Cyclole—Continued	
*Herbicides and plant growth regulators—Continued	
N-Butyl-N-ethyl- α, α, α -trifluoro-2,6-dinitro-p-toluidine (Benefin)	LIL.
Butyl 2-[4-[[5-(trifluoromethyl)-2-pyridinyl]oxy]-phenoxy]propanoate	X.
N-(Chloroacetyl)-N-(2,6-diethylphenyl)glycine, ethyl ethyl ester ..	FSN.
2-Chloro-4,6-bis(ethylamino)-s-triazine (Simazine)	CGY.
2-Chloro-4,6-bis(isopropylamino)-s-triazin (Propazine)	CGY.
2-Chloro-2',6'-diethyl-N-(n-butoxymethyl)acetanilide (Butachlor)	MON.
2-Chloro-2',6'-diethyl-N-(methoxymethyl)acetanilide (Alachlor)	MON.
2-Chloro-N-ethoxymethyl-N-(2-ethyl-6-methylphenyl)-acetamide (Acetochlor)	MON.
2-Chloro-4-(ethylamino)-6-(isopropylamino)-s-triazine (Atrazine)	CGY, SHC.
2-[4-Chloro-6-(ethylamino)-2-triazin-2-ylamino]-2-methylpropanitrile (cyanazine)	CGY, DUP, SHC.
2-Chloro-N-isopropylacetanilide (Propachlor)	MON.
2-Chloro-N-[(4-methoxy-6-methyl-1,3,5-triazin-2-yl)-aminocarbonyl]benzenesulfonamide	DUP.
2-(4-Chloro-2-methylphenoxy)propionic acid, dimethylamine salt	RIV.
2-(2-Chlorophenyl)methyl-4,4-dimethyl-3-isoxazolinone	FMN.
3-Cyclohexyl-6-(dimethylamino)-1-methyl-1,3,5-triazine-2,4-(1H,3H)-dione	DUP.
3,5-Dibromo-4-hydroxybenzonitrile (Bromoxynil)	RDA.
3,6-Dichloro-2-ansic acid (Dicamba)	VEL, ZOC.
2,6-Dichlorobenzonitrile	USR.
1-[(2,4-Dichlorophenyl)4-propyl-1,3-dioxolan-2-ylmethyl]-1H-1,2,4-triazole	CGY, SFA.
2-(2,4-Dichlorophenoxy)propionic acid, isooctyl ester	RIV.
*3',4'-Dichloropropanilide (Propanil)	CED, CYT.
S-(O,O-Diisopropyl phosphorodithioate) ester of N-(α -mercaptoethyl)benzenesulfonamide (Bensulide)	SFA.
1,1'-Dimethyl-4,4'-bipyridinium dichloride	X.
N,N-Dimethyl-2,2-diphenylacetamide (Diphenamid)	CWN.
Dimethyl-2,3,5,6-tetrachloroterephthalate (DCPA)	SDS.
N-(1,1-Dimethyl-2-propynyl)-3,5-dichlorobenzamide (Pronamide)	RH.
Dimethyl-2,3,5,6-tetrachloroterephthalate (DCPA)	SDS.
N-[5-(1,1-Dimethyl)-1,3,4-thiadiazol-2-yl]-N,N-dimethylurea (Tebuthiuron)	LIL.
1,1-Dimethyl-3-(α, α, α -trifluoro-m-tolyl)urea (Fluometuron)	FRI.
Dinitrobutylphenol (DNBP)	CED, USR.
Dinitrobutylphenol, ammonium salt	CED.
Dinitrobutylphenol, triethanolamine salt	CED.
2,6-Dinitro-N,N-dipropyl cumidine	LIL.
3,5-Dinitro-N ₄ ,N ₄ -dipropylsulfanilamide	X.
2-(Ethylamino)-4-(isopropylamino)-6-(methylthio)-s-triazine (Ametryne)	CGY.
5-Ethyl cyclohexylethylthiocarbamate	SFA.
S-Ethyl-hexahydro-1H-azepine-1-carbothioate (Molinate)	SFA.
N-[3-(1-Ethyl-1-methylpropyl)-5-isoxazolyl]-2,6-dimethoxybenzamide (Flexidor)	LIL.
N-(1-Ethylpropyl)-3,4-dimethyl-2,6-dinitrobenzenamine	ACY.
2-(Ethylthio)-4,6-bis(isopropylamino)-s-triazine	CGY.

SECTION 13. PESTICIDES AND RELATED PRODUCTS

Table 40—Continued

Pesticides and related products for which U.S. production and/or sales were reported, identified by manufacturer, 1986

<i>Pesticides and related products</i>	<i>Manufacturers' identification codes (according to list in table 41)</i>
Cyclic—Continued	
*Herbicides and plant growth regulators—Continued	
3-Isopropyl-1H-2,1,3-benzothiadiazin-4(3H)-one 2, 2-dioxide . . .	BAS.
Isopropyl N-(3-chlorophenyl)carbamate (CIPC)	PPG.
Isopropyl N-phenylcarbamate (IPC)	PPG.
2-(2-Methyl-4-chlorophenoxy)propionic acid, diethanolamine salt	RIV.
2-(2-Methyl-4-chlorophenoxy)propionic acid, isooctyl ester	RIV.
1-(2-Methylcyclohexyl)-3-phenylurea (Siduron)	ADC, DUP.
Methyl 5-(2',4'-dichlorophenoxy)-2-nitrobenzoate	RDA.
Methyl 2-[[[(4,6-dimethyl-2-pyrimidinyl)amino]- carbonyl]amino]sulfonyl]benzoate	DUP.
1-Methyl-3-phenyl-5-[3-(trifluoromethyl)phenyl] 4(1H)-pyridone (Fluridone)	LIL.
N-1-Naphthylphthalamic acid (NPA)	DRX, USR.
7-Oxabicyclo-[2.2.1]-heptane-2,3-dicarboxylic acid, disodium salt (Endothal)	PAS.
Phenoxyacetic acid derivatives:	
4-Chloro-2-methylphenoxyacetic acid, dimethylamine salt	RIV.
4-Chloro-2-methylphenoxyacetic acid, iso-octyl ester	RIV.
2,4-Dichlorophenoxyacetic acid, esters and salts:	
2,4-Dichlorophenoxyacetic acid (2,4-D)	DOW, UCC, VTC.
2,4-Dichlorophenoxyacetic acid, butoxyethanol ester	DOW.
2,4-Dichlorophenoxyacetic acid, n-butyl ester	VTC.
2,4-Dichlorophenoxyacetic acid, sec-butyl ester	DOW.
2,4-Dichlorophenoxyacetic acid, dimethylamine salt	DOW, PBI, RIV, VTC.
2,4-Dichlorophenoxyacetic acid, ethanolamine and isopropanolamine salts	DOW.
2,4-Dichlorophenoxyacetic acid, iso-octyl ester	DOW, RIV.
2,4-Dichlorophenoxyacetic acid, isopropyl ester	AMV.
All other 2,4-dichlorophenoxyacetic acid, esters and salts . . .	UCC, VEL.
Plant growth regulators:	
N-[(Acetylamino)methyl]-2-chloro-N-(2,6- diethylphenyl)acetamide	MON.
2-Chloro-N-(2,6-dinitro-4-(trifluoromethyl)phenyl)- N-ethyl-6-fluorobenzenemethanamine	CGY.
β-(4-Chlorophenyl)methyl-α-(1,1-dimethylethyl)-1, 2,4-triazole-1-ethanol	X.
2-Chloro-6-(trichloromethyl)pyridine	DOW.
α-Cyclopropyl-α-(p-methoxyphenyl)-5-pyrimidine methanol (Ancymidol)	LIL.
1,2-Dihydro-3,6-pyridazinedione (Maleic hydrazide) (MH)	DRX, USR.
1,1-Dimethylpiperidinium chloride	BAS.
N-[2,4-dimethyl-5-[[trifluoromethyl]sulfonyl]- amino]phenyl]acetamide, diethanolamine salt	MMM.
Gibberellic acid	ABB.
3-Indolebutyric acid	MRK.
1-Naphthaleneacetic acid, sodium salt	GNW.
3,5,6-Trichloro-2-pyridinyloxyacetic acid	DOW.
α,α,α-Trifluoro-2,6-dinitro-N-ethyl-N-(2-methyl-2- propenyl)-p-toluidine (Ethylfluralin)	LIL.
α,α,α-Trifluoro-2,6-dinitro-N,N-dipropyl-p- toluidine (Trifluralin)	LIL.
All other cyclic herbicides	FRI, NES, SFA, SHO, X.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 40—Continued

Pesticides and related products for which U.S. production and/or sales were reported, identified by manufacturer, 1986

Pesticides and related products	Manufacturers' identification codes (according to list in table 41)
Cyelo—Continued	
Insect attractants and repellents:	
N,N-Diethyltoluamide (DEET)	MRF, TNA, VGC.
All other insect attractants	X.
Insecticides:	
<i>Bacillus thuringiensis</i>	ABB, CLP.
Bis(pentachloro-2,4-dicyclopentadien-1-yl)	HK.
2,3,4,5- δ -Butylenetetrahydrofural	PLC.
2-(p-tert-Butylphenoxy)cyclohexyl-2-propynyl sulfite	ACY, USR.
2-(2-Chlorophenyl)methyl-4,4-dimethyl-3-isoxazolidinone	NES.
Cyano(4-fluoro-3-phenoxyphenyl)methyl-3-(2,2-dichloroethenyl)-2,2-dimethylcyclopropanecarboxylate	NES.
Cyano-3-phenoxybenzyl-cis, trans-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropane carboxylate	X.
Cypermethrin	LED, SHC.
2,3-Dihydro-2,2-dimethyl-7-benzofuranyl[(dibutylamino)thio]methylcarbamate	FMN.
2,3-Dihydro-2,2-dimethyl-7-benzofuranyl methylcarbamate	FMN.
2,2-Dimethyl-1,3-benzodioxol-4-yl N-methylcarbamate	FSN.
Di-n-propylisocinchomeronate	MGK.
Distimnaxane, hexakis(2-methyl-2-phenylpropyl)	DUP.
Isopropyl-11-nitroethoxy-3,7,11-trimethyldodeca-2,4-dienoate	X.
Methyl 3-(2,2-dichloroethenyl)-2,2-dimethyl-3-cyano-3-phenoxyphenylcyclopropanecarboxylate	FMN.
1-Naphthyl-N-methylcarbamate (Carbaryl)	UCC.
3-(Phenoxyphenyl)methyl-cis, trans-3-(2,2-dichloroethenyl)-2,2-dimethyl cyclopropane-cyclopropanecarboxylate	CED, FMN, X.
Tetrahydro-5,5-dimethyl-2(1H)-pyrimidinone[3-[4-(trifluoromethyl)phenyl]-1-[2-[4-(trifluoromethyl)phenyl]ethenyl]-2-propenylidene]hydrozone	ACY.
Tricyclohexyltin hydroxide	DOW, X, X.
2,3,5-Trimethylphenol	X.
Chlorinated insecticides:	
2-Chloro-N-[[4-(trifluoromethoxy)phenyl]amino]-carbonyl]benzamide	CHG.
Ethyl 4,4'-dichlorobenzilate (Chlorobenzilate)	CGY.
Heptachlor-tetrahydro-endo-methanindene (Heptachlor)	VEL.
Octachlorohexahydro-4,7-methanindene (Chlordan)	VEL.
Toxaphene (Chlorinated camphene)	FSN.
1,1,1-Trichloro-2,2-bis(p-methoxyphenyl)ethane (Methoxychlor)	CHF.
*Organophosphorus insecticides:	
o-(2,4-Dichlorophenyl) O-ethyl S-propylphosphorodithioate	CHG.
2-(Diethoxyphosphinylimino)-4-methyl-1,3-dithiolane	ACY.
o-(2-(Diethylamino)-6-methyl(4-pyrimidinyl) o,o-dimethyl phosphorothioate	X.
o,o-Diethyl O-(2-diethylamino-6-methyl-4-pyrimidinyl) phosphorothioate	X.
o,o-Diethyl O-(2-isopropyl-4-methyl-6-pyrimidinyl)-phosphorothioate (Diazinon)	CGY, VEL.
o,o-Diethyl O-[4-(methylsulfinyl)phenyl]-phosphorothioate	CHG.
o,o-Diethyl O-(p-nitrophenyl)phosphorothioate (Parathion)	MON.
o,-Diethyl O-3,5,6-trichloro-2-pyridyl-phosphorothioate	DOW.

SECTION 13. PESTICIDES AND RELATED PRODUCTS

Table 40—Continued

Pesticides and related products for which U.S. production and/or sales were reported, identified by manufacturer, 1986

<i>Pesticides and related products</i>	<i>Manufacturers' identification codes (according to list in table 41)</i>
Cyclic—Continued	
Insecticides—Continued	
*Organophosphorus —Continued	
O,O-Dimethyl O-[4-(methylthio)-m-tolyl]-phosphorothioate (Fenthion)	CHG.
O,O-Dimethyl α-(p-nitrophenyl)phosphorothioate (Methyl parathion)	MON.
O,O-Dimethyl S-[(4-oxo-1,2,3-benzotriazin-3(3H)-yl)methyl]phosphorodithioate (Azinphos-methyl)	CHG.
2,3-p-Dioxanedithiol S,S-bis-(O,O-diethyl-phosphorodithioate (Dioxathion)	FSN.
O-Ethyl O-[4-(methylthio)phenyl] S-propyl-phosphorodithioate	CHG.
O-Ethyl O-(p-nitrophenyl)phenylphosphonothioate (EPN)	DUP, SFS.
O-Ethyl-S-phenylethylphosphonodithioate	SFA.
O,O'-(Thiodi-4,1-phenylene)bis(o,o-dimethyl phosphorothioate (Temphos)	SFA.
N-(Mercaptomethyl)phthalimide S-(O,O-dimethyl-phosphorodithioate)	SFA, X.
All other organophosphorus insecticides, cyclic	SFA, SHO.
All other cyclic insecticides	FMN.
Rodenticides:	
3-(α-Acetylbenzyl)-4-hydroxycoumarin (Warfarin)	MOT.
3-[3-(4'-Bromo[1,1'-biphenyl]-4-yl)-1,2,3,4-tetrahydro-1-naphthalenyl]-4-hydroxy-2H-1-benzopyran-2-one	LIL, X.
2-Diphenylacetyl-1,3-indandione and sodium salt	MOT.
2-Isovaleryl-1,3-indandione	MOT.
2-Pivaloyl-1,3-indandione (Pindone)	MOT.
All other rodenticides, cyclic	RBC.
All other cyclic pesticides:	
Benzyl-2-chloro-4-(trifluoromethyl)-5-thiazole-carboxylate	MON.
α-[2-(2-n-Butoxyethoxy)ethoxy]-4,5-methylene-dioxy-2-propyltoluene. (Piperonyl butoxide)	ALP, TNA.
N-(2-Ethylhexyl)bicyclo(2.2.1)-5-heptene-2,3-dicarboximide	MGK.
Acyclic	
*Fungicides:	
Bis-1,4-bromoacetoxy-2-butene	VIN.
Bis(tributyltin) oxide	X.
Chloromethoxypropylmercuric acetate	TRO.
1,2-Dibromo-2,4-dicyanobutane	MRK.
Disodium cyanodithioimidocarbonate	BKM.
n-Dodecylguanidine acetate (Dodine)	ACY.
Dodecylguanidine hydrochloride	MRK.
Methylenebis(thiocyanate)	MRK, VIN.
Poly[oxyethylene(dimethylimino)ethylene-(dimethylimino)ethylene dichloride]	BKM.
Tributyltin chloride	X.
Dithiocarbamic acid fungicides:	
Dimethyldithiocarbamic acid, potassium salt	ALC, BKM.
Ethylene bis(dithiocarbamic acid), disodium salt (Nabam)	ALC, VCC.
Ethylene bis(dithiocarbamic acid), manganese salt (Maneb) ...	DUP.
Ethylene bis(dithiocarbamic acid), manganese salt with zinc ions	DUP.
Hydroxymethyl(methyl)dithiocarbamic acid, potassium salt ...	BKM.
N-Methyldithiocarbamic acid, potassium salt	BKM.
All other dithiocarbamic acid fungicides, acyclic	VCC.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 40—Continued

Pesticides and related products for which U.S. production and/or sales were reported, identified by manufacturer, 1986

<i>Pesticides and related products</i>	<i>Manufacturers' identification codes (according to list in table 41)</i>
Acyclic—Continued	
All other acyclic fungicides	VCC.
*Herbicides and plant growth regulators:	
2,2-Dichloropropionic acid, sodium salt (Dalapon)	DOW.
Dimethylarsinic acid (Cacodylic acid)	VIN.
S-Ethyl diisobutylthiocarbamate (Butylate)	PPG, SFA.
S-Ethyl dipropylthiocarbamate (EPTC)	PPG, SFA.
Methanearsonic acid, disodium salt (DSMA)	VIN.
Methanearsonic acid, monosodium salt (MSMA)	SDS.
Methylthiosulfonic acid, S-(2-hydroxypropyl) ester	BKM.
N-(Phosphonomethyl)glycine, isopropylamine salt	MON.
S-Propyl butylethylthiocarbamate (Pebulate)	SFA.
S-Propyl dipropylthiocarbamate (Vernolate)	SFA.
Thiocyanic acid, methylene ester	BKM.
S,S,S-Tributyl phosphorotrithioate	CHG.
Tributyl phosphorotrithioate (Merphos)	RDA.
S-(1,2,3-Trichloroethyl)diisopropylthiocarbamate (Triallate) ..	MON.
Plant growth regulators:	
2-(Chloroethyl)phosphonic acid	UCC.
N-(Phosphonomethyl)glycine, sodium sesqui salt	MON.
All other plant growth regulators, acyclic	USR.
All other acyclic herbicides	DUP, SHC, UCC.
Insecticides:	
Ethyl 3,7,11-trimethyldodeca-2,4-dienoate	DOW, X.
Isopropyl-11-methoxy-3,7,11-trimethyldodeca-2,4-dienoate ..	X.
Methyl N',N'-dimethyl-N-(methylcarbamoyl)oxy-1- thiooxamidate	DUP.
S-Methyl-N-(methylcarbamoyl)oxythioacetimidate (Methomyl)	DUP, SHC.
2-Methyl-2-(methylthio)propionaldehyde O- (methylcarbamoyl)oxime (Aldicarb)	UCC.
*Organophosphorus insecticides:	
S-1,2-Bis(ethoxycarbonyl)ethyl O,O-dimethyl phosphorodithioate (Malathion)	ACY.
2-Carbomethoxy-1-propen-2-yl dimethyl phosphate	AMV, DUP, SHC.
1,2-Dibromo-2,2-dichloroethyl dimethyl phosphate (Naled)	AMV.
O,O-Diethyl S-[2-(ethylthio)ethyl]phosphorodithioate (Disulfoton)	CHG.
O,O-Diethyl O-[2-(ethylthio)ethyl]phosphorothioate (Demeton O)	CHG.
O,O-Diethyl S-[(ethylthio)methyl]phosphorodithioate (Phorate)	ACY.
3-(Dimethoxyphosphinyloxy)-N,N-dimethyl-cis- crotonamide	SHC.
O,S-Dimethylacetylphosphoramidothioate (Acephate)	SOC.
O,O-Dimethyl-O-2,2-dichlorovinyl phosphate (DDVP)	AMV.
S-[[[1,1-Dimethylethyl]thio]methyl] O,O-diethyl- phosphorodithioate (Turbufos)	ACY.
Dimethyl phosphate of 3-hydroxy-N-methyl-cis- crotonamide	SHC.
O,S-Dimethyl phosphoramidothioate	CHG.
O,O,O',O'-Tetraethyl S,S'-methylene- bisphosphorodithioate (Ethion)	FMN.
All other organophosphorus insecticides, acyclic	SHC.
All other acyclic insecticides	SHC.
Rodenticides:	
2-Hydroxyethyl n-octyl sulfide	PLC.
Sodium fluoroacetate	RBC, TUL.
All other rodenticides, acyclic	RBC.

SECTION 13. PESTICIDES AND RELATED PRODUCTS

Table 40—Continued

Pesticides and related products for which U.S. production and/or sales were reported, identified by manufacturer, 1985

<i>Pesticides and related products</i>	<i>Manufacturers' identification codes (according to list in table 41)</i>
Acyclic—Continued	
Soil conditioners:	
Polyacrylonitrile, hydrolyzed, sodium salt	ACY.
Soil fumigants:	
1,3-Dichloropropene	DOW.
O-Ethyl S,S-dipropyl phosphorodithioate	RDA.
Methyl bromide (Bromomethane)	GTL.
N-Methyldithiocarbamic acid, sodium salt (Metham)	BKM, SFA.
Methyl isothiocyanate and 1,3-dichloropropene	MRT.
*Trichloronitromethane (Chloropicrin)	LCP, NLO, TNA.
All other acyclic pesticides:	
3-Alkoxy-2-hydroxypropyl trimethyl ammonium chloride	X.
Ammonium oxydiethylenedis (alkyl* dimethyl chloride)	
*Alkyl-40% C ₁₂ , 50% C ₁₄ , 10% C ₁₆	BKM.
Bromoacetic acid	VIN.
N-Cocoalkyl-1,3-propylenediamine acetate	X.
2-[(Hydroxymethyl) amino]-2-methylpropanol	TRO.
2-[(Hydroxymethyl)]ethanol	TRO.
3-Iodo-2-propynyl butylcarbamate	TRO.
All other pesticides and related products, acyclic	CWN, DUP, SHC, USR, X.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 41

Pesticides and related products alphabetical directory of manufacturers by code, 1986

(Names of manufacturers that reported production and/or sales of pesticides and related products to the U.S. International Trade Commission for 1986 are listed below in the order of their identification codes as used in table 40)

<i>Code</i>	<i>Name of company</i>	<i>Code</i>	<i>Name of company</i>
ABB	Abbott Laboratories	MGK	McLaughlin Gormley King Co.
ACY	American Cyanamid Co.	MMM	Minnesota Mining & Manufacturing Co.
ADC	Anderson Development Co.	MON	Monsanto Co.
ALC	Alco Chemical Corp.	MOT	Motomco, Ltd.
ALP	Alpha Laboratories, Inc.	MRF	Morfex Corp.
AMV	Amvac Chemical Corp.	MRK	Merck & Co., Inc.
BAS	BASF Corp.	MRT	Morton-Thiokol, Inc., Morton Chemical Co. Div.
BKM	Buckman Laboratories, Inc.	NES	Ruetgers-Nease Chemical Co.
CCA	Interstab Chemicals, Inc.	NLO	Niklor Chemical Co., Inc.
CED	Cedar Chemical Co.	NOD	Nuodex, Inc.
CGY	Ciba-Geigy Corp., Agricultural Div.	PAS	Pennwalt Corp.
CHF	Kincaid Enterprises, Inc.	PBI	PBI-Gordon Corp.
CHG	Mobay Chemical Corp., Agricultural Chemicals Div.	PLC	Phillips Petroleum Co.
COS	Cosan Chemical Corp.	PPG	PPG Industries, Inc.
CWN	Upjohn Co., Fine Chemicals	RBC	Artel Chemical Corp.
CYT	Cumberland International Corp.	RDA	Rhone-Poulenc, Inc.
DOW	Dow Chemical Co.	RH	Rohm & Haas Co.
DRX	Drexel Chemical Co.	RIV	Riverdale Chemical Co.
DUP	E. I. duPont de Nemours & Co., Inc. Agricultural Dept.	SDS	Fermenta Plant Protection Stauffer Chemical Co.:
EFH	E. F. Houghton & Co.	SFA	Agricultural Products Div.
FER	Ferro Corp., Ferro Chemical Div.	SHC	Shell Oil Co., Shell Chemical Co. Div.
FMN	FMC Corp., Agricultural Chemical Group	SOC	Chevron Corp., Chevron Chemical Co.
FMT	Fairmount Chemical Co., Inc.	TNA	Ethyl Corp.
FRI	Farmland Industries, Inc.	TRO	Troy Chemical Corp.
FRO	Vulcan Materials Co., Chemicals Div.	TUL	Tull Chemical Co., Inc.
FSN	Nor-Am Chemical Co.	UCC	Union Carbide Corp.
GIV	Givaudan Corp.	USR	Uniroyal, Inc., Uniroyal Chemical Group
GTL	Great Lakes Chemical Corp.	VCC	Vinings Chemical Co.
HEX	Hexagon Laboratories, Inc.	VEL	Velsicol Chemical Corp.
HK	Occidental Chemical Corp., Speciality Chemical Div.	VGC	Virginia Chemicals, Inc.
LCP	LCP Chemicals-Maine	VIN	Vineland Chemical Co., Inc.
LIL	Eli Lilly & Co.	VNC	Vanderbilt Chemical Corp.
MCI	Mooney Chemical, Inc.	VTC	Vertac Chemical Corp.
		ZOC	Sandoz Crop Protection

Note.—Complete names, telephone numbers, and addresses of the above reporting companies are listed in app. A.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

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SECTION 14. MISCELLANEOUS END-USE CHEMICALS AND CHEMICAL PRODUCTION

David G. Michels

202-523-0293

This section incorporates those end-use groups which are not readily classifiable within the prior sections of this report. Both cyclic and acyclic chemicals fall within this section. With the exception of enzymes and fuel additives, both production and sales of all other end-use groups contained within this section have increased for the first time since 1981.

In 1986, the production of miscellaneous end-use chemicals exceeded 23,033 million pounds, an increase of 3.7 percent from the more than 22,214 million pounds of production reported for 1985. Except for 1982, production of these chemicals remained nearly level throughout 1982-86 (figure 15). Sales in 1986 totaled 16,600 million pounds, valued at \$8,731 million (table 42). The sales quantity increased 2 percent from that of 1985 with the value of sales increasing by 41 percent. Polymers for fibers and urea collectively accounted for 70 percent of the 1986 production of these miscellaneous end-use chemicals. Urea accounted for 51 percent of the 1986 sales quantity of these chemicals.

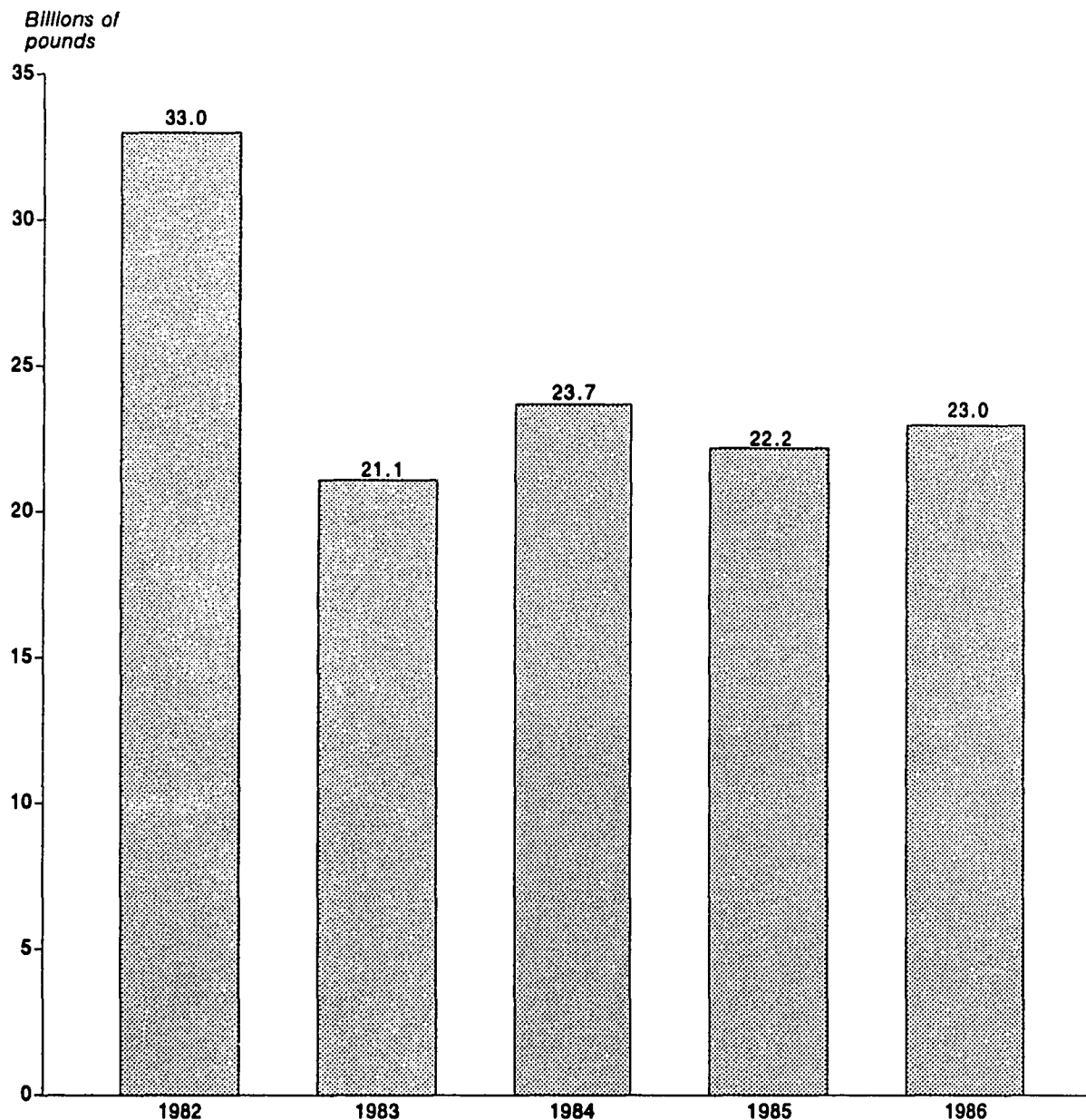
In 1986, the production of lubricating oil and grease additives totaled 652 million pounds, a decrease of 54 percent, compared with 1985. Total sales quantity for 1986 was 590 million pounds, 41 percent less than the 1985 sales quantity of 998 million pounds, while the value of sales decreased by 47 percent to \$378 million.

Production of fuel additives for 1986 totaled 3,657 million pounds, an increase of 64 percent from the previous year. Total sales quantity for 1986 was 2,582 million pounds, up 42 percent from the 1985 sales quantity of 1,817 million pounds, with the sales value decreasing 7 percent to \$530 million.

Table 43 lists the products reported in this section and indicates the manufacturer(s) of each by code. These codes are identified by company name in table 44.

SECTION 14. MISCELLANEOUS END-USE CHEMICALS AND CHEMICAL PRODUCTS

Figure 15
Miscellaneous End-Use Chemicals
and Chemical Products



Source: U.S. International Trade Commission, *Synthetic Organic Chemicals: United States Production and Sales*.

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SYNTHETIC ORGANIC CHEMICALS, 1986

Table 42

Miscellaneous end-use chemicals and chemical products: U.S. production and sales, 1986

(Listed below are all miscellaneous end-use chemicals and chemical products for which any reported data on production or sales may be published. (Leaders (...)) are used where the reported data are accepted in confidence and may not be published or where no data were reported.) Table 43 lists all miscellaneous end-use chemicals and chemical products for which data on production and/or sales were reported and identifies the manufacturers of each)

<i>Miscellaneous end-use chemicals and chemical products</i>	<i>Sales</i>			
	<i>Production</i>	<i>Quantity</i>	<i>Value</i>	<i>Unit value¹</i>
	<i>1,000 pounds</i>	<i>1,000 pounds</i>	<i>1,000 dollars</i>	<i>Per pound</i>
Grand total	23,033,373	16,599,788	8,731,412	\$0.53
Amino acids and their salts	158,202	137,972	166,087	1.20
Chelating agents, nitriloacids and salts, total	307,375	219,554	103,290	.47
(Ethylenedinitrilo)tetraacetic acid (EDTA)	10,154	8,899	8,013	.90
(Ethylenedinitrilo)tetraacetic acid, disodium copper salt, dihydrate	774	602	791	1.31
(Ethylenedinitrilo)tetraacetic acid, disodium salt ..	...	845	1,496	1.77
(Ethylenedinitrilo)tetraacetic acid, monosodium iron salt	1,210	1,668	1,439	.86
(Ethylenedinitrilo)tetraacetic acid, tetrasodium salt .....	...	74,124	24,383	.33
(N-Hydroxyethylethylenedinitrilo)triacetic acid, trisodium salt .....	...	6,536	3,684	.56
Nitrilo-tris-methylene triphosphonic acid	1,401	1,259	988	.79
All other chelating agents, nitriloacids and salts ..	293,836	125,621	62,496	.50
Chemical reagents and fine chemicals	309	295	32,760	111.08
Enzymes, total	(2)	(2)	81,653	(2)
Bacterial amylase	(2)	(2)	17,647	(2)
Pectinase	(2)	(2)	1,131	(2)
Proteases, total	(2)	(2)	31,883	(2)
Rennin	(2)	(2)	17,838	(2)
All other proteases	(2)	(2)	14,045	(2)
All other enzymes	(2)	(2)	30,992	(2)
Flotation reagents	17,161	18,439	6,654	.36
Fuel additives, total ²	3,656,955	2,582,007	529,514	.21
Methyl-t-butyl ether ⁴	3,375,291	71,590	262,681	.11
All other fuel additives	281,664	210,417	266,833	1.27
Lubricating oil and grease additives, total	651,699	590,320	378,027	.64
Oil soluble petroleum sulfonates:				
Oil soluble petroleum sulfonate, barium salt	8,478	...	...	...
Oil soluble petroleum sulfonate, calcium salt	253,565	209,004	129,425	.62
All other lubricating oil and grease additives	389,656	381,316	248,602	.64
Paint driers, naphthenic acid salts, total ³	9,900	...	...	...
Calcium naphthenate	505	411	411	1.00
Cobalt naphthenate	3,769	3,257	8,996	2.76
Manganese naphthenate	455	517	413	.80
All other paint driers, naphthenic acid salts	5,171	...	...	...
Photographic chemicals, total	9,994	4,808	37,003	7.79
p-Diethylaminobenzendiazonium chloride	76	81	399	4.90
All other photographic chemicals	9,918	4,727	36,604	7.62
Polymers for fibers, total	6,581,746	...	...	...
Nylon 6 and 6/6 ⁴	2,193,855	...	...	...
Polyacrylonitrile and acrylonitrile copolymers ⁴	580,430	...	...	...

See footnotes at end of table.

SECTION 14. MISCELLANEOUS END-USE CHEMICALS AND CHEMICAL PRODUCTS

Table 42—Continued

Miscellaneous end-use chemicals and chemical products: U.S. production and sales, 1986

<i>Miscellaneous end-use chemicals and chemical products</i>	<i>Sales</i>			
	<i>Production</i>	<i>Quantity</i>	<i>Value</i>	<i>Unit value¹</i>
	<i>1,000 pounds</i>	<i>1,000 pounds</i>	<i>1,000 dollars</i>	<i>Per pound</i>
Polymers for fibers—Continued				
Polyethylene terephthalate	2,402,457	...	...	...
All other polymers for fibers	1,405,004	...	...	...
Polymers, water soluble, total	434,183	338,044	425,739	1.26
Acrylamide polymers and copolymers	92,096	48,011	59,203	1.23
Cellulose esters and ethers	173,648	148,575	228,709	1.54
Polyacrylic acid salts, total .....	...	73,256	56,238	.77
Sodium ammonium polyacrylate and copolymers	21,336	...	...	...
All other polyacrylic acid salts .....	...	73,256	56,238	.77
All other water soluble polymers	147,103	68,202	81,589	1.20
Textile chemicals,				
other than surface-active agents, total	52,678	50,920	24,760	.49
Dimethylolhydroxyethylene urea	24,855	...	...	...
Urea polymers with formaldehyde and methanol ..	401	374	203	.54
All other textile chemicals, other than surface-active agents	27,422	50,546	24,557	.49
Urea in compounds or mixtures:				
In feed compounds	273,929	209,157	14,813	.07
In liquid fertilizer	2,527,076	2,173,625	132,254	.06
In solid fertilizer	6,699,302	6,016,981	308,232	.06
All other miscellaneous end-use chemicals and chemical products ⁷	1,652,864	4,253,481	6,480,806	1.52

¹ Calculated from unrounded figures.

² Not available.

³ Statistics exclude production and sales of tricresyl phosphate. Statistics on tricresyl phosphate are given with the section on "Plasticizers."

⁴ The difference between the production reported here and that shown on the *Preliminary Report on U.S. Production of Selected Organic Chemicals (Including Synthetic Plastics and Resins Materials), 1986*, results from a combination of incorrect reporting by some companies, end-of-year inventory adjustment, and rounding.

⁵ Quantities are given on the basis of solid naphthenate.

⁶ Statistics exclude production and sales of copper naphthenate. Statistics for copper naphthenate are given in the section on "Pesticides and Related Products."

⁷ Includes all other items listed in table 43 which are not individually publishable as groups.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 43

Miscellaneous end-use chemicals and chemical products for which U.S. production and/or sales were reported, identified by manufacturer, 1986

(Chemicals for which separate statistics are given in table 42 are marked below with an asterisk (*); chemicals not so marked do not appear in table 42 because the reported data are accepted in confidence and may not be published. Manufacturers' identification codes shown below are taken from table 44. An "X" signifies that the manufacturer did not consent to his identification with the designated product)

<i>Miscellaneous end-use chemicals and chemical products</i>	<i>Manufacturers' identification codes (according to list in table 44)</i>
* Amino acids and their salts:	
Aspartic acid	ESX, PFZ, PPG.
N,N-Bis(2,2-acetamido)glycine	PIC.
N,N-Dimethylglycine	MCK.
N,N-Dimethylglycine hydrochloride	MCK.
Glutamic acid hydrochloride	LEM.
Glycine (Aminoacetic acid), non-medical	CHT, HMP.
Methionine and its salts:	
Methionine (animal feed grade)	DGC.
Methionine, hydroxy analogue, calcium salt	MON.
Phenylalanine	NSW.
Potassium glutamate	LEM.
Protein hydrosylates	BRS, SDC.
Sarcosine	HMP.
All other amino acids and salts, acyclic	IMC, SFS.
All other amino acids and salts, cyclic	AJI, HCC.
Biological stains:	
Biological stains	ALD, EK, MMC.
* Chelating agents, nitriloacids and salts:	
N-alkylamine bismethylenephosphonic acid	DUP.
N-alkylaminobismethylene phosphonic acid salts	X.
Aminotrimethyl phosphonic acid... ..	MYO.
(Diethylenetriamine)pentamethylenephosphonic acid	OMC.
(Diethylenetriamine)pentamethylenephosphonic acid, sodium salt	OMC.
(Diethylenetrinitrilo)pentaacetic acid	CGY, HMP.
(Diethylenetrinitrilo)pentaacetic acid, monosodium hydrogen ferric salt	CGY.
(Diethylenetrinitrilo)pentaacetic acid, pentasodium salt	CGY, HMP, MYO.
(Diethylenetrinitrilo)pentaacetic acid, sodium salt	DOW, WAY.
N,N-Dihydroxyethylglycine, sodium salt	HMP.
Ethanoldiglycine, disodium salt	HMP.
Ethylenediaminetetra(methylene phosphonic acid)	OMC.
Ethylenediaminetetra(methylene phosphonic acid), potassium salt	OMC.
(Ethylene-bis-nitrilo)dimethylene phosphonic acid, potassium salt	OMC.
* (Ethylenedinitrilo)tetraacetic acid	
(Ethylenediaminetetraacetic acid) (EDTA)	CGY, DOW, HMP.
(Ethylenedinitrilo)tetraacetic acid, calcium disodium salt	CGY, DAN, DOW.
(Ethylenedinitrilo)tetraacetic acid, diammonium salt	CGY, DOW.
* (Ethylenedinitrilo)tetraacetic acid, disodium copper salt, dihydrate	
	CGY, HMP, PLC.
* (Ethylenedinitrilo)tetraacetic acid, disodium salt	
	CGY, DOW, HMP.
(Ethylenedinitrilo)tetraacetic acid, disodium zinc salt, dihydrate	CGY, DOW, HMP.
(Ethylenedinitrilo)tetraacetic acid, manganese salt	DOW, HMP.
(Ethylenedinitrilo)tetraacetic acid, monosodium iron salt	CGY, DOW, HMP.
(Ethylenedinitrilo)tetraacetic acid, tetraammonium salt	CGY, DOW.
(Ethylenedinitrilo)tetraacetic acid, tetrapotassium salt	CGY, HMP, X.
* (Ethylenedinitrilo)tetraacetic acid, tetrasodium salt	
	CGY, DOW, HMP, MYO.
(Ethylenedinitrilo)tetraacetic acid, trisodium salt	CGY, TX.
Glucosheptonic acid, β -isomer, sodium salt	BLZ.
Glucosheptonic acid, sodium salt	BLZ, PFN.

SECTION 14. MISCELLANEOUS END-USE CHEMICALS AND CHEMICAL PRODUCTS

Table 43—Continued

Miscellaneous end-use chemicals and chemical products for which U.S. production and/or sales were reported, identified by manufacturer, 1986

<i>Miscellaneous end-use chemicals and chemical products</i>	<i>Manufacturers' identification codes (according to list in table 44)</i>
*Chelating agents, nitriloacids and salts—Continued	
Hexamethylenediaminetetra (methylenephosphonic acid), potassium salt	OMC.
Hydroxyethane-1-diphosphonic acid	BKM, HMP, MYO.
(N-Hydroxyethylethylenedinitrilo) triacetic acid, iron salt	CGY, DOW, HMP.
* (N-Hydroxyethylethylenedinitrilo) triacetic acid, trisodium salt ...	CGY, DAN, DOW, HMP.
Hydroxyethylidene diphosphonic acid, potassium salt	X.
Hydroxyethylidene diphosphonic acid, sodium salt	MYO, X.
Nitriloacetic acid, zinc salt	HMP.
Nitrilotriacetic acid	HMP, MON.
Nitrilotriacetic acid, trisodium salt	HMP.
*Nitrilo-tris-methylene triphosphonic acid	BKM, OMC, X, X.
Nitrilo-tris-methylene triphosphonic acid, potassium salt	X.
Nitrilo-tris-methylene triphosphonic acid, sodium salt	MYO, OMC, X, X.
2-Phosphonobutane-1,2,4-tricarboxylic acid, sodium salt	X.
Polyamine polymethane phosphonic acid	X, X.
Polyamine polymethane phosphonic acid, magnesium salt	RPC.
All other chelating agents, nitriloacids and salts	BKM, HMP, X, X.
Chemical indicators:	
Chemical indicators	ALD, EK, GFS.
*Chemical reagents and fine chemicals:	
*Chemical reagents and fine chemicals	ALD, COC, CO, EK, ESA, GFS, HMY, PAH, PFN, PIC, PLB, REG, RSA, UPJ, UPM, X, X.
*Enzymes:	
Hydrolytic enzymes:	
Amylases:	
*Bacterial amylase	GBF, GNR, MLS, NBI, PMP.
Glucoamylase	GBF, MLS, NBI.
Maltase	PFZ, TX.
All other amylases	GBF, TX.
*Proteases	
Papain	GBF, PFZ.
Pepsin	CHH, SPR.
Protease (bacterial)	MLS, PMP.
*Rennin	CHH, MLS, PFZ.
All other proteases	GBF, GNR, PIC, SPR.
Other hydrolytic enzymes:	
Cholesterol esterase	BCK.
Glucose isomerase	MLS.
Hydrolytic enzyme mixtures	JFR.
Lipase	GBF, GNR.
*Pectinase	GBF, GNR, MLS.
All other hydrolytic enzymes	GNR, MLS, PMP, X.
Non-hydrolytic enzymes:	
Cholesterol oxidase	BCK, UPJ.
Glucose oxidase	BCK, MLS.
Glucose-6-phosphate dehydrogenase	BCK.
Glycerol kinase	BCK.
Uricase	BCK.
*Flotation reagents:	
Allyl N-butyl trithiocarbonate	PLC.
Phosphorodithioates, used as flotation reagents:	
Dicresylphosphorodithiolic acid	ACY.
Dicresylphosphorodithiolic acid, ammonium salt	ACY.
Dicresylphosphorodithiolic acid, sodium salt	KCU.
All other phosphorodithioates used as flotation reagents	ELC.
Rosin amines	HPC.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 43—Continued

Miscellaneous end-use chemicals and chemical products for which U.S. production and/or sales were reported, identified by manufacturer, 1986

<i>Miscellaneous end-use chemicals and chemical products</i>	<i>Manufacturers' identification codes (according to list in table 44)</i>
*Flotation reagents—Continued	
Thiocarbamide (Diphenylthiourea)	ACY.
Xanthates and sulfides, used as flotation reagents:	
Sodium n-butyloxanthate	USR.
Sodium sec-butyloxanthate	ESX.
Xanthates and sulfides	PLC.
All other flotation reagents	DOW, PLC, SHX.
*Fuel additives:	
Diesel fuel additives:	
Hexyl nitrate	DUP, TNA.
All other diesel fuel additives acyclic	TNA.
All other diesel fuel additives cyclic	TNA.
Fuel oil additives:	
Adipic acid-diethylenetriamine-epichlorohydrin polymer	X.
N-sec-Butyl-N-phenylphenylenediamine	UPM.
N,N-Dimethyl-1,3-propanediamine polymer with epichlorohydrin, sulfate	X.
N,N'-Disalicylidene-1,2-propanediamine	DUP, FER, SM, TNA.
Ethoxylated hydantoin glycol dicocotate	GLY.
Formaldehyde polymer with ethylenediamine and nonyl phenol derivatives	X.
Imidazoline from tall oil fatty acids and diethylenetriamine	X.
Mixed aryl diimides	SM.
Phenyl acid phosphate	HDG.
Polybutylether carbamate	SOC.
Poly(dimethylimino(2-hydroxytrimethylene)chloride)	X.
Polyethylenepolyamine polymer with 1,4-dihydroxy-2-butyne	X.
Rust preventing additives	ALX.
Tetrahydropyrimidine from tall oil fatty acids and propylenediamine	X.
All other fuel oil additives, acyclic	DUP, SM, UPM, X.
All other fuel oil additives, cyclic	DUP, PAH.
Gasoline additives:	
N,N'-Di-sec-butyl-p-phenylenediamine	UPM, TNA.
N,N'-Diisopropyl-p-phenylenediamine	DUP, TNA.
Ethylene dibromide	GTL, TNA.
*Methyl-t-butyl ether	ATR, ENJ, GRS, TPC, TUS.
Methylcyclopentadienylmanganese tricarbonyl	TNA.
Tetraethyl lead	DUP, X.
*Tetra(methyl-ethyl)lead, (Tel-tml,reacted)	DUP.
Tetramethyl lead	DUP.
All other gasoline additives, acyclic	TNA, UPM.
*Lubricating oil and grease additives:	
di-t-Amyl acid phosphate	ALW.
Chlorosulfurized and sulfurized compounds:	
Chlorosulfurized lard oil	CCW.
Chlorosulfurized sperm oil	CCW, WBG.
Sulfurized lard oil	CCW, WBG.
Sulfurized sperm oil substitutes	CCW, ELC.
Hydrocarbon carboxylic acid derivatives	X, X.
Hydrocarbon phosphorous acid, barium salt	X.
Hydrocarbon phosphoryl derivatives	X.
Methylene-bridged polyalkyl phenols	TNA, TX.
Oil-soluble petroleum sulfonates:	
Oil-soluble petroleum sulfonate, ammonium salt	NTL.
*Oil-soluble petroleum sulfonate, barium salt	TNA, WTC, X.
*Oil-soluble petroleum sulfonate, calcium salt	SOC, TNA, TX, WTC, X.
Oil-soluble petroleum sulfonate, magnesium salt	WTC, X.
Oil-soluble petroleum sulfonate, sodium salt	PAR, WTC, X.
All other oil-soluble petroleum sulfonates	DAN, DUP, MON, SHC, SOC, WTC.
Oleyl acid phosphate	ALW.
Oxidized hydrocarbon mixture	ALX, FER.

SECTION 14. MISCELLANEOUS END-USE CHEMICALS AND CHEMICAL PRODUCTS

Table 43—Continued

Miscellaneous end-use chemicals and chemical products for which U.S. production and/or sales were reported, identified by manufacturer, 1986

<i>Miscellaneous end-use chemicals and chemical products</i>	<i>Manufacturers' identification codes (according to list in table 44)</i>
*Lubricating oil and grease additives—Continued	
Phenol salts:	
Alkyl phenols	X.
Dodecylphenol, ethylenediamine, formaldehyde polymer, calcium salt	SOC.
Nonylphenol, barium salt	CCA, FER, WTC.
Phenol, salts, all other	TNA.
Phosphorodithioates (Dithiophosphates):	
Alkene thiophosphonate	TX.
Alkyl succinic anhydride	SM, TNA.
Alkyl terephthalamate	SOC.
Bornyl phenylamine	SOC.
Bis(1,3-Dimethylbutyl)phosphorodithioate oleyl amine salt	ELC.
Di-2-ethylhexylphosphorodithiolic acid	ELC.
Di-N-propylphosphorodithiolic acid	ELC.
Zinc dialkyldithiophosphate	ELC, SOC, TNA.
Zinc dialkylphenol dithiophosphate	SOC.
Zinc dibutyl phosphorodithioate	ELC.
Zinc dilsoddecyl phosphorodithioate	ELC.
Zinc hydrocarbon dithiophosphate	X.
All other phosphorodithioates used as lubricating oil and grease additives.	TX, X.
Succinimides:	
Alkenyl succinimide	SOC, TNA, VTC.
Dodecyl-oleyl succinimide	SM.
Dodecyl-acetic succinimide	SM.
All other succinimides	TNA.
Sulfur compounds:	
Aliphatic hydrocarbon sulfides	ELC, FER, SOC, TNA, X.
Chlorosulfurized cresylic acids	CCW.
Diisobutylene polysulfide	TNA, TX.
Di-tertiary nonylpolysulfide	PAS.
Triisobutylene polysulfide	TX.
All other sulfur compounds	WTC, X.
All other lubricating oil and grease additives:	
Di-2-ethylhexylphosphorodithiolic acid	ELC.
Diisopropyl hydrogen phosphite	SM.
Dimer acid esters and polyesters	EMR.
Dodecyl succinic acid, benzotriazole salt	SM.
Dodecylphenyl- α -naphthylamine	SM.
Dodecylphenyl- α -naphthylamine, dioctyl diphenyl- amine copolymer	SM.
Fatty acid polyamine condensate	SOC.
Mixed polyesters	HCC.
Pentaerythritol esters	HCC.
1,3,4-Thiadiazole, 2,5-bis(dialkyldithio) derivatives	ELC.
All other lubricating oil and grease additives, acyclic	DUP, ELC, QCP, SM, TNA, X.
All other lubricating oil and grease additives, cyclic	CGY, ENJ, SM, TNA, X.
*Paint driers, naphthenic acid salts:	
Cadmium naphthenate	CCA, VNC.
*Calcium naphthenate	CCA, MCI, NOD, TRO.
Chromium naphthenate	MCI.
*Cobalt naphthenate	CCA, MCI, NOD, SHP, TRO.
Copper naphthenate	NOD.
*Iron naphthenate	CCA, MCI, NOD.
Lead naphthenate	CCA, MCI, NOD, SHP.
Lithium naphthenate	CCA.
*Manganese naphthenate	CCA, MCI, NOD, SHP, SM.
Naphthenate driers, mixed salts	MCI.
Rare earths naphthenate	CCA, NOD.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 43—Continued

Miscellaneous end-use chemicals and chemical products for which U.S. production and/or sales were reported, identified by manufacturer, 1986

Miscellaneous end-use chemicals and chemical products	Manufacturers' identification codes (according to list in table 44)
*Paint driers, naphthenic acid salts—Continued	
Strontium naphthenate	CCA.
Zinc naphthenate	CCA, MCI, NOD, SHP, TRO.
All other paint driers, naphthenic acid salts	SHP.
*Photographic chemicals:	
2-Amino-5-mercapto-1,3,4-thiadiazole	FMT.
Aryl alkyl polyether alcohol	DIX.
5-Chlorobenzotriazole	FMT.
3-Chloro-4-diethylaminobenzenediazonium chloride (p-Diazo-2-chloro-N,N-diethylaniline zinc chloride)	ESA.
Chlorohydroquinone	ESA.
1-Diazo-2,5-diethoxymorpholinobenzene	ALL, ESA.
2,5-Diethoxy-4-morpholinobenzenediazonium chloride	ALL, ESA.
2,5-Diethoxy-4-morpholinobenzenediazonium sulfate	ALL.
*p-Diethylaminobenzenediazonium chloride (p-Diazo-N,N-diethylaniline zinc chloride)	ALL, ESA, FMT.
p-Dimethylaminobenzenediazonium chloride (p-Diazo-N,N-dimethylaniline zinc chloride)	ALL, ESA.
p-Diphenylaminediazonium sulfate	FMT.
p-(N-Ethylbenzimidazo)benzenediazonium chloride (p-Diazo-N-benzyl-N-ethylaniline)-zinc chloride	ESA.
p-[Ethyl (2-hydroxyethyl)amino]benzenediazonium chloride (p-Diazo-N-hydroxyethylaniline zinc chloride)	ESA.
(N-Ethyl-N-(2-hydroxyethyl)-3-methyldehydrogen sulfate)p-phenylenediamine	X.
N-Ethyl-N-hydroxyethyl-p-phenylenediamine sulfate	WAY.
N-Ethyl-N-(β-methane sulfonamidoethyl)toluene-2,5-diaminesulfate	X.
Hydroquinone (Hydroquinol)	EKT.
p-[(2-Hydroxyethyl)methylamino]benzenediazonium chloride (p-Diazo-N-hydroxyethyl-N-methylaniline)-zinc chloride	ESA.
4-Hydroxymethyl-4-methyl-1-phenyl-3-pyrazolidone	X.
2-Hydroxynaphthol ethylamide	FMT.
4-Methoxy-1-naphthol	X.
p-Methylaminophenol sulfate (Metol)	EK.
2-Methylbenzoxazole	FMT.
5-Methyl-1,7-dihydroxy-1,3,4-triazalindolizine	FMT.
4,4-Methyldene-bis-1(p-sulfophenyl)3-methylpyrazolone	FMT.
4-((3-Methyl-5-oxo-1-(4-sulfophenyl)-2-pyrazolin-4-ylidene)methylene)-3-methyl-1-(4-sulfophenyl)-2-pyrazolin-5-one	DUP.
2-Methylthiazoline	FMT.
p-Morpholinyl-2,5-dibutoxybenzene diazonium chloride	ALL.
6-Nitrobenzimidazole	FMT.
5-Nitrobenzimidazole nitrate	EK.
1-Phenyl-3-pyrazolidone	CWN.
Poly(vinyl-O-sulfobenzal)	DUP.
4-N-(1-Pyrrolidyl)-m-toluenediazonium chloride	ALL, ESA.
All other photographic chemicals	DUP, EK, ESA, FMT, WAY, X, X, X.
*Polymers for fibers:	
Cellulose acetate	CEL, EKT, MIL.
Copolyurethane urea	DUP.
Linear saturated polyester	EKT.
*Nylon 6 and 6/6:	
Nylon 6 (Polymer for fiber, only)	ACS.
Nylon 6/6	DUP, MON.
*Polyacrylonitrile and acrylonitrile copolymers	
*Polyethylene terephthalate	
Poly-m-phenylene isophthalamide	ACY, BKM, DUP, MON, SFS.
Poly-p-phenylene terephthalamide	CEL, DUP, EKT, FRF, GYR.
All other polymers for fibers	DUP.
	DUP.
	HST.

SECTION 14. MISCELLANEOUS END-USE CHEMICALS AND CHEMICAL PRODUCTS

Table 43—Continued

Miscellaneous end-use chemicals and chemical products for which U.S. production and/or sales were reported, identified by manufacturer, 1986

<i>Miscellaneous end-use chemicals and chemical products</i>	<i>Manufacturers' identification codes (according to list in table 44)</i>
*Polymers, water soluble:	
*Acrylamide polymers and copolymers:	
Acrylamide-2-acrylamido-2-methylpropanesulfonic acid, sodium salt polymer	MRK, X.
Acrylamide-acrylic acid copolymer	CHP.
Acrylamide-acrylic acid copolymer, sodium salt	BKM, SNW.
Acrylamide N-dimethylaminomethylacrylamide copolymer	BKM.
Adipic acid-crosslinked polyacrylamide	BKM, CIN, ENJ, HPC.
Polyacrylamide	SNW.
Polyacrylamide dimethylammonium ethyl methacrylate	SNW.
All other polyacrylamide copolymers	X.
*Cellulose esters and ethers:	
Cationic cellulose ether	UCC.
Hydroxyethylcellulose	CRN, DOW, UCC, X.
Methylcellulose	DOW.
Sodium carboxymethylcellulose (100%)	CBC, LCS, MAK, X.
All other cellulose ethers and esters	S, X.
Dimethylamine epichlorohydrin ethylenediamine copolymer	CPS, X.
Ethyl acrylate methacrylic acid copolymer	ALC.
Hydroxypropyl guar gum	RPC.
*Polyacrylic acid salts:	
Ammonium polyacrylate	ENJ, X, X, X.
Polyacrylate methacrylate copolymers	BFG, CRN, X, X.
*Sodium ammonium polyacrylate and copolymers	ALC, BFG, X, X.
Sodium polyacrylate	BKM, DOW, ENJ, SYT, X, X.
All other polyacrylic acid salts	ACY, MYO, S, X, X.
Polyacrylonitrile, hydrolyzed	DIX.
Polyacrylonitrile, starch hydrolyzed polymer	GPC.
Polyamines	ENJ, X.
Polydextrose	PFZ.
Poly(diallyldimethylammonium) chloride	CPS, MRK, X.
Polymethacrylic acid, sodium salt	ALC, CPS.
Poly(1,1'-(methylimino)bis(3-chloro-2-propanol)-tetramethylethylenediamine	BKM.
Sodium carboxymethyl amylose	CCL.
Vinyl acetate maleic copolymer, sodium salt	X.
1-Vinyl-2-pyrrolidone, polymers	CCL, DAN, GAF, UCC, X.
Xanthan gum	PFZ.
All other polymers, water soluble	EFH, RPC, STC, SYT, X, X, X, X, X.
Polyalphaolefins:	
Poly- α -olefins	SM, TNA.
Poly- α -olefins, sulfurized	SM.
Rare sugars:	
l-Arabinose	PFN.
D-Galactose	PFN.
D-Maltose	PFN.
Silicone greases:	
Silicone greases	DCC, SPD, SWS.
*Tanning materials, synthetic:	
2-Naphthalenesulfonic acid, formaldehyde condensate and salt	GRD.
Polyoxyalkylated cyclic amines	MIL.
*Textile chemicals, other than surface-active agents:	
4,4'-bis(2-Benzoxazolyl)stibene	EKT.
N,N-bis-(2-Hydroxyethyl)octadecanamide	CCC.
N,N-Dibenzylhydroxylamine	CCC.
Dicyanodiamide formaldehyde ammonium chloride polymer	CCC, CRJ, DAN.
Diethylenetriamine, triethylphosphate, urea polymer, stearate	CCC.
*Dimethyloldihydroxyethylene urea	ACY, CCC, CHP, DAN.
Formaldehyde polymer with carbamate esters	SYT.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 43—Continued

Miscellaneous end-use chemicals and chemical products for which U.S. production and/or sales were reported, identified by manufacturer, 1986

<i>Miscellaneous end-use chemicals and chemical products</i>	<i>Manufacturers' identification codes (according to list in table 44)</i>
*Textile chemicals, other than surface-active agents—Continued	
Hydrogenated tallow fatty acid aminoethylethanolamine condensation products	CCC.
Melamine formaldehyde methanol polymer	ACY, CCC, CRT, PAT.
Melamine formaldehyde triethanolamine mixed fatty alcohols polymer	RPC.
Melamine stearyl alcohol polymer	SYT.
Propoxylated starches	SYT.
Urea, 2-(2-aminoethyl)aminoethanol polymer, stearate	CCC.
*Urea polymers with formaldehyde and methanol	ACY, CCC, CRT, SYT.
Urea, polymer with tetrakis(hydroxymethyl)phosphonium sulfate	CHP.
All other textile chemicals, other than surface-active agents	ACR, CCC, CIN, DAN, ENJ, PAT, RPC, SFS.
Urea, by end-use markets:	
Urea, primary solution (Report on 100% urea-content basis)	APD, ARM, BNP, BOR, CAC, CFI, CHN, CNC, FRI, GCC, HKY, MSC, OMC, PLC, SMP, SOC, SOH, TER, TRI, TVA, UOC, WLC, WYC, X.
*Urea in compounds or mixtures (100% Basis):	
*Urea in feed compounds (100% Basis)	APD, BNP, CAC, SOH, TER, TRI, WYC.
*Urea in liquid fertilizer (100% Basis)	ARM, BNP, CFI, CHN, CNC, FRI, HKY, MSC, PLC, SMP, SOC, SOH, TER, TRI, TVA, UOC, X.
Urea in plastics (100% Basis)	BOR, OMC, SOH, TRI.
*Urea in solid fertilizer (100% Basis)	APD, CAC, CFI, CNC, FRI, GCC, MSC, OMC, SOH, TER, TRI, TVA, UOC, WLC, WYC, X.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

SECTION 14. MISCELLANEOUS END-USE CHEMICALS AND CHEMICAL PRODUCTS

Table 44

Miscellaneous end-use chemicals and chemical products alphabetical directory of manufacturers by code, 1986

(Names of manufacturers that reported production and/or sales of miscellaneous end-use chemicals to the U.S. International Trade Commission for 1986 are listed below in the order of their identification codes as used in table 43)

<i>Code</i>	<i>Name of company</i>	<i>Code</i>	<i>Name of company</i>
ACR	CPC International, Inc., Acme Resin Corp.	ELC	Elco Corp. Sub. of Detrex Chemical Industries, Inc.
ACS	Allied Signal, Inc., Engineered Materials Sector	EMR	Emery Chemicals Div. of National Distillers & Chemical Corp.
ACY	American Cyanamid Co.	ENJ	Exxon Chemical Americas
AJI	Ajinomoto USA, Inc.	ESA	East Shore Chemical Co.
ALC	Alico Chemical Corp.	ESX	Essex Chemical Corp., Essex Industrial Chemicals, Inc.
ALD	Aldrich Chemical Co., Inc.		
ALL	Alliance Chemical, Inc.		
ALW	Albright & Wilson, Inc.		
ALX	Alox Corp.	FER	Ferro Corp.: Ferro Chemical Div. Kell Chemical Div.
APD	Atlas Powder Co., Sub. of Tyler Corp.	FMT	Fairmount Chemical Co., Inc.
ARM	LaRoche Industries Inc.	FRF	Firestone Tire & Rubber Co., Firestone Fibers & Textiles Co.
ATR	Atlantic Richfield Co., Arco Chemical Co.	FRI	Farmland Industries, Inc.
BCK	Beckman Instruments, Inc.		
BFG	B.F. Goodrich Co., B.F. Goodrich Chemical Group	GAF	GAF Corp., Chemical Group
BKM	Buckman Laboratories, Inc.	GBF	Gist-Brocades U.S.A. Inc.
BLZ	Belzak Corp.	GCC	W.R. Grace & Co., Agricultural Chemicals Group
BOR	Borden, Inc., Borden Chemical Div.	GFS	G. Frederick Smith Chemical Co.
BNP	Bison Nitrogen Products Co.	GLY	Glyco, Inc.
BRS	Bristol-Myers Co.	GNR	Genencor, Inc.
		GPC	Grain Processing Corp.
CAC	Cominco Fertilizers Inc.	GRD	W.R. Grace & Co., Polymers & Chemical Div.
CBC	Carbose Corp.	GRS	Champlin Petroleum Co.
CCA	Interstab Chemicals, Inc.	GTL	Great Lakes Chemical Corp.
CCC	C.N.C. International, Inc.	GYR	Goodyear Tire & Rubber Co.
CCL	Catawba-Charlab, Inc.		
CCW	Morton-Thiokol, Inc., Carstab Div.	HCC	Hatco Chemical Corp.
CEL	Celanese Engineering Resins, Inc., Operations	HDG	Hodag Chemical Corp.
CFI	CF Industries, Inc.	HKY	Hawkeye Chemical Co.
CGY	Ciba-Geigy Corp.	HMP	W.R. Grace & Co., Hampshire Chemical Div.
CHH	CHR Hansen's Laboratory, Inc.	HMY	Humphrey Chemical Co.
CHN	N-REN Corp., Cherokee Nitrogen Div.	HPC	Hercules, Inc.
CHP	C.H. Patrick & Co., Inc.	HST	American Hoechst Corp., Hoechst Fiber Industries Div.
CHT	Chattem, Inc.		
CIN	Stockhausen, Inc.	IMC	International Minerals & Chemicals Corp., Industrial Chemicals Div.
CNC	Columbia Nitrogen Corp.		
CO	Conoco Specialty Products, Inc.	JFR	George A. Jeffreys & Co., Inc.
COC	Columbia Organic Chemicals Co., Inc.	LCS	Louisiana Chemical Specialties, Inc.
CPS	CPS Chemical Co., Inc.	LEM	Napp Chemicals, Inc.
CRN	CPC International, Inc., Amerchol Corp.	MAK	MAK Chemical Corp.
CRT	Chemos Corp.	MCI	Mooney Chemicals, Inc.
CRZ	Crown Zellerbach Corp.	MCK	MacKenzie Chemical Works, Inc.
CWN	Upjohn Co., Fine Chemicals	MIL	Milliken & Co., Milliken Chemical Co.
DAN	Dan River, Inc., Chemical Products Div.	MLS	Miles Laboratories, Inc., Biotechnology Group
DCC	Dow Corning Corp.	MON	Monsanto Co.
DGC	Degussa Corp.	MRK	Merck & Co., Inc.
DIX	Dixie Chemical Co., Inc.	MSC	Mississippi Chemical Corp.
DOW	Dow Chemical Co.	MYO	Mayo Chemical Co.
DUP	E.I. duPont de Nemours & Co., Inc. Chemicals and Pigments Dept.. Textile Fibers Dept. Photosystems and Electronics Dept.	NBI	Novo Biochemical Industries, Inc.
EFH	E.F. Houghton Co.	NOD	Nuodex, Inc.
EK	Eastman Kodak Co.:	NSW	NutraSweet Co.
EKT	Tennessee Eastman Co. Div.		

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 44—Continued

Miscellaneous end-use chemicals and chemical products alphabetical directory of manufacturers by code, 1986

<i>Code</i>	<i>Name of company</i>	<i>Code</i>	<i>Name of company</i>
NTL	NL Industries, Inc.	SNW	Sun Chemical Corp., Chemical Div.
OMC	Olin Corp.	SOC	Chevron Corp., Chevron Chemical Co.
PAH	Parish Chemical Co.	SOH	Standard Oil Chemical Co.
PAR	Pennzoil Co., Penreco Div.	SPD	General Electric Co., Silicone Products Dept.
PAT	Pat-Chem Inc.	SPR	Scientific Protein Laboratories
PAS	Pennwalt Corp.	STC	American Hoechst Corp., Sou-Tex Works
PFN	Pfanstiehl Laboratories, Inc.	SWS	Stauffer Chemical Co., Stauffer-Wacker Silicone Div.
PFZ	Pfizer, Inc.	SYT	Synthron, Inc.
PIC	Pierce Chemical Co.	TER	Terra International, Inc.
PLB	Pharmacia P-L Biochemicals, Inc.	TER	Terra Nitrogen, Inc.
PLC	Phillips Petroleum Co.	TNA	Ethyl Corp.
PMP	PMP Fermentation Products, Inc.	TPC	Texas Petrochemical Corp.
PPG	PPG Industries, Inc.	TRI	Triad Chemical
QCP	Quaker Chemical Corp.	TRO	Troy Chemical Corp.
REG	Regis Chemical Co.	TUS	Texaco Butadiene Co.
RH	Rohm & Haas Co.	TVA	Tennessee Valley Authority
RPC	Millmaster Onyx Group, Inc., Lyndall Chemical Co. Div.	TX	Texaco, Inc., Texaco Chemical Co.
RSA	R.S.A. Corp.	UCC	Union Carbide Corp.
S	Sandoz, Inc., Colors & Chemicals Div.	UOC	Union Oil Co. of California
SCP	Henkel Corp.	UPJ	Upjohn Co.
SDC	Sandoz Chemical Corp.	UPM	U.O.P. Inc.
SFS	Stauffer Chemical Co., Specialty & Chemicals Group	USR	Uniroyal, Inc., Uniroyal Chemical Div.
SHP	Shepherd Chemical Co.	VNC	Vanderbilt Chemical Corp.
SHX	Sherex Chemical Co., Inc.	WAY	Olin Hunt Specialty Products, Inc.
SM	Mobil Oil Corp., Mobil Chemical Co., Chemical Products Div.	WBG	White & Bagley Co.
SMP	J. R. Simplot Co.	WLC	Agrico Chemical Co.
		WTC	Witco Chemical Corp.
		WYC	Wycon Chemical Co.

Note.—Complete names, telephone numbers, and addresses of the above reporting companies are listed in app. A.
Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

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SYNTHETIC ORGANIC CHEMICALS, 1986

SECTION 15. MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS

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The term "miscellaneous chemicals" as it is used here comprises those synthetic organic products that are not included in the use groups covered by sections I–XIV of this report. They include products that are employed in a great variety of uses. The number of chemicals used extensively for only one purpose is not large. Among the products covered in this section are those used for refrigerants, aerosols, solvents, catalysts, and a wide range of chemical intermediates.

Figure 16 shows the trend of production of miscellaneous chemicals during 1982–86, and shows there has been a considerable increase since the low point in 1982. However, the 1986 production of 95.7 billion pounds was little more than the 95.0 billion pounds produced in 1981, and was considerably smaller than the all-time peak of 98.8 billion pounds produced in 1979.

U.S. production of miscellaneous cyclic and acyclic chemicals in 1986 amounted to 95.7 billion pounds, an increase of 1.9 percent compared with production in 1985 (table 45). Production of miscellaneous cyclic chemicals constituted only 2.8 percent of this section's total production.

Because most of the production of miscellaneous chemicals is used internally by their producers to make more advanced intermediates and other chemical products, their sales are much smaller than their production. In 1986, sales of miscellaneous chemicals were 37.9 billion pounds, valued at \$10.8 billion, compared with 36.4 billion pounds, valued at \$11.2 billion, in 1985. The increase in sales quantity in 1986 was 4.1 percent. However, mainly because of the decrease in prices of crude oil and other petrochemical raw materials, sellers reduced the prices of many miscellaneous chemicals. This and a changed product mix resulted in an average unit value in 1986 for miscellaneous chemicals which was 7 percent lower than in 1985, with the result that the total value of sales in 1986 was 3.3 percent less than in 1985. Oxygenated hydrocarbons accounted for 59 percent of the production of all acyclic miscellaneous chemicals. Production of oxygenated hydrocarbons, which include organic acids, alcohols (the largest group), ketones, esters, ethers, aldehydes, epoxides, and other chemicals, increased from 54.6 billion pounds in 1985 to 55.6 billion pounds in 1986, or by 1.8 percent.

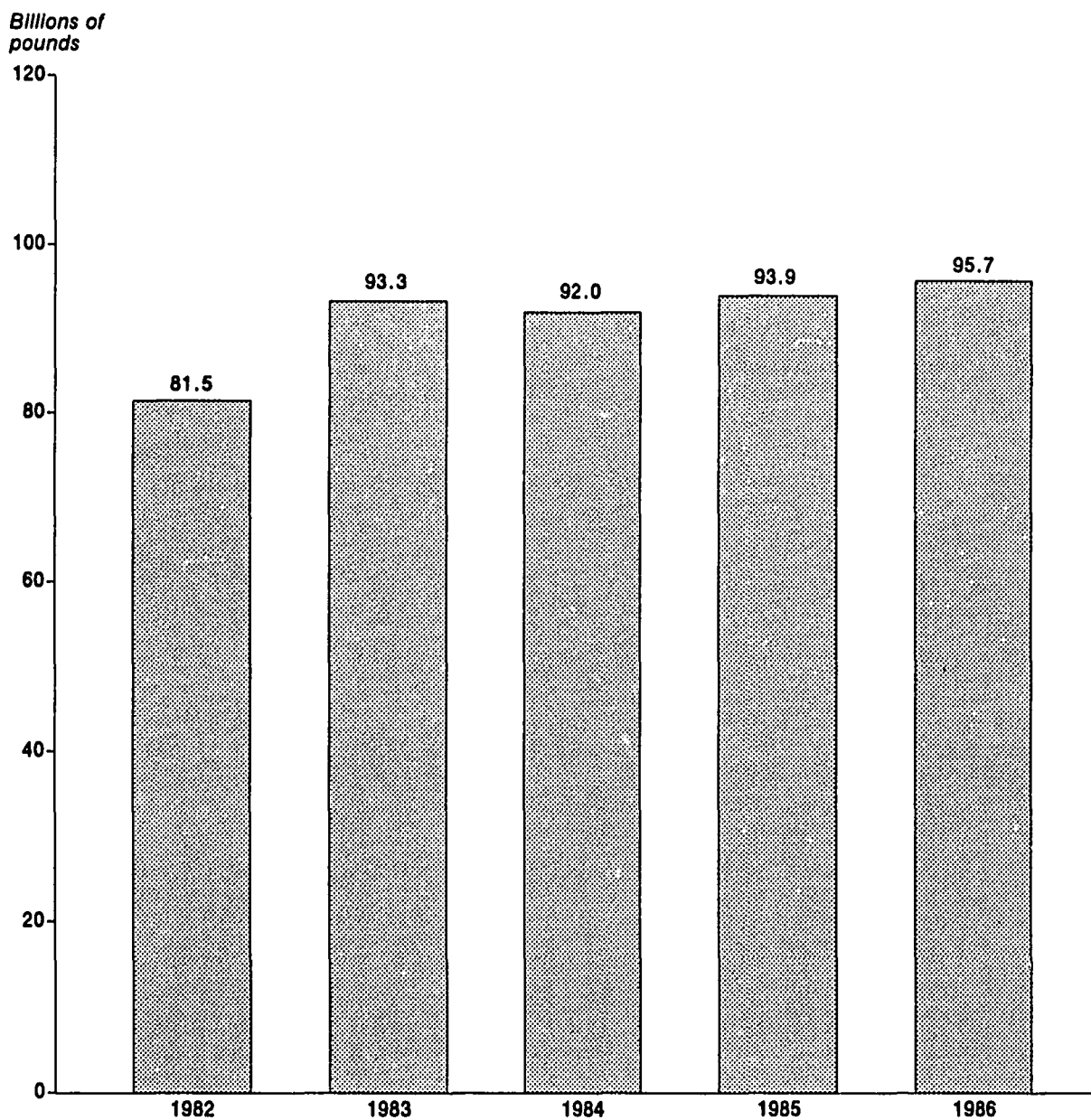
The largest individual group of miscellaneous acyclic chemicals is the halogenated hydrocarbons. Production of halogenated hydrocarbons was almost 27 billion pounds in 1986, about the same as in 1985. Production of chlorinated hydrocarbons, by far the largest segment of this group, was 25.7 billion pounds in 1986, compared with 25.8 billion pounds, in 1985. The insignificant overall change in this group in 1985–86 hides large changes in many of its constituent chemicals. There was increased production of methylene chloride (up 100 million pounds), chloroform (up 147 million pounds), and ethylene dichloride (up 840 million pounds); balanced by decreased production of vinyl chloride (down more than 1 billion pounds), perchloroethylene (down 264 million pounds), 1,1,1-trichloroethane (down 217 million pounds), and "all other" (i.e., unpublished because of business confidentiality requirements) chlorinated hydrocarbons (down 308 million pounds). Fluorinated hydrocarbons production was 1.14 billion pounds in 1986, up 11.8 percent compared with production in 1985.

The second largest individual group of miscellaneous acyclic chemicals is monohydric alcohols, production of which was 13.5 billion pounds in 1986, an increase of 13 percent from 1985. Compared with 1985, the increase of 2.2 billion pounds of methanol far outweighed decreases of production of 700 million pounds of butyl alcohols and 900 million pounds of synthetic (i.e., non-fermentation) ethyl alcohol.

Table 46 lists the products reported in this section and indicates the manufacturer(s) of each by code. These codes are identified by company name in table 47.

SECTION 15. MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS

Figure 16
Miscellaneous cyclic and acyclic chemicals



Source: U.S. International Trade Commission, *Synthetic Organic Chemicals: United States Production and Sales*.

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SYNTHETIC ORGANIC CHEMICALS, 1986

Table 45

Miscellaneous cyclic and acyclic chemicals: U.S. production and sales, 1986

(Listed below are all miscellaneous cyclic and acyclic chemicals for which any reported data on production or sales may be published. (Leaders (...)) are used where the reported data are accepted in confidence and may not be published or where no data were reported.) Table 46 lists all miscellaneous cyclic and acyclic chemicals for which data on production and/or sales were reported and identifies the manufacturers of each)

<i>Miscellaneous cyclic and acyclic chemicals</i>	<i>Sales</i>			
	<i>Production</i> 1,000 pounds	<i>Quantity</i> 1,000 pounds	<i>Value</i> 1,000 dollars	<i>Unit value¹</i> Per pound
Grand total	95,665,617	37,929,871	10,809,388	\$0.28
Cyclic				
Total	2,715,490	1,166,368	1,040,156	.89
Benzoic acid salts, total	24,074	21,363	20,838	.98
Potassium benzoate	4,098	4,097	3,598	.88
All other benzoic acid salts	19,116	17,266	17,240	1.00
Benzoyl peroxide	8,529	8,119	19,420	2.39
Butyl benzoate	1,008	1,216	703	.58
tert-Butyl peroxybenzoate	4,273	4,177	8,032	1.92
Caprolactam	1,108,899	...	...	...
Hexamethylenetetramine, tech. grade	76,108	...	...	...
Lactones	91,211	16,691	17,310	1.04
Maleic anhydride	359,372	302,230	132,360	.44
Pinene and derivatives, total	319,874	...	...	...
β-Pinene	50,883	...	...	...
All other	268,991	46,591	16,505	.35
Succinic anhydride derivatives	17,903	16,355	15,148	.93
Tall oil salts (Linoleic-rosin acid salts)	3,255	...	...	...
All other	700,984	749,626	809,840	1.08
Acyclic				
Total	92,950,127	36,763,503	9,769,232	.27
Nitrogenous compounds				
Total	8,495,640	2,810,877	1,177,862	.42
Amides, total	259,989	141,183	120,962	.86
Acrylamide monomer	47,184	...	...	...
N,N'-Ethylenebis-oleamide	517	433	498	1.15
N,N'-Ethylenebis-stearamide	46,068	29,127	18,647	.64
Oxamide	90	80	630	7.85
All other	166,130	111,543	101,187	.91
Amines, total²	1,560,035	484,717	353,931	.73
Butylamines, total	19,737	21,190	15,160	.72
Di-n-butylamine	3,459	4,047	3,077	.76
All other butylamines	16,278	17,143	12,083	.70
Diethylamine .....	...	5,377	4,090	.76
Dipropylamine .....	...	25,081	16,034	.64
Triethylamine .....	...	18,677	14,219	.76
Ethylenediamine	66,328	51,542	39,527	.77
Isopropylamine, mono- .....	...	59,065	23,948	.41
Methylamines, total	111,957	...	...	...
Dimethylamine	50,802	...	...	...
Methylamine, mono-	37,134	...	...	...
Trimethylamine	24,021	...	...	...
All other	1,362,013	303,785	240,953	.79

See footnotes at end of table.

SECTION 15. MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS

Table 45—Continued

Miscellaneous cyclic and acyclic chemicals: U.S. production and sales, 1986

<i>Miscellaneous cyclic and acyclic chemicals</i>	<i>Sales</i>			
	<i>Production</i>	<i>Quantity</i>	<i>Value</i>	<i>Unit</i>
	<i>1,000</i> <i>pounds</i>	<i>1,000</i> <i>pounds</i>	<i>1,000</i> <i>dollars</i>	<i>Per</i> <i>pound</i>
Nitrogenous compounds—Continued				
Ethanolamines, total	542,758	473,561	124,843	\$0.26
2,2'-Aminodiethanol (Diethanolamine)	176,988	160,583	41,361	.26
2-Aminoethanol (Monoethanolamine)	209,099	155,103	40,366	.26
2,2',2''-Nitrilotriethanol (Triethanolamine)	156,671	157,875	43,116	.27
Methyl diethanolamine (2,2'-(Methylimino)diethanol) ..	15,447	13,183	13,461	1.02
Nitriles, total	4,565,528	1,522,832	384,573	.25
Acetonitrile	26,473	...	...	...
Acrylonitrile ..	2,181,633	1,284,949	331,164	.26
2-Methylacetonitrile (Acetone cyanohydrin)	1,081,900	...	...	...
All other	1,275,522	237,883	53,409	.22
All other	1,551,883	175,401	180,092	1.03
Acids, acyl halides and anhydrides				
Total	8,404,644	2,300,127	802,329	.35
Acetic acid, synthetic, 100 ^o	2,728,301	864,960	103,424	.12
Acrylic acid ^o	970,019	168,934	66,140	.39
Dimer acid (C ₂₆ Dibasic acid)	26,912	...	...	...
2-Ethylhexanoyl chloride	1,768	...	...	...
Fatty acids, hydrogenated and nonhydrogenated	276,620	242,420	59,193	.24
Fumaric acid .....	...	28,162	16,951	.60
Pivaloyl chloride	1,389	...	...	...
Propionic acid .....	...	75,509	15,951	.21
All other	4,399,635	920,142	540,670	.59
Salts of organic acids				
Total	407,135	282,445	207,964	.74
Acetic acid salts, total	47,725	19,867	14,141	.71
Potassium acetate	1,977	1,972	1,346	.68
Sodium acetate	40,850	12,756	6,085	.48
Zinc acetate	465	448	729	1.63
All other	4,433	4,691	5,981	1.28
Calcium neodecanoate	143	90	141	1.57
Calcium propionate	22,636	22,246	8,964	.40
2-Ethylhexanoic acid (α-Ethylcaproic acid) salts, total	20,904	16,756	23,886	1.43
Calcium 2-ethylhexanoate	2,382	2,297	2,138	.93
Cobalt 2-ethylhexanoate	5,235	4,057	9,003	2.22
Lead 2-ethylhexanoate	816	750	677	.90
Manganese 2-ethylhexanoate	1,343	1,241	1,116	.90
Zinc 2-ethylhexanoate	923	636	697	1.10
Zirconium 2-ethylhexanoate	3,981	2,935	4,631	1.58
All other	6,224	4,840	5,624	1.16
Oxalic acid salts, total .....	...	74	208	2.79
Ammonium oxalate .....	...	34	101	2.95
Potassium oxalate .....	...	28	69	2.45
All other oxalic acid salts .....	...	12	38	3.11
Sodium citrate	52,303	...	...	...
Sodium propionate	2,671	2,756	1,306	.47

See footnotes at end of table.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 45—Continued

Miscellaneous cyclic and acyclic chemicals: U.S. production and sales, 1986

<i>Miscellaneous cyclic and acyclic chemicals</i>	<i>Production</i> 1,000 <i>pounds</i>	<i>Sales</i>		<i>Unit</i> <i>value</i> ¹ <i>Per</i> <i>pound</i>
		<i>Quantity</i> 1,000 <i>pounds</i>	<i>Value</i> 1,000 <i>dollars</i>	
Acyclic—Continued				
Salts of organic acids—Continued				
Stearic acid salts, total ⁴ .....	...	108,702	70,607	\$0.65
Aluminum distearate	898	904	989	1.09
Aluminum tristearate	484	470	554	1.18
Barium stearate	2,039	1,145	929	.81
Cadmium stearate	769	692	1,099	1.59
Calcium stearate	58,734	58,094	27,090	.47
Magnesium stearate	6,593	6,742	6,838	1.01
Zinc stearate	26,069	26,205	21,775	.83
All other stearic acid salts .....	...	14,450	11,333	.78
All other	165,167	111,954	88,711	.79
Aldehydes				
Total	8,429,489	2,253,610	203,897	.09
Butyraldehyde	1,470,655	...	...	...
Formaldehyde (37% by weight)	5,549,417	1,887,016	112,795	.06
Propionaldehyde	281,650	9,163	2,062	.23
All other	1,127,767	357,431	89,040	.25
Ketones				
Total	2,842,313	2,297,771	485,103	.21
Acetone, total				
From cumene	1,558,197	1,235,198	204,510	.17
Crude .....	...	...	...	...
From isopropyl alcohol	351,509	...	...	...
4-Hydroxy-4-methyl-2-pentanone (Diacetone alcohol) .....	...	22,559	10,325	.46
Methyl ethyl ketone (2-Butanone)	600,440	606,808	128,641	.21
4-Methyl-2-pentanone (Methyl isobutyl ketone)	142,610	148,316	50,114	.34
All other	189,557	284,890	91,513	.32
Alcohols, monohydric, unsubstituted				
Total	13,494,433	6,850,449	1,120,731	.16
Alcohols, C₁₁ or lower, unmixed, total				
Butyl alcohols, total	2,089,072	...	...	...
n-Butyl alcohol (n-Propylcarbinol) ⁵	880,610	516,791	102,922	.20
Isobutyl alcohol (Isopropylcarbinol) ⁵	181,240	115,736	18,460	.16
All other	1,027,222	...	...	...
Ethyl alcohol, synthetic ⁶	529,436	697,757	182,404	.26
2-Ethyl-1-hexanol	571,335	405,012	102,047	.25
Isopropyl alcohol ⁷	1,300,544	995,547	183,028	.18
Methanol, synthetic ³	7,205,074	2,743,139	135,278	.05
Propyl alcohol (Propanol)	175,558	94,863	28,501	.30
All other	637,055	742,507	129,684	.17
Alcohols, C ₁₂ and higher, unmixed, total	172,083	67,216	38,847	.58
Mixtures of alcohols, total				
Containing C ₁₁ or lower only	814,276	471,881	199,560	.42
Containing C ₁₂ through C ₁₈	108,028	95,300	32,469	.34
Other mixtures	492,140	309,415	146,176	.48
All other	214,110	67,166	20,915	.31

See footnotes at end of table.

SECTION 15. MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS

Table 45—Continued

Miscellaneous cyclic and acyclic chemicals: U.S. production and sales, 1986

<i>Miscellaneous cyclic and acyclic chemicals</i>	<i>Sales</i>			
	<i>Production</i>	<i>Quantity</i>	<i>Value</i>	<i>Unit</i>
	<i>1,000</i> <i>pounds</i>	<i>1,000</i> <i>pounds</i>	<i>1,000</i> <i>dollars</i>	<i>Per</i> <i>pound</i>
Acyclic—Continued				
Esters of monohydric alcohols				
Total	4,699,184	2,862,039	1,039,207	\$0.36
Allyl methacrylate	980	930	1,410	1.52
n-Butyl acetate	179,155	149,315	44,503	.30
Isobutyl acetate	75,754	59,221	14,918	.25
Butyl acrylate	489,289	242,667	102,952	.42
tert-Butyl peroxyvalerate	2,300	3,229	7,910	2.45
Dibutyl maleate	2,834	3,041	1,686	.55
Di-2-ethylhexyl maleate	2,979	...	...	...
Dilauryl-3,3'-thiodipropionate	2,265	2,464	3,813	1.55
Dioctyl maleate	2,465	2,634	1,388	.53
Distearyl-3,3'-thiodipropionate	2,250	...	...	...
2-Ethoxyethyl acetate	84,082	79,880	31,890	.40
Ethyl acetate (100% basis)	198,051	174,691	37,506	.21
Ethyl acrylate	306,181	159,531	59,862	.38
2-Ethyl-1-hexyl acrylate	89,005	76,450	36,363	.48
Fatty acid esters, not included with plasticizers or surface-active agents, total	16,575	16,354	7,719	.47
Tridecyl stearate	694	350	316	.90
All other	15,881	16,004	7,403	.46
Lauryl methacrylate .....	...	1,053	1,680	1.60
Methyl methacrylate ^a	943,317	295,260	134,180	.45
Phosphorus acid esters, not elsewhere specified	116,540	95,457	110,005	1.15
Propyl acetate	60,600	57,671	23,680	.41
Stearyl methacrylate .....	...	275	383	1.39
Vinyl acetate	1,710,310	1,188,114	245,380	.21
All other	414,252	253,802	171,979	.68
Polyhydric alcohols^a				
Total	6,471,328	4,131,472	1,025,531	.25
1,4-Butanediol	373,012	102,394	66,628	.65
Ethylene glycol ^b	4,770,876	3,003,204	534,755	.18
Pentaerythritol ^b	119,517	116,415	57,361	.49
Propylene glycol	573,013	543,693	164,989	.30
Sorbitol (70% by weight)	185,827	133,621	48,362	.36
All other	449,083	232,145	153,436	.66
Polyhydric alcohol esters				
Total	216,651	212,708	137,311	.65
2-(2-Butoxyethoxy)ethyl acetate .....	...	8,128	3,809	.62
2-Butoxyethyl acetate .....	...	17,852	10,643	.60
All other .....	...	188,728	122,859	.65
Polyhydric alcohol ethers				
Total	1,869,011	1,479,031	493,165	.33
2-Butoxyethanol (Ethylene glycol monobutyl ether) ..	302,979	292,932	78,846	.27
2-(2-Butoxyethoxy)ethanol (Diethylene glycol monobutyl ether)	82,441	73,628	26,434	.36
2-[2-(2-Butoxyethoxy)ethoxy]ethanol (Triethylene glycol monobutyl ether)	12,702	6,929	2,919	.42
Diethylene glycol	489,590	362,118	53,086	.15

See footnotes at end of table.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 45—Continued

Miscellaneous cyclic and acyclic chemicals: U.S. production and sales, 1986

<i>Miscellaneous cyclic and acyclic chemicals</i>	<i>Production</i> 1,000 pounds	<i>Sales</i>		<i>Unit</i> <i>value</i> ¹ Per pound
		<i>Quantity</i> 1,000 pounds	<i>Value</i> 1,000 dollars	
Acyclic—Continued				
Polyhydric alcohol ethers—Continued				
Diethylene glycol dimethyl ether (Bis(2-methoxyethyl)ether)	3,003	2,894	4,111	1.42
Dipropylene glycol	59,772	48,973	14,237	\$0.29
2-Ethoxyethanol (Ethylene glycol monoethyl ether) ..	121,808	56,267	28,026	.50
2-(2-Ethoxyethoxy)ethanol (Diethylene glycol monoethyl ether)	27,636	26,215	8,814	.34
2-[2-(2-Ethoxyethoxy)ethoxy]ethanol (Triethylene glycol monoethyl ether)	14,681	9,288	4,525	.49
2-Methoxyethanol (Ethylene glycol monomethyl ether)	79,849	74,650	21,040	.28
2-(2-Methoxyethoxy)ethanol (Diethylene glycol monomethyl ether)	39,073	40,495	13,085	.32
2-[2-(2-Methoxyethoxy)ethoxy]ethanol (Triethylene glycol monomethyl ether)	29,645	...	...	...
Polyethylene glycol dimethyl ether	13,663	11,286	5,907	.52
Polyglycols, ethylene glycol and glycol ether, mixed	27,878	...	...	...
Polypropylene glycol	20,250	9,633	5,737	.60
Tetraethylene glycol	18,407	20,489	8,625	.32
Triethylene glycol	107,131	104,722	28,812	.28
All other	418,503	338,512	190,961	.56
Brominated, chlorinated, and fluorinated hydrocarbons				
Total	26,839,278	8,345,541	1,934,369	.23
Brominated (including bromochlorinated) hydrocarbons	21,145	10,460	12,997	1.24
Chlorinated hydrocarbons, total	25,678,528	7,408,254	1,203,563	.16
Carbon tetrachloride	626,972	495,866	68,872	.14
Chlorinated paraffins (C ₁₀ -C ₃₀):				
35%-64% chlorine	76,237	73,762	28,438	.39
65% or more chlorine	24,369	18,938	8,432	.45
Chloroform ³	422,415	416,421	82,118	.20
Chloromethane (Methyl chloride)	604,659	...	...	...
Dichloromethane (Methylene chloride) ³	566,406	519,169	89,043	.17
Ethyl chloride (Chloroethane) ³	163,501	106,820	16,333	.15
Ethylene dichloride (1,2-Dichloroethane)	12,940,258	787,882	65,784	.08
Tetrachloroethylene (Perchloroethylene)	414,039	484,683	78,781	.16
1,1,1-Trichloroethane (Methyl chloroform)	652,109	659,387	191,096	.29
Vinyl chloride, monomer (Chloroethylene)	8,439,083	3,409,209	456,851	.13
All other	748,480	436,117	117,815	.27
Fluorinated (including other fluorohalogenated) hydrocarbons, total	1,139,605	926,827	717,809	.77
Chlorodifluoromethane (F22)	270,968	192,881	197,278	1.02
Dichlorodifluoromethane (F12)	322,344	326,080	195,685	.60
Trichlorofluoromethane (F11)	201,935	190,923	88,630	.46
All other	344,358	216,963	236,216	1.09
All other miscellaneous acyclic chemicals				
Total	10,622,139	2,793,632	1,118,204	.40
Acyclic peroxides, total	45,660	25,849	47,924	1.85
2-Butanone peroxide	13,513	12,438	19,558	1.57
Di-tert-butyl peroxide	3,024	3,012	4,384	1.46

See footnotes at end of table.

SECTION 15. MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS

Table 45—Continued

Miscellaneous cyclic and acyclic chemicals: U.S. production and sales, 1986

<i>Miscellaneous cyclic and acyclic chemicals</i>	<i>Production</i>	<i>Sales</i>		<i>Unit value¹</i>
		<i>1,000</i>	<i>Quantity</i>		Value
	<i>pounds</i>	<i>1,000</i>	<i>1,000</i>	<i>Per</i>
		<i>pounds</i>	<i>dollars</i>	<i>pound</i>
Acyclic—Continued				
All other miscellaneous acyclic chemicals—Continued				
Acyclic peroxides—Continued				
All other	29,123	10,399	23,982	\$2.30
Expoxides, ethers, and acetals, total	8,051,287	2,035,765	529,050	.26
Ethylene oxide ²	5,429,645	567,963	116,524	.21
1-Butoxy-2,3-epoxypropane (Butyl glycidyl ether) .	583	558	1,055	1.89
All other	2,621,079	1,467,244	411,471	.28
Fats and oils, chemically modified	37,171	37,152	18,768	.51
Hydrocarbons	18,367	19,518	11,794	.60
Organo-aluminum compounds .....	...	29,983	53,966	1.80
Organo-boron compounds .....	...	862	2,729	3.17
Organo-silicon compounds, total⁷	489,825	127,025	281,009	2.21
Silicone fluids	110,152	85,337	181,350	2.13
All other	379,673	41,688	99,659	2.39
Organo-tin compounds .....	...	27,397	80,785	2.95
Phosgene (Carbonyl chloride)	844,839	...	...	...
Sodium methoxide (sodium methylate) .....	...	6,835	3,706	.56
All other	1,134,990	483,446	88,473	.18
Mixtures not specifically itemized				
Total	158,882	143,801	23,559	.16

¹ Calculated from unrounded figures.

² Statistics exclude production and sales of fatty amines. Statistics on fatty amines are included in the section "Surface-Active Agents."

³ The difference between the production reported here and that shown on the Preliminary Report on U.S. Production of Selected Organic Chemicals (Including Synthetic Plastics and Resin Materials, 1986, results from a combination of incorrect reporting by some companies, end-of-year inventory adjustments, and rounding.

⁴ Statistics exclude production and sales of potassium and sodium stearates. Statistics on these stearates are included in the section "Surface-Active Agents."

⁵ Statistics for production of specially denatured alcohol, 208.4 million wine gallons, and completely denatured alcohol, 198.4 million wine gallons, for calendar year 1986 are compiled from data supplied by the Bureau of Alcohol, Tobacco, and Firearms. Withdrawals of completely denatured alcohol were 242.8 million wine gallons, of which 94 percent were used for fuel. (These withdrawals included imported alcohol.)

⁶ Some polyols which are used as intermediates for urethanes have been included in the section "Plastics and Resin Materials."

⁷ Statistics exclude production and sales of silicone resins (see "Plastics and Resin Materials" section), silicone elastomers (see Elastomers section), and silicone greases (see "Miscellaneous End-Use Chemicals and Chemical Products" section).

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 46

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were reported, identified by manufacturers, 1986

(Chemicals for which separate statistics are given in table 45 are marked below with an asterisk (*); chemicals not so marked do not appear in table 45 because the reported data are accepted in confidence and may not be published. Manufacturers' identification codes shown below are taken from table 47. An "X" signifies that the manufacturer did not consent to his identification with the designated product)

<i>Miscellaneous chemicals</i>	<i>Manufacturers' identification codes (according to list in table 47)</i>
Cyclic	
6-Acetoxy-2,4-dimethyl-1,3-dioxane	GIV.
Alkylphenol formaldehyde condensate, alkoxylated	X.
Alkylphenol formaldehyde copolymer	X.
Aminoethyl piperazine	DOW, UCC.
1-(3-Aminopropyl)morpholine	TX.
Amyl p-dimethylaminobenzoate	VND.
1-Aza-3,7-dioxo-5-ethyl bicyclooctane	EFH.
*Benzolic acid salts:	
Ammonium benzoate	WTK.
Barium benzoate	FER, WTC.
Cadmium benzoate	VNC, WTC.
*Potassium benzoate	KLM, PFZ, SOL.
Sodium benzoate, U.S.P.	HCP, JRC, KLM, PFZ.
Sodium benzoate, tech	PFZ.
All other benzoic acid salts	SOL.
Benzenephosphinic acid	SFS.
Benzenephosphonic acid	SFS.
1,4-Benzoquinone (p-Quinone)	EKT.
Benzothiazole	RCI.
Benzotriazole, substituted	CGY, X.
*Benzoyl peroxide	AZT, CAD, NOC, PLC, WTC, WTL.
Benzyl alcohol	KLM, SFS.
Benzyl chloroformate	ESX, VCM.
Bis(p-chlorobenzoyl)peroxide	CAD.
Bis(2,4-dichlorobenzoyl) peroxid	CAD, WTL.
Bis(α, α -dimethylbenzyl)peroxid	WTL.
2,2-Bis(ferrocenyl)propane	X.
Bis(hydroxymethyl)oleyl oxazoline	ANG.
1,1-Bis(3,3,5-trimethyl)dicyclohexane	WTL.
Bis(triphenylsilyl)chromate	X.
Boron fluoride-phenol complex	ACS.
Bromochloro-5,5'-dimethyl hydantoin	GLY.
β -Bromo- β -nitrostyrene	GIV.
2-Butoxyethyl benzoate	X.
Butylated hydroxyanisole	UPM.
*Butyl benzoate	MRF, PCI, TCC, UTC.
4-tert-Butylcyclohexyl peroxydicarbonate	CAD.
tert-Butylhydroquinone	EKT.
Butyl and isopropyl phthalimides	RPC.
2 (and 3)-tert-Butyl-4-methoxyphenol (BHA)	EKT.
Butyl morpholine	TX.
*tert-Butyl peroxybenzoate	AZT, FRE, WTC, WTL.
tert-Butyl peroxy-3,5,5-trimethyl cyclohexane	CAD.
4-tert-Butylpyrocatechol	CRZ.
Camphene	SCM.
*Caprolactam (2-Oxohexamethylenimine)	ACS, BAS, CNP.
Caprolactam magnesium bromide	X.
Cellulose acetate hexahydrophthalate	X.
Cellulose acetate phthalate	EK.
1-(3-Chloroallyl)-3,5,7-triazo-1-azoniaadamantane chloride	DOW.
Chlorothioxanthone	PSG.
Cresolsulfonic acid, formaldehyde condensate	STC.
Cumene hydroperoxide	BTL, FRE, MON.
α -Cumyl peroxyneodecanoate	WTL, WTC.
Cyanuric acid	DOW.
Cyclohexanethiol	PAS.

SECTION 15. MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS

Table 46—Continued

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were reported, identified by manufacturers, 1986

<i>Miscellaneous chemicals</i>	<i>Manufacturers' identification codes (according to list in table 47)</i>
Cyclic—Continued	
*Benzoic acid salts—Continued	
2-Cyclohexene-1-octanoic acid, 5 (and 6)-carboxy-4-hexyl, C ₂₁ H ₃₆ O ₄	WVA.
Cyclohexylamine	RBC.
1,4-Cyclohexylenedimethanol	CPS, EKT.
Cyclo chloroacetate	AAC.
Cyclopropane	DOW.
Cyclopropane carboxylic acid chloride	COC.
Decabromodiphenyl ether (DBDP)	GTL, TNA.
Decahydronaphthalene (Decalin)	DUP.
Dehydroacetic acid or sodium salt	GAN.
Diamino cyclohexane	CXI.
4,4-Diaminodiphenyl ether	MAL.
3,3-Diaminodiphenyl sulfone	RBC.
1,4-Diazobicyclo(2.2.2)octane	X.
Diazodinitrophenol	HPC.
2,5-Di(benzoyl peroxy)-2,5-dimethylhexane	AZT, WTL.
Dibutoxy acetophenone	CWN.
Di-t-butyl diperoxyphthalate	WTL.
2,5-Di-tert-butylhydroquinone	EKT.
2,4-Di-t-butyl phenyl 3,5-di-t-butyl hydroxybenzoate	FER.
1,3-Dichloro-5,5-dimethylhydantoin	GLY.
4,4'-Dichloro-3-(trifluoromethyl)carbanilide	CGY.
Dicumyl peroxide	FRE.
1,1-Dicyclohexane	WTL.
Dicyclopentadienylchromium	X.
Diethoxyphenyl acetophenone	CWN.
Diethyl cyclohexylamine	AIP.
N,N'-Diethyl-N,N'-diphenylurea	VCM.
Di(2-ethylhexyl)chloroendate	VEL.
1,5-Diethyl-2-thio-4,6-pyrimidinedione	TNI.
2,5-Dihydrothiophene-1,1-dioxide (Sulfolene)	PLC.
Dihydroxydimethyl benzophenone	CWN.
3,5-Dihydroxy-3,5-dimethyl-1,2-peroxycyclopentane	WTL.
Dilodomethyl-p-tolyl sulphone	ABB.
Diisopropylbenzene hydroperoxide	HPC.
Diketene	EKT.
p-Dimethoxybenzene (Dimethyl ether of hydroquinone)	ASL.
N,N'-Dimethyl-N,N'-diphenylurea	VCM.
4,4-Dimethyl oxazolidine	EFH.
4,4-Dimethyl oxazoline	ANG.
Dimethyl piperazine	TX.
Dimorpholine diethyl ether	TX.
4,4-Dinitrocarbanilide-4,6-dimethyl-2-pyrimidinol	MRK.
Di-n-octadecyl-3,5-ditertbutyl-4-hydroxyphenyl phosphonate	VAL.
Dioxane (1,4-Diethylene oxide)	FER, MIL.
1,3-Dioxolane	FER.
Diphenyl-2-ethylhexyl phosphite	WTC.
Diphenylisodecyl phosphite	WTC.
Diphenylisooctyl phosphite	WTC.
Dipropylene glycol salicylate	SBC.
4-(Dodecyloxy)-2-hydroxybenzophenone	EKT.
6-Ethoxy-12-dihydro-2,2,4-trimethyl quinoline	MON.
2,6-Di-tert-butyl-p-cresol (BHT):	
2,6-Di-tert-butyl-p-cresol, (BHT), food grade	USR.
2,6-Di-tert-butyl-p-cresol, (BHT), technical grade	UCC, USR.
2-Ethylhexyl benzoate	TCC.
2-Ethylhexyl-p-dimethylaminobenzoate	CWN, VND.
Ethyl hydroxymethyl oleyl oxazoline	ANG.
Ethylidene norbornene	UCC.
4-Ethylmorpholine	TX.
Ferrocene polymer with 2-propanone, in chlorinated wax	X.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 46—Continued

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were reported, identified by manufacturers, 1986

<i>Miscellaneous chemicals</i>	<i>Manufacturers' identification codes (according to list in table 47)</i>
Cyclic—Continued	
Furan derivatives:	
2-Furaldehyde (Furfural)	QKO.
Tetrahydrofurfuryl alcohol	QKO.
Glyceryl p-aminobenzoate	VND.
Hexabromocyclodecane	TNA.
*Hexamethylenetetramine, tech	BOR, HMP, NOD, PLS, WCL.
Homomenthyl salicylate	WTC, X.
Hydrindantin	PIC.
Hydroquinone, di(β -hydroxyethyl) ether	EKT.
p-Hydroxybenzoic acid, benzyl ester	LEM.
p-Hydroxybenzoic acid, butyl ester	EK, KLM.
p-Hydroxybenzoic acid, ethyl ester	KLM.
p-Hydroxybenzoic acid, methyl ester	KLM, LEM.
p-Hydroxybenzoic acid, propyl ester	KLM, LEM.
N-(Hydroxyethyl)piperazine	TCH, UCC.
2-Hydroxy-4-methoxybenzophenone	GLY.
Hydroxymethyl-5,5-hydantoin	GLY.
α -D-p-Hydroxyphenylglycine methyl ester K	BOC.
4-Hydroxy-2,2,6,6-tetramethyl-1-piperidinyloxy	EK.
1,2,3-Indantrione monohydrate (Ninhydrin)	PIC.
*Lactones:	
Butyrolactone	BAS, GAF.
Caprolactone	UCC.
Glucono- δ -lactone	PFZ.
All other lactones	PFN.
Lanolin acetate	CRN.
Lanolin acid	CRN.
Lanolin acid, isopropyl ester	CRN.
Lanolin alcohol acetate	CRN.
*Maleic anhydride	AMO, ASH, DKA, MON, USS.
8-p-Menthyl hydroperoxide	HPC.
4-Methoxyphenol	ASL, EKT.
Methylbenzene sulfonate	EK.
Methy-p-benzoquinone	EK.
2-Methylcyclohexylamine	AIP.
2,2'-Methylenebis(3,4,6-trichlorophenol) (Hexachlorophene)	VEL, ZOC.
4-Methylmorpholine	TX.
4-Methylphthalic anhydride	SFA.
1-Methyl-2-pyrrolidone, monomer	BAS, GAF.
Morpholine	AIP, DOW, TX.
Morpholine salt of p-toluene sulfonic acid	AMB.
N-Nitrosophenylhydroxylamine salt	MAL.
Octabromodiphenyl oxide	TNA.
Octadecyl-3-(3,5-di-tert-butyl-4-hydroxyphenyl)-propionate	CGY, TNA.
2-Octanyhydroquinone	EKT.
Oxalyl bis(benzylidene hydrazide)	EKT.
Pentaerythritol tribenzoate	VEL.
Phenethyl bromide	WCC.
Phenolglycol ethers	UCC.
2-Phenoxyethanol (Ethylene glycol monophenyl ether)	TCH.
2-(2-Phenoxyethoxy)ethanol (Diethylene glycol phenyl ether)	EKT.
Phenyldisodecyl phosphite	WTC.
Phenyldimethyl urea	RBC.
Phenylglycidyl ether	WLN.
α -D-Phenylglycine methyl ester K	BOC.
1-Phenyl-2-hydroxy-2-methyl-propanone-l	CWN.
Phenyl xylyl ethane	HCC, TCC.
Phthalic acid, lead salt, (Dibasic)	ALI.
Picramic acid, sodium salt	SDC.

SECTION 15. MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS

Table 46—Continued

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were reported, identified by manufacturers, 1986

<i>Miscellaneous chemicals</i>	<i>Manufacturers' identification codes (according to list in table 47)</i>
Cyclic—Continued	
*Pinene and derivatives:	
Pinane	SCM.
Pinane hydroperoxide	SCM.
2-Pinanol (cis and trans)	SCM.
α-Pinene	ARZ, SCM.
α-Pinene epoxide	SCM.
*β-Pinene	ARZ, HPC, NCI, SCM.
Pinene, sulfate	ARZ, HPC, NCI.
Pinene, wood	HPC.
Pine oil, natural sulfate	NCI.
Pine oil, synthetic	ARZ, SCM.
Propylene glycol dioenzoate	VEL.
Propyl gallate	EKT.
p-Quinone	EKT.
Resorcinol monobenzoate	EKT.
Salicylic acid magnesium salt	KLM.
Sodium benzene phosphinate	SFS.
Stannous octyl phthalate	X.
Styrene oxide	UCC.
Succinic anhydride	BCC.
*Succinic anhydride derivatives:	
Dodecylsuccinic anhydride	BCC, DIX, MIL.
Dodecylsuccinic anhydride	HMY.
n-Hexadecylsuccinic anhydride	DIX, HMY.
Hexenylsuccinic anhydride	HMY.
Iso-Hexadecenyl succinic anhydride	HMY.
Iso-Octadecenyl succinic anhydride	HMY.
Octadecenyl succinic anhydride	MIL.
Octenyl succinic anhydride	HMY, MIL.
Nonenylsuccinic anhydride	HMY.
n-Tetradecenylsuccinic anhydride	DIX.
Sucrose benzoate	VEL.
Tall oil, chemically modified	CCC, FOC, EFH, GAF, WVA, X, X, X.
Tall oil fatty acids, polymerized	WVA.
*Tall oil salts (Linoleic-rosin acid salts):	
Cadmium tallate	WTC.
Calcium manganese tallate	MCI, SHP.
Calcium tallate	X.
Cobalt manganese tallate	MCI.
Cobalt tallate	MCI, SHP.
Lead manganese tallate	SHP.
Lead tallate	MCI.
Manganese tallate	MCI, SHP.
Zinc tallate	MCI.
All other tall oil salts (Linoleic-rosin acid salts)	CCA, CIN, SHP, X.
Terephthaloyl chloride	ABB, WCC.
Tannic acid, N.F.	MAL.
Terpene hydrocarbons, monocyclic (Solvenol)	HPC, NCI, SCM, WTK.
Terpene polymers	ARZ.
Tetrabromobisphenol A	GTL, TNA, X.
1,2,3,4-Tetrahydronaphthalene (Tetralin)	DUP.
Tetrahydrothiophene	PAS.
Tetrahydrothiophene-1,1-dioxide (Sulfolane)	PLC, SHC.
Thiobis(methyltertiarybutyl phenol)	CRZ.
Thiophene	PAS.
Triallyl cyanurate	ACY.
1,2,4-Triazole	OMC.
Tributyltin benzoate	COS.
3,4,4'-Trichlorocarbanilide	MON.
1,3,5-Trichloro-s-triazine-2,4,6-(1H,3H,5H)trione (Trichloroisocyanuric acid)	MON, OMC.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 46—Continued

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were reported, identified by manufacturers, 1986

<i>Miscellaneous chemicals</i>	<i>Manufacturers' identification codes (according to list in table 47)</i>
Cyclic—Continued	
*Tall oil salts (Linoleic-rosin acid salts)—Continued	
Tri(2,4-ditertiarybutylphenyl)phosphite	WTC.
Trimethyl-1-cyclohexane	ENJ.
3,3,5-Trimethylcyclohexanol (m-homomenthol)	ARS.
3,5,5-Trimethyl-2-cyclohexene-1-one (isophorone)	UCC.
2,4,6-Trinitroresorcinol and lead derivative	REM.
2,4,6-Triphenoxy-s-triazine	AMB.
Triphenyl phosphite	WTC.
Triphenyltin hydroxide	X.
Vinylbenzyl chloride	DOW.
1-Vinyl-2-pyrrolidinone-other copolymers	GAF.
1-Vinyl-2-pyrrolidinone-maleic anhydride copolymer	GAF.
1-Vinyl-2-pyrrolidinone-methylacrylic acid, dimethylamine ethyl ester, copolymer	GAF.
1-Vinyl-2-pyrrolidinone, monomer	GAF.
1-Vinyl-2-pyrrolidinone-vinyl acetate copolymer	GAF.
All other cyclic chemicals	AIP, ALW, CED, CPS, CWN, FTX, GAF, GP, NES, ORT, PAC, PCI, PD, PIC, PLC, REG, REM, RH, RSA, S, SFS, STC, TCC, TNA TX, UCC, VIK, WLN, WTC, WTL, X, X, X, X.
Acyclic	
*Nitrogenous compounds:	
Acetamidoethanol (N-Acetyl-ethanolamine)	GAF, SBC.
Alkyl C ₁₂ -C ₁₄ amine hydrochloride	COS.
*Amides:	
Acetamide	WTK.
*Acrylamide monomer	ACY, DOW, SOH, X.
Acrylamide polymer, modified	X.
Amido amine salts as curing agents	PAC, REZ, X.
1,1'-Azobisformamide	FMT, OMC, USR.
Behemamide	WTC.
Bis[2-(octadecylamido)ethyl]-N-(2-cyanoethyl)-N- ethyl ammonium ethyl sulfate	SBC.
N-Bromoacetamide	REG.
N-Coco-γ-hydroxybutyramide	COC.
Coconut oil amide	ARC, CAD.
2,2-Dibromo-3-nitropropionamide	DOW.
N,N-Diethyldodecanamide	EK, X.
N,N-Dimethylacetamide	DUP, MON.
N,N-Dimethylacetoacetamide	EKT.
Dimethylaminopropyl methacrylamide	TX.
Dimethyl caprylamide capramide	HAL.
N,N-Dimethylformamide	AIP, DUP, HAL.
Erucamide	ARC, WTC.
Erucamide-stearamide mix	WTC.
N,N'-Ethylenebis(cocoamide)	WTC.
*N,N'-Ethylenebis-oleamide (Oleic acid- ethylenediamine condensate (Amine/acid ratio =1/2))	CCW, GLY, WTC.
*N,N'-Ethylenebis(stearamide)	CCW, GLY, WTC.
Fish oil fatty acid amide	WTC.
Formaldehyde adduct condensation	COS.
N-(Hydroxymethyl)-formamide	X.
Methacrylamide	DUP.
N-Methylacetamide	ARS, EKT.
Oleamide (Octadecene amide)	ARC, WTC.
Oleoylpalmitamide	HXL, WTC.
Oxamide	HML, TLI, X.
Stearamide (Octadecane amide)	ARC, WTC.
Stearyl erucamide	HXL, WTC.
Stearyl stearamide	WTC.
Tallow amide, hydrogenated	ARC, CAD.

SECTION 15. MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS

Table 46—Continued

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were reported, identified by manufacturers, 1986

<i>Miscellaneous chemicals</i>	<i>Manufacturers' identification codes (according to list in table 47)</i>
Acyclic—Continued	
*Nitrogenous compounds—Continued	
*Amides—Continued	
Triethylene diamide	TX.
All other amides	ARC,ARS,BRD,EFH,RBC, SOL, WTC, WTK.
Adipic acid-diethylenetriamine condensate	EFH.
*Amines:	
Allylamines	
Bis-hexamethylenetriamine amine	SHC, VGC.
	DUP, MON.
*Butylamines:	
n-Butylamine, mono	AIP, PAS, VGC.
sec-Butylamine, mono	FER, PAS.
tert-Butylamine, mono	MON.
Di-n-butylamine	AIP, PAS, VGC.
Dibutylamine	AIP, VGC.
Tri-n-butylamine	AIP, PAS.
n-Butylethylamine	AIP.
Di-tert-butylethyldiamine	VGC.
Diethylenetriamine	TX, UCC.
Diisopropylamine	AIP, UCC, VGC.
Dimethylaminopropylamine	AIP, TX.
N,N-Dimethylbutylamine	VGC.
Ethylamines:	
Diethylamine	AIP, PAS, UCC, VGC.
Ethylamine, mono	AIP, PAS, UCC, VGC.
*Triethylamine	
	AIP, PAS, UCC, VGC.
*Ethylenediamine	
(2-Ethylhexyl)amine, mono	DOW, TX, UCC.
N-Ethyl-2-methylallylamine	VGC.
Fatty amines	
1,6-Hexanediamine (Hexamethylenediamine)	VGC.
n-Hexylamine	NCI.
*Isopropylamine, mono	DUP, MON.
Methylamines:	
*Dimethylamine	CXI, PAS.
*Methylamine, mono	AIP, UCC, VGC.
*Trimethylamine	
n-Octylamine	AIP, DUP, GAF, IMC.
tert-Octylamine	AIP, DUP, GAF, IMC.
Pentaethylenehexamine	AIP, DUP, GAF, IMC.
Pentylamines (Amylamines):	
Dipentylamine	VGC.
Pentylamine, mono	RH.
Tripentylamine	DOW, UCC.
Poly(oxypropylene)diamine	
1,2-Propanediamine (Propylenediamine)	PAS, VGC.
Propylamines:	
*Dipropylamine	PAS.
Propylamine, mono	PAS.
Tripropylamine	TX.
Tetraethylenepentamine	AIP.
N,N,N',N'-Tetramethyl-1,3-butanediamine	AIP, PAS, VGC.
Tetramethylethylenediamine	AIP, PAS, VGC.
Trialkylamine	AIP, PAS.
Triethylenetetramine	DOW, UCC.
All other amines	MON, UCC.
2-Amino-1-butanol	BKM.
2-Amino-2,3-dimethylbutane	RH.
2-Aminoethanol hydrochloride	DOW, UCC.
2-Aminoethanol (Monoethanol amine) sulfite	EK, MON, PAC, VEL, X.
Aminoethoxyethanol	ANG.
2-(2-Aminoethylamino)ethanol (Aminoethylethanolamine)	NES.
2-Aminoethyl mercaptoacetate (Monoethanolaminethioglycolate)	OMC.
2-Amino-2-ethyl-1,3-propanediol	EVN, OMC.
	TX.
	DOW, UCC.
	EVN.
	ANG.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 46—Continued

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were reported, identified by manufacturers, 1986

<i>Miscellaneous chemicals</i>	<i>Manufacturers' identification codes (according to list in table 47)</i>
Acyclic-Continued	
*Nitrogenous compounds—Continued	
Aminoguanidine hydrochloride	REM.
2-Amino-2-(hydroxymethyl)-1,3-propanediol (Tris(hydroxymethyl)aminomethane	ANG, WTK.
3-Amino-3-methyl-1-butene	RH.
2-Amino-2-methyl-1,3-propanediol	ANG.
2-Amino-2-methyl-1-propanol	ANG.
2-Amino-2-methyl-1-propanol hydrochloride	CCC.
Bis(dimethylaminoethyl) ether	TX.
tert-Butylaminoethyl methacrylate	AAC, CPS.
tert-Butyldiethanolamine	PAS, UCC.
1-Butyl-3-ethyl-2-thiourea	PAS.
2-Chloro-N,N-diethylethylamine hydrochloride	SOL.
2-Chloro-N,N-dimethylethylamine (Dimethylamino ethyl chloride) hydrochloride	SOL.
Choline	RH, X.
1-(2-Cyanoethyl)ethyl urea	GAF.
Di-amine derivatives of dimer acids	SCP.
2-Dibutylaminoethanol	PAS.
Dibutylaminomethanol	X.
1,3-Dibutyl-3-thiourea	RBC.
2-Diethylaminoethanol (N,N-Diethylethanolamine)	PAS, UCC.
2-(2-Diethylaminoethoxy)ethanol	PAS, UCC.
2-Diethylaminoethyl acrylate	X.
Diethylaminoethylacrylate, dimethyl sulfate, quaternary salt	CPS.
2-Diethylaminoethyl methacrylate	CPS, DUP.
Diethylcarbonyl chloride	GAF.
Diethylglycolamine (DEGA)	AIP.
Diethylhydroxylamine	PAS.
1,3-Diethyl-2-thiourea	PAS, RBC.
2-Diisopropylaminoethanol (N,N-Diisopropylethanol-amine)	PAS, UCC.
Diisopropylcarbodiimide	RBC.
Dimethylamine epichlorohydrin copolymer	X.
2-Dimethylaminoethanol hydrochloride	EVN.
2-Dimethylaminoethanol (N,N-Dimethylethanolamine)	PAS, PEL, TX, UCC.
Dimethylaminoethylacrylate, methyl chloride, quaternary salt	CPS.
Dimethylaminoethyl methacrylate	AAC, CPS.
Dimethylaminomethylmethacrylate, dimethyl sulfate, quaternary salt	AAC, CPS.
Dimethylaminoethylmethacrylate, methyl chloride, quaternary salt	AAC, CPS.
Dimethylaminomethanol	X.
2-Dimethylamino-2-methyl-1-propanol hydrochloride	WPG.
1-(Dimethylamino)-2-propanol	ANG, PAS, PEL.
Dimethylaminopropylamine, propoxylated	TX.
1,1-Dimethylhydrazine	USR.
Dimethylisopropanolamine	UCC.
2,5-Dithiobiurea	FMT, GAF.
tert-Dodecylsuccinamide	GAF.
*Ethanalamines:	
^a Diethanolamine (2,2'-Aminodiol)	DOW, ICI, OMC, TX, UCC.
^a Monoethanolamine (2-Aminoethanol)	DOW, ICI, OMC, TX, UCC.
^a Triethanolamine (2,2',2''-Nitrioltriethanol)	DOW, ICI, OMC, TX, UCC.
2-Ethylaminoethanol (Ethylmonoethanolamine)	PAS.
Ethylenediamine dihydrochloride	RSA.
1,1-Ethylenediurea	EK.
5-(N-Ethyl-N-hydroxyethylamino)-2-pentanone	SDW.
N-Ethyl-N-hydroxyethyl-1,4-pentanediamine	SDW.
2-Ethyl-2-nitro-1,3-propanediol	ANG.
Hexamethylenediamine adipate (Nylon salt)	DUP, MON, X.
Hexylamine ethoxylate	CXI.

SECTION 15. MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS

Table 46—Continued

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were reported, identified by manufacturers, 1986

<i>Miscellaneous chemicals</i>	<i>Manufacturers' identification codes (according to list in table 47)</i>
Acyclic—Continued	
*Nitrogenous compounds—Continued	
2-(Hydroxymethyl)-2-nitro-1,3-propanediol (Tris-(hydroxymethyl)nitromethane)	ANG.
Iminodiacetic acid	HMP.
Isopropylamines:	
Monoisopropylamine	DOW.
Diisopropylamine	DOW.
Trisopropylamine	DOW.
2-Isopropylaminoethanol	PAS.
Ketimine, tetrafunctional	PAC, SM.
3-Methoxypropylamine	TX.
2-Methylaminoethanol (N-Methylethanolamine)	PAS, UCC.
Methyl-2-aminothiopropan-3-carboxylate	NES.
Methyl carbamate	NSC.
Methyl hydrazine	OMC.
*2,2'-(Methylimino)diethanol (Methyldiethanolamine)	DOW, PAS, TX, UCC.
Methyl isocyanate	UCC.
2-Methyl-2-nitro-1-propanol	ANG.
Mixed higher glycolamine (MHGA)	AIP.
Nitrated lard oil	SM.
*Nitriles:	
*Acetonitrile	BKC, DUP, SOH, X.
*Acrylonitrile, monomer	ACY, DUP, MON, PLC, SOH.
Adiponitrile	DUP, MON.
Aminodimethyl butyronitrile	KF.
2,2'-Azobis[2-methylpropionitrile] (Azobisisobutyronitrile)	DUP.
n-Butyronitrile	EKX.
Coconitrile	ARC.
Crotonitrile	RBC.
Cyanoacetic acid (Malonic nitrile)	KF.
3-Ethoxypropionitrile	DIX.
Ethyl cyanoacetate	KF.
Hexadecanenitrile	ARC, WTC.
Isobutyronitrile	EKX.
Lactonitrile	MON.
Lauronitrile (Dodecyl nitrile)	JTO.
3-Methoxypropionitrile	X.
Methyl cyanoacetate	KF.
Methylisobutyl ketone aminonitrile	HMP.
*2-Methylactonitrile (Acetone cyanohydrin)	CYR, DUP, RH, SOH.
Nitrilotriacetone nitrile	HMP.
Olefin nitrile (Octadecene nitrile)	ARC.
Pentenenitrile	DUP.
Propionitrile	MON.
Stearonitrile (Octadecane nitrile)	ARC, WTC.
Tallow nitrile	ARC, WTC.
Tallow nitrile, hydrogenated	WTC.
3,3'-Thiodipropionitrile	EVN.
Vinylacetonitrile	ARC, RBC.
All other nitriles	DUP, OMC, RSA, WTC, X.
Nitroethane	ANG.
Nitromethane	ANG.
1-Nitropropane	ANG.
2-Nitropropane	ANG.
Pentahydroxypropyl diethylenetriamine	UCC.
Polyvinyl octadecyl carbamate	ESA.
Propanediol hydrochloride	WTK.
n-Propylaminoethanol	X.
Semicarbazide hydrochloride	OMC.
tert Butylurea	ADC.
tert Butyl ethanolamine	UCC.
Tetraethyl ammonium bromide	RSA.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 46—Continued

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were reported, identified by manufacturers, 1986

<i>Miscellaneous chemicals</i>	<i>Manufacturers' identification codes (according to list in table 47)</i>
Acyclic—Continued	
*Nitrogenous compounds—Continued	
Tetranitromethane	HML.
Thiosemicarbazide	FMT.
Trimethylamine hydrochloride	X.
All other nitrogenous compounds, acyclic	ADC, EK, FKE, OMC, PAS, PIC, RBC, RSA, SHX, STC, TNA, UCC, X, X, X, X, X.
*Acids, acid anhydrides, and acyl halides:	
*Acetic acid, synthetic (100%)	CEL, EKT, MON, UCC, USI.
Acetic anhydride, 100%:	
Acetic anhydride from acetaldehyde, 100%	EKT.
Acetic anhydride from acetic acid, other than recovered, by the vapor-phase process, 100%	CEL, UCC.
Acetic anhydride from acetic acid, recovered, by vapor-phase process	CEL, PFZ. WCC.
Acetyl chloride	BAS, CEL, RH, UCC.
*Acrylic acid	DUP, MON.
Adipic acid	EMR.
Azelaic acid	IMC.
2,2-bis(Hydroxy-methyl)-propionic acid	WCC.
Bromoacetic acid	GTL.
Bromobutyric acid	WTC, WTL.
tert-Butylperoxy maleic acid	CEL, EKT, PEN.
Butyric acid	EKT.
Butyric anhydride	TLC, WCC.
Butyryl chloride	CAS(E).
Castor oil fatty acids, dehydrated	PFZ.
Chloroacetic acid, mono	MLS, PFZ.
Citric acid	EKT.
Crotonic acid (2-Butenoic acid)	WTL.
Decanoyl chloride	RDA.
2,2-dichloroacetyl chloride	EMR, SYL, WTC.
*Dimer acid (C ₂₈ -Aliphatic dibasic acid)	ENJ.
Dimethylpropionic acid	EVN.
Dithiodiglycolic acid	EVN.
Dithiodipropionic acid	DUP.
Dodecanedioic acid	SK.
1,2-Ethanedithiolonic acid	EKT, UCC.
2-Ethylhexanoic acid (α -Ethylcaproic acid)	PPG, WTC, WTL.
*2-Ethylhexanoyl chloride	DRL, GLY, SHX, WTC.
*Fatty acids, hydrogenated	CAS, DRL, GLY, WTC.
*Fatty acids, non-hydrogenated	WTC.
Fatty acids, partially hydrogenated	CEL, UCC.
Formic acid, 90%	DKA, KLM, MON, PFZ.
*Fumaric acid	PFZ, PMP.
Gluconic acid, technical	EK.
Glutaric acid	DUP.
Glycolic acid (Hydroxyacetic acid)	PIC.
Heptafluorobutyric anhydride	CEL, ENJ.
Heptanoic acid	VAL.
Isothionic acid (2-Hydroxyethanesulfonic acid)	PFZ.
Isoascorbic acid (Erythorbic acid)	EKX.
Isobutyric acid	EKT.
Isobutyric anhydride	STC.
Isononanoyl chloride	SYL.
Iso-octadecenoic acid	UCC.
Isopentanoic acid	PFZ.
Itaconic acid (Methylenesuccinic acid)	MON.
Lactic acid, edible, 100%	VAL.
Lactic acid, tech	WCC, WTL.
Lauroyl chloride	PFN.
Maleic acid	DKA.
Malic acid	EVN.
Mercaptoacetic acid (Thioglycolic acid)	

SECTION 15. MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS

Table 46—Continued

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were reported, identified by manufacturers, 1986

<i>Miscellaneous chemicals</i>	<i>Manufacturers' identification codes (according to list in table 47)</i>
Acyclic—Continued	
*Acids, acid anhydrides, and acyl halides—Continued	
3-Mercaptopropionic acid	EVN, WTC.
Mercaptosuccinic acid (Thiomalic acid)	EVN.
Methacrylic acid	RH.
Methanesulfonic acid	PAS.
Methanesulfonyl chloride	PAS.
Neodecanolic acid	ENJ.
Neodecanoyl chloride	WTC.
Neohexanoic acid	WTC.
Nonanoic acid (Pelargonic acid)	CEL, EMR.
Octanoyl chloride	WCC.
Oleic acid	DRL, GLY, WTC.
Oxidized Fischer Tropsch wax	SNW.
Palmitoyl chloride	STC.
Perfluoropropionic anhydride	PIC.
Peroxyacetic acid	FMB, UCC.
*Pivaloyl chloride	PPG, WCC, WTC.
Polyacrylic acid	BFG, BKM, RH, SNW.
*Propionic acid	CEL, EKT, UCC.
Propionic anhydride	EKT.
Propionyl chloride	WCC.
Sebacic acid	WTH.
Sebacoyl chloride	ALD, EK.
Sorbic acid (2,4-Hexadienoic acid)	MON.
Thioacetic acid	EVN.
3,3'-Thiodipropionic acid	EVN.
Thiodisuccinic acid	EVN.
Thiolactic acid	EVN.
Trifluoroacetic acid	HOC.
Trifluoroacetic anhydride	HOC.
Trimerdicarboxylic acids	WTC.
Valeric acid	UCC.
All other acids, acid anhydrides, and acyl halides	AAC, DRL, ENJ, FMC, PG, WCC, WTC.
*Salts of organic acids:	
*Acetic acid salts:	
Aluminum acetate	NCC.
Ammonium acetate	BKC, WTK.
Barium acetate	BKC.
Calcium acetate	HFT, NCC.
Chromium acetate	SHP.
Cobalt acetate	SHP.
Cobalt manganese acetate	SHP.
Copper acetate	BKC.
Hydrazine acetate	FMT.
Lead acetate	BKC.
Lead subacetate	BKC.
Magnesium acetate	BKC, SHP.
Manganese acetate	SHP.
Nickel acetate	BKC, SHP.
*Potassium acetate	BKC, HCP, JRC, NCC, PEL.
*Sodium acetate	ATL, BKC, BRI, DAN, HCP, JRC, MAL, NCC, UCC, VAL, X.
Sodium diacetate	HCP, JRC, NCC.
*Zinc acetate	BKC, DIX, SHP, WTK.
Zirconium acetate	CCC, TZC.
Adipic acid, ammonium salt	ACS.
Adipic acid, sodium salt	RSA.
Adipic dihydrazide	FMT.
Allylsulfonic acid, sodium salt	JSC.
Chloroacetic acid, sodium salt	X.
Citric acid salts:	
Ammonium citrate	PFZ.
Calcium citrate	PFZ.
Potassium citrate	HXL, MLS, PFZ.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 46—Continued

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were reported, identified by manufacturers, 1986

<i>Miscellaneous chemicals</i>	<i>Manufacturers' identification codes (according to list in table 47)</i>
Acyclic—Continued	
*Salts of organic acids—Continued	
Citric acid salts—Continued	
*Sodium citrate	CIN, HXL, MLS, PCI, PG, PFZ, X. EVN.
Diammonium dithiodiglycolate	NOC.
*2-Ethylhexanoic acid (alpha-ethylcaproic acid) salts:	NOD, WTC.
Aluminum 2-ethylhexanoate	SHP.
Barium 2-ethylhexanoate	CCA, FER, VNC, WTC.
Bismuth 2-ethylhexanoate	CCA, MCI, NOD, TRO, WTC.
Cadmium 2-ethylhexanoate	MCI, SHP.
*Calcium 2-ethylhexanoate	CCA, MCI, NOD, SHP, TRO.
Chromium 2-ethylhexanoate	MCI.
*Cobalt 2-ethylhexanoate	MCI, NOD.
Cobalt-potassium 2-ethylhexanoate	WTC.
Copper 2-ethylhexanoate	CCA, NOD.
Dibutyltin di-2-ethylhexanoate	CCA, COS, NOD, SHP, TRO.
Iron 2-ethylhexanoate	CCA, MCI, NOD, SHP, TRO.
*Lead 2-ethylhexanoate	MCI, SHP.
*Manganese 2-ethylhexanoate	CCA, MCI, PEL, WTC.
Nickel 2-ethylhexanoate	CCA, MCI, NOD.
Potassium 2-ethylhexanoate	FER.
Rare earths 2-ethylhexanoate	CCA, FER, MCI, NOD, OMC, SHP, VNC.
Stannous 2-ethylhexanoate	CCA, MCI, NOD, TRO, WTC.
*Zinc 2-ethylhexanoate	LIL, NOD, SHP.
*Zirconium 2-ethylhexanoate	
All other 2-ethylhexanoic acid (alpha-ethylcaproic acid) salts	
Formic acid salts:	
Potassium formate	HCP, JRC.
Sodium formate	CEL.
Sodium formate, refined	WTK.
Sodium formate, technical	BKC, PST.
All other formic acid salts	RSA, WTK.
Fumaric acid, lead salt	ALI.
Gluconic acid salts:	
Sodium gluconate	PFN, PCI, PFZ, X.
Glycolic acid, sodium salt	
Potassium glycolate	HCP, JRC.
Isoascorbic acid, sodium salt (Sodium erythorbate)	HCP, JRC, X.
2-Hydroxy-3(2-propenyloxy)-1-propanesulfonic acid, sodium salt	PFZ.
Tertiary-alpha-alkylcarboxylic acid salts (isocarboxylic acid salts):	
Calcium t- α -alkylcarboxylate	AAC.
Cobalt t- α -alkylcarboxylate	MCI.
Copper t- α -alkylcarboxylate	MCI.
Isononanoic acid, lead salt	CCA.
Isooctanoic acid, calcium salt	CCA.
Lactic acid salts:	
Ammonium lactate	WM.
Calcium lactate	CCA.
Sodium lactate (Nalac)	PFN.
All other lactic acid salts	PFN.
Lauric acid salts:	
Barium cadmium laurate	FER, WTC.
Dibutyltin dilaurate	WTC, X.
Tin laurate	FER.
Lead salts of menhaden fish oil, C ₁₄ to C ₂₂ (lead fishate)	ELC, MCI.
Linoleic acid salts:	
Calcium linoleate	CCA.
Lead linoleate	IMC.
Maleic acid salts:	
Dibutyltin maleate	WTC.
Tribasic lead maleate	ALI.

SECTION 15. MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS

Table 46—Continued

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were reported, identified by manufacturers, 1986

<i>Miscellaneous chemicals</i>	<i>Manufacturers' identification codes (according to list in table 47)</i>
Acyclic—Continued	
*Salts of organic acids—Continued	
Mercaptoacetic acid (Thioglycolic acid) salts:	
Ammonium mercaptoacetate	EVN, WTC.
Calcium mercaptoacetate	EVN.
Sodium mercaptoacetate	EVN, X.
Neodecanoic acid salts:	
Bismuth neodecanoate	COS.
*Calcium neodecanoate	CCA, MCI, SHP.
Cobalt neodecanoate	MCI, SHP.
Lead-cobalt neodecanoate	MCI.
Lead neodecanoate	MCI.
Lithium neodecanoate	MCI.
Manganese neodecanoate	MCI, SHP.
Rare earths neodecanoate	MCI, SHP.
Zinc/calcium/cobalt neodecanoate	MCI.
Zinc neodecanoate	SHP.
Zirconium neodecanoate	MCI, SHP.
Octanoic acid (Caprylic acid) salts:	
Aluminum octanoate	SYP, WTC.
Stannous octanoate	SYP.
All other octanoic acid (Caprylic acid) salts	ALI, WTC.
Oleic acid salts:	
Calcium oleate	X.
Copper oleate	MCI.
Sodium oleate	WTC.
Oxalic acid salts:	
*Ammonium oxalate	BKC, HML, WTK.
*Potassium oxalate	BKC, HML, WTK.
Sodium oxalate	BKC, HML, WTK.
All other oxalic acid salts	SHP.
Phosphorodithioic acid salts (Dithiophosphates):	
Potassium dihexyl phosphorodithioate	ACY.
Sodium di-sec-butyl/diethyl phosphorodithioate	ACY.
Sodium di-sec-butyl phosphorodithioate	ACY.
Sodium diethylphosphorodithioate	ACY.
Sodium dihexyl phosphorodithioate	ACY.
Sodium diisopropyl phosphorodithioate	ACY.
All other phosphorodithioic acid salts (Dithiophosphates)	ESX.
Propionic acid salts:	
*Calcium propionate	HFT, KMI, NCC, SOL.
*Sodium propionate	HFT, NCC, SOL.
Ricinoleic acid salts:	
Calcium ricinoleate	CAS(E).
All other ricinoleic acid salts	CAS(E).
Silver trifluoroacetate	EK.
Sodium di-2-ethylhexyl sulfosuccinate	WPG.
Sodium formaldehyde bisulfite	EK.
Sodium-N-methyl-N-oleyl taurate	WPG.
*Stearic acid salts:	
Aluminum stearates:	
*Aluminum distearate	MAL, NOC, NOD, SYP.
Aluminum monostearate	MAL, NOD, SYP.
*Aluminum tristearate	MAL, NOC, NOD, SYP, X.
All other aluminum stearates	WTC.
Ammonium stearate	WPG.
*Barium stearate	ALI, NOC, NOD, SYP, VNC, WTC.
*Cadmium stearate	FER, SYP, VNC, WTC.
*Calcium stearate	FER, MAL, NOC, NOD, SNW, SYP, WTC.
Cobalt stearate	MCI, SHP.
Lead stearate	ALI.
Lead stearate, dibasic	ALI.
Lithium stearate	NOC, SYP, WTC.
*Magnesium stearate	MAL, NOD, SYP, WTC.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 46—Continued

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were reported, identified by manufacturers, 1986

<i>Miscellaneous chemicals</i>	<i>Manufacturers' identification codes (according to list in table 47)</i>
Acyclic—Continued	
*Salts of organic acids—Continued	
*Stearic acid salts—Continued	
Manganese stearate	ALI.
Potassium stearate	WTC.
Sodium stearate	WTC.
Strontium stearate	WTC.
Trioxo aluminum tristearate	KCH.
*Zinc stearate	CCC,MAL,NOC, NOD, PLS, SYP, VNC, WTC.
Tartaric acid salts:	
Potassium sodium tartrate	PFZ.
All other salts of organic acids	EK, EKX, FER, PFN, RSA, STC, TCH, WTC.
*Aldehydes:	
Acetaldehyde	CEL, EKX, UCC.
Acrolein (Acrylaldehyde)	UCC.
*Butyraldehyde	BAS, CEL, EKX, UCC.
Crotonaldehyde-	EKT.
2-Ethylhexanal (α -Ethylcaproaldehyde)	EKX, UCC.
* Formaldehyde (37% HCHO by weight)	BOR, CBD, CEL, DUP, GAF, GP, HPC,IMC, MON,PKI, RCI.
Glutaraldehyde	UCC.
Glyoxal	ACY.
Isobutyraldehyde	BAS, CEL, EKX, TU, UCC.
Isopentaldehyde, mixed isomers	UCC.
*Propionaldehyde	CEL, EKX, UCC.
Succinaldehyde-sodium bisulfite complex	EK.
Valeraldehyde (Pentanal)	UCC.
All other aldehydes, acyclic	ASL, UCC.
*Ketones:	
Acetone:	
*Acetone from cumene	ACS, BTL, DOW, GGC, SHC, USS.
*Acetone from isopropyl alcohol	EKT, ENJ, GE, SHC, UCC.
Acetone, crude	ATR.
5-Chloro-2-pentanone	SDW.
1-Chloropinacolone	CHG, NES.
Chloro-2-propanone (Chloroacetone)	EK, MRK.
Dialsoopropyl ketone (2,4-Dimethyl-3-pentanone)	EKX.
2-Heptanone (Methyl amyl ketone)	EKT.
3-Heptanone (Ethyl butyl ketone)	UCC.
*4-Hydroxy-4-methyl-2-pentanone (Diacetone alcohol)	CEL, SHC, UCC.
Isovalerone (Dlsoobutyl ketone)	EKT, UCC.
*Methyl ethyl ketone	ATR, CEL, ENJ, SHC, UCC.
5-Methyl-2-hexanone (Methyl isoamyl ketone)	EKT.
*Methyl isobutyl ketone (4-Methyl-2-pentanone)	EKT, ENJ, SHC, UCC.
4-Methyl-3-penten-2-one (Mesityl oxide)	UCC.
Methylpseudolonone	NCI.
2-Octanone (Hexyl methyl ketone)	WTH.
2,4-Pentanedione (Acetylacetone)	UCC.
3-Pentanone (Diethyl ketone)	EKT, HEX, ORT, UCC.
Pseudolonone	NCI, SCM.
2,6,8-Trimethyl-4-nonanone (Isobutyl heptyl ketone)	UCC.
*Alcohols, monohydric, unsubstituted:	
*Alcohols, C₁₁ or lower, unmixed (95% or more pure):	
Allyl alcohol	FMC.
Amyl alcohols:	
Amyl alcohol, primary	UCC.
2-Methyl-1-butanol	UCC.
3-Methyl-1-butanol	CPS.
1-Pentanol	UCC.
*Butyl alcohols:	
*n-Butyl alcohol (n-Propylcarbinol)	BAS, CEL, CXI, EKX, GAF, SHC, UCC, VST.

SECTION 15. MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS

Table 46—Continued

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were reported, identified by manufacturers, 1986

<i>Miscellaneous chemicals</i>	<i>Manufacturers' identification codes (according to list in table 47)</i>
Acyclic—Continued	
*Salts of organic acids—Continued	
*Butyl alcohols—Continued	
sec-Butyl alcohol (Methylethylcarbinol)	ENJ, SHC.
tert-Butyl alcohol (Trimethylcarbinol)	ATR.
*Isobutyl alcohol (Isopropylcarbinol)	BAS, CEL, CPS, EKX, SHC, UCC.
1-Decanol	TNA, VST.
Diisobutyl alcohol	UCC.
*Ethyl alcohol, synthetic only	CEL, DOW, EKX, SHC, UCC, USI.
*2-Ethyl-1-hexanol	BAS, EKX, SHC, TU, UCC.
n-Heptyl alcohol	EKX.
n-Hexyl alcohol	TNA, VST.
Isodecyl alcohol	ENJ.
Isoheptyl alcohol	ENJ.
Isononyl alcohol	ENJ.
Iso-octyl alcohol	ENJ.
*Isopropyl alcohol	ATR, ENJ, SHC, UCC.
*Methanol, synthetic only	AIP, BOR, CEL, DUP, EKT, GGC, HST, LYP, MON, PLC, TX.
Methyl amyl alcohol	UCC.
2-Methyl-1-pentanol	UCC.
4-Methyl-2-pentanol (1-Methylisobutylcarbinol)	SHC, UCC.
1-Octanol	TNA, VST.
2-Octanol (sec-Capryl alcohol)	WTH.
*Propyl alcohol (Propanol)	CEL, EKX, UCC.
2-Propyn-1-ol (Propargyl alcohol)	GAF.
Undecanol (Linear C ₁₁ alcohol)	ENJ.
Alcohols, unmixed C ₁₁ or lower, other	UCC.
*Alcohols C₁₂ or higher, unmixed (95% or more pure):	
Dodecyl alcohol (Lauryl alcohol)	TNA, VST.
1-Hexadecanol (Cetyl alcohol)	CRN, PG, VST.
2-Hexyl-1-decanol	SCP.
Iso-octadecyl alcohol	SHX.
1-Octadecanol (Stearyl alcohol)	CRN, PG, TNA, VST.
cis-9-Octadecen-1-ol (Oleyl alcohol)	SHX.
1-Tetradecanol (Myristyl alcohol)	VST.
1-Tridecanol	ENJ.
2,6,8-Trimethyl-4-nonanol	UCC.
*Mixtures of alcohols:	
*Alcohol mixtures, C ₁₁ or lower only	CXI, EKX, ENJ, SHC, TNA, UCC, VST.
Alcohol mixtures, C ₁₀ and C ₂₀ only	TNA.
*Alcohol mixtures, C ₁₂ through C ₁₈ only	ENJ, PG, SHC, SHX, TNA, VST.
All other mixtures of alcohols	ENJ, MON, PG, SCP, VST, WTK.
*Esters of monohydric alcohols:	
Acrylic monomers, mixed	AAC, REZ.
*Allyl methacrylate	AAC, CPS, GLY.
Amyl acetates:	
Amyl acetate (n-Pentyl acetate)	UCC.
All other amyl acetates	WTL.
Butyl acetates:	
*n-Butyl acetate	BAS, CEL, EKT, UCC.
*Isobutyl acetate	BAS, CEL, EKT, EKX, UCC.
*Butyl acrylate	BAS, CEL, RH, UCC.
n-Butyl chlorocrotonate	MAL.
sec-Butyl chloroformate	PPG, VCM.
Butyl lactate	CPS.
Butyl maleate	TCH.
Butyl mercaptopropionate	EVN.
Butyl methacrylate	DUP, RH.
Butyl oleate	ELC.
tert-Butyl peroxyacetate	AZT, WTL.
tert-Butyl peroxy-2-ethylhexanoate	WTC, WTL.
tert-Butyl peroxyisobutyrate	WTL.
tert-Butyl peroxyisopropylcarbonate	PPG, WTL.
tert-Butyl peroxyneodecanoate	WTC, WTL.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 46—Continued

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were reported, identified by manufacturers, 1986

Miscellaneous chemicals	Manufacturers' identification codes (according to list in table 47)
Acyclic—Continued	
*Esters of monohydric alcohols—Continued	
*Butyl acrylate—Continued	BAS, CEL, RH, UCC.
tert-Butyl peroxyvalate	AZT, WTC, WTL.
Butyl stearate	CRN.
Cetylcosyl methacrylate	RH.
Cetyl lactate	SBC, VND.
Diallyl maleate	AAC, FMC.
Dibutyl fumarate	RCI.
*Dibutyl maleate	NOD, RCI, USS.
Di(sec-butyl)peroxydicarbonate	WTL.
Diethyl carbonate (Ethyl carbonate)	PPG.
Di(2-ethyl-1-hexyl) maleate	CCC, CHP, FTX, RPC, STC.
*Dilauryl-3,3'-thiodipropionate	CCW, EVN, WTC.
Dimethyl carbonate	PPG.
Dimethyl maleate	AAC.
Dimyristyl-3,3'-thiodipropionate	CCW.
*Dioctyl maleate	NOD, RCI, USS.
Distearyl maleate	EFH.
*Distearyl-3,3'-thiodipropionate	CCW, EVN, WTC.
Dihobis(stearyl propionate)	EVN.
Ditridecyl maleate	EFH.
Di(tridecyl)-3,3'-thiodipropionate	EVN, WTC.
Dodecylpentadecyl methacrylate	RH.
Dodecyl succinic lactate	SM.
*2-Ethoxyethyl acetate	EKT, ICI, UCC.
*Ethyl acetate (100% base)	CEL, EKT, EKX, MON, UCC.
Ethyl acetoacetate	BRD, EKT.
*Ethyl acrylate	CEL, RH, UCC.
Ethyl chloroacetate	SK.
Ethyl chloroformate	ESX, PPG.
Ethyl chlorothioformate	SFA.
Ethylene carbonate	TX.
Ethyl-3-ethoxy propionate	UCC.
2-Ethyl-1-hexyl acetate	EKT, UCC.
*2-Ethyl-1-hexyl acrylate	BAS, CEL, UCC.
2-Ethylhexyl chloroformate	PPG, VCM.
2-Ethyl-1-hexyl methacrylate	DUP.
Ethyl sulfate (Diethyl sulfate)	UCC.
*Fatty acid esters, not included with plasticizers or surface-active agents:	
Docosanyl docosenoate	SBC.
Isocetyl stearate	SCP.
Isopropyl lanolate	VND.
Isopropyl lnoleate	VND.
Methyl esters of coconut oil	PG.
Methyl esters of lard	FER.
Methyl esters of tallow	CHL, FER.
Methyl 12-hydroxystearate	CAS, WTH.
Methyl iso-octadecenoate	SYL.
Methyl lnoleate	HRT.
Methyl stearate	CHL, WTC.
Myristyl myristate	CYL, SBC, VND.
*Tridecyl stearate	RPC, SCP, STC, WTC.
All other fatty acid esters, not included with plasticizers surface-active agents	
Hexyl acetate	HDG, HPC, SBC, WTC.
Hexyl acrylate	ENJ.
Isoamyl ethylmalonate	CPS.
Isobutyl acrylate	WTC.
Isobutyl chloroformate	BAS.
Isobutyl isobutyrate	PPG, VCM.
Isobutyl methacrylate	EKX.
Isodecyl acrylate	RH.
Isodecyl methacrylate	CPS.
	RH.

SECTION 15. MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS

Table 46—Continued

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were reported, identified by manufacturers, 1986

<i>Miscellaneous chemicals</i>	<i>Manufacturers' identification codes (according to list in table 47)</i>
Acyclic-Continued	
*Esters of monohydric alcohols—Continued	
Iso-octyl mercaptoacetate	CCW, EVN.
Iso-octyl-3-mercaptopropionate	EVN.
Isopropyl acetate	EKT, UCC.
Isopropyl chloroformate	PPG, VCM.
Isostearyl neopentanoate	SBC, VND.
Lauryl acrylate	CPS.
Lauryl lactate	VND.
Di(2-ethyl-1-hexyl) peroxydicarbonate	WTL.
Diethyl maleate	ACY.
Diethyl oxalate (Ethyl oxalate)	X.
*Lauryl methacrylate	AAC, CPS, RH, TX.
Maleic esters and copolymers	GAF.
2-Methoxyethyl acrylate	CPS.
Methyl acetate	MON.
Methyl acetoacetate	BRD, EKT.
Methyl acrylate, monomer	CEL.
Methyl chloroformate	PPG.
Methyl formate	CEL.
*Methyl methacrylate, monomer	CYR, DUP, RH, UCC.
Methyl sulfate (Dimethyl sulfate)	DUP.
Methyl thioglycolate	EVN.
Myristyl lactate	VND.
Octadecyl-3-mercaptopropionate	EVN.
*Phosphorus acid esters:	
Amyl hydrogen phosphate	HK, COC.
Bis (2-Chloroethyl)-2-chloroethylphosphonate	ALW.
Bis(2-ethylhexyl) hydrogen phosphate	ALW.
Butyl hydrogen phosphate	ALW, HK.
Dibutyl butylphosphonate	ALW, HDG.
Dibutyl hydrogen phosphite	ALW, SFS.
Dibutyl pyrophosphate	ALW.
Diethyl hydrogen phosphite	ALW.
o,o-Diethyl-o-phenyl phosphorothioate	SFA.
Diethyl phosphorothionio dichloride	TNA.
Diethyl phosphorochloridothionate	MON, SFS, TNA.
Dimethyl hydrogen phosphite	ALW.
Dimethyl methylphosphonate	ALW, HDG, SFS.
Dimethyl phosphoridothionate	MON, SFA.
Dioleil hydrogen phosphite	ALW.
2-Ethylhexyl hydrogen phosphate	ALW.
Iso-octyl hydrogen phosphate	ALW.
Methyl dihydrogen phosphate	HK.
Mixed dialkyl hydrogen phosphates, amine salts	ELC.
Stearyl acid phosphate	HK.
Tetrakis(2-chloroethyl)ethylene diphosphate	OMC.
Trialkyl phosphite	MCB.
Tributyl phosphate	FMC.
Triethyl phosphite	ALW, SFA.
Triso-octyl phosphite	ALW, MCB.
Trisopropyl phosphite	ALW.
Trimethyl phosphite	ALW, SFA.
Tris(2-chloroethyl)phosphite	ALW.
Tris(chloroisopropyl)thionophosphate	ALW.
Tris(2-ethylhexyl) phosphite	ALW, MON.
All other phosphorus acid esters	AZT, MCB, SFA, SFS, WTC, X.
*Propyl acetate	CEL, EKT, UCC.
n-Propyl chloroformate	VCM.
Propylene carbonate	TX.
*Stearyl methacrylate	CPS, RH, TX.
Tetraethyl orthosilicate (Tetraethyl silicate)	UCC.
Tetraethyl silicate, condensed	UCC.
Tetramethyl silicate	KF.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 46—Continued

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were reported, identified by manufacturers, 1986

Miscellaneous chemicals	Manufacturers' identification codes (according to list in table 47)
Acyclic-Continued	
*Esters of monohydric alcohols—Continued	
Tetrapropyl silicate	KF.
Titanic acid esters:	
Bis(2-[bis(2-hydroxyethyl)amino]ethyl)diisopropyl titanate	DUP.
Di(hydroxy)bis(ammoniumlactato)titanium	DUP.
Diisopropyltitanate bis(ethyl-3-oxobutanoate)	DUP.
Tetrabutyl titanate	DUP.
Tetraisopropyl titanate	DUP.
Tetrakis(2-ethylhexyl)titanate	DUP, KF.
Triethanolamine titanate	KF.
All other titanic acid esters	DUP.
Trichloromethyl chloroformate	MHI.
Triethyl orthoacetate	KF.
Triethyl orthoformate	KF.
Triethyl orthopropionate	KF.
Trifluoroethyl methacrylate	COC.
Trimethyl orthoacetate	KF.
Trimethyl orthoformate	KF.
Tristearyl citrate	CYL.
*Vinyl acetate, monomer	CEL, PLC, UCC, USI.
Vinyl crotonate	FER.
All other monohydric alcohol esters	AAC, ENJ, FKE, MON, PIC, WTL, X.
*Polyhydric alcohols:	
2,2-Bis(bromomethyl)-1,3-propanediol	DOW.
1,2 (and 1,3)-Butanediol	CEL.
*1,4-Butanediol	BAS, DUP, GAF, X.
2-Butene-1,4-diol	GAF.
2-Butyne-1,4-diol	BAS, GAF.
3-Chloro-1,2-propanediol (Glycerol α -chlorohydrin)	DIX, EVN.
2,2-Dimethyl-1,3-propanediol (Neopentyl glycol)	BAS, EKX.
*Ethylene glycol	BAS, CEL, CIX, DOW, EKX, HCF, ICI, NWP, OMC, PDG, PLC, SHC, TX, UCC. CRN, UCC.
2-Ethyl-1,3-hexanediol	
2-Ethyl-2-(hydroxymethyl)-1,3-propanediol (Trimethylolpropane)	CEL.
Glycerol, synthetic only	DOW.
1,6-Hexanediol	BAS, CXI, HMY.
2-(Hydroxymethyl)-2-methyl-1,3-propanediol (Trimethylolethane)	IMC.
Mannitol	ICI.
3-Mercapto-1,2-propanediol (Thioglycerol)	EVN.
2-Methyl-2,4-pentanediol (Hexylene glycol)	SHC, UCC.
*Pentaerythritol	CEL, DOW, HPC, IMC, PST.
Polyether glycol	DOW.
*Propylene glycol (1,2-Propanediol)	ATR, DOW, OMC, TX, UCC.
*Sorbitol (70% by weight)	BRD, EHC, ICI, PFZ.
2,2,4-Trimethyl-1,3-pentanediol	EKX.
All other polyhydric alcohols	ICI, SHC, VIK.
Esters and ethers of polyhydric alcohols:	
*Polyhydric alcohol esters:	
*2-(2-Butoxyethoxy)ethyl acetate	EKT, ICI, UCC.
*2-Butoxyethyl acetate	EKT, ICI, UCC.
1,3-Butylene glycol diborate	USB.
1,3-Butylene glycol diborate/hexylene glycol boric anhydride	USB.
Diethylene glycol adipate	CMB.
Diethylene glycol, borated	OMC.
Diethylene glycol dimethacrylate	CPS.
Dihydromyrcene	SCM, X.
2-(2-Ethoxyethoxy)ethyl acetate	AAC, EKT.
Ethylene glycol diacetate	CPS, EKT.
Ethylene glycol dimercaptoacetate	EVN.

SECTION 15. MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS

Table 46—Continued

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were reported, identified by manufacturers, 1986

<i>Miscellaneous chemicals</i>	<i>Manufacturers' identification codes (according to list in table 47)</i>
Acyclic—Continued	
Esters and ethers of polyhydric alcohols—Continued	
*Polyhydric alcohol esters—Continued	
Ethylene glycol dimethacrylate	CPS.
Ethylene glycol hydroxyacetate	CCA.
Ethylene glycol phosphite	ALW.
Glycerol propoxylate triacrylate	REZ.
Glyceryl diacetate (Diacetin)	HAL.
Glyceryl monoacetate (Monacetin)	HAL.
Glyceryl monothloglycolate	EVN, WTC.
Glyceryl triacetate (Triacetin)	EKT.
Glyceryl tristearate	GLY.
1,6-Hexanediol diacrylate	REZ.
Hydroxyethyl acrylate	DOW, RH.
Hydroxyethyl methacrylate	RH.
Hydroxypropyl acrylate	DOW, RH.
Hydroxypropyl methacrylate	AAC, REZ, RH.
2-Methoxyethyl acetate	UCC.
Pentaerythritol caprylate/caprinate	WM.
Pentaerythritol stearate	GLY.
Pentaerythritol tetraacrylate	REZ.
Pentaerythritol tetrakis (3-Mercaptopropionate)	EVN.
Polyol aluminum chelate	SNW.
Sucrose octa-acetate	HFT.
Tetraethylene glycol diacrylate	REZ.
Tetraethylene glycol dimethacrylate	AAC.
Trimethylolpropane triacrylate	REZ, RH, SM.
Trimethylolpropane triacrylate, ethoxylated	AAC, REZ.
Trimethylolpropane tri(2-mercaptopropionate)	EVN, REZ.
Trimethylolpropane trioleate (TMP trioleate)	EFH.
2,2,3-Trimethyl-1,3-pentanediol monoisobutyrate	EKX.
Tripropylene glycol diacrylate	REZ.
All other polyhydric alcohol esters	EKX, PCI, SHX, SNW, WCC, X.
*Polyhydric alcohol ethers:	
Bis(2-butoxyethyl)ether (Diethylene glycol di-n-butyl ether) ...	ASL, FER.
Bis(2-ethoxyethyl)ether (Diethylene glycoldiethyl ether)	ASL, FER.
Bis[2-(2-methoxyethoxy)ethyl] ether (Tetraethylene glycol dimethyl ether)	ASL, FER.
*Bis(2-methoxyethyl)ether (Diethylene glycol dimethyl ether)	ASL, FER, UCC.
*2-Butoxyethanol (Ethylene glycol monobutyl ether)	DOW, EKX, ICI, OMC, SHC, UCC.
*2-(2-Butoxyethoxy)ethanol (Diethylene glycol monobutyl ether)	DOW, EKX, ICI, OMC, SHC, UCC.
*2-[2-(2-Butoxyethoxy)ethoxy]ethanol (Triethylene glycol monobutyl ether)	DOW, OMC, UCC.
1-Butoxyethoxy-2-propanol	UCC.
Butyl ethers of tetra- and higher ethylene glycols (high boiling)	EKX, ICI.
*Diethylene glycol	BAS, CEL, CXI, DOW, EKX, HST, ICI, OMC, PDG, SHC, TX, UCC.
Dimethoxyethane (Ethylene glycol dimethyl ether)	ASL, FER.
*Dipropylene glycol	ATR, CXI, DOW, OMC, TX, UCC.
Dipropylene glycol monomethyl ether	OMC.
*2-Ethoxyethanol (Ethylene glycol monoethyl ether)	EKX, ICI, OMC, SHC, UCC.
*2-(2-Ethoxyethoxy)ethanol (Diethylene glycol monoethyl ether)	DOW, ICI, OMC, UCC.
*2-[2-(2-Ethoxyethoxy)ethoxy]ethanol (Triethylene glycol monoethyl ether)	DOW, EKX, OMC, UCC.
Ethylene glycol di-tributyl ether	EKX.
Ethylene glycol monoisobutyl ether	OMC.
Ethyl ethers of tetra- and higher ethylene glycols (high boiling)	EKX, ICI.
2-[2-(Hexyloxy)ethoxy]ethanol	UCC.
Isobutanol glycol ether	UCC.
*2-Methoxyethanol (Ethylene glycol monomethyl ether)	CXI, ICI, OMC, UCC.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 46—Continued

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were reported, identified by manufacturers, 1986

<i>Miscellaneous chemicals</i>	<i>Manufacturers' identification codes (according to list in table 47)</i>
Acyclic—Continued	
*Salts of organic acids—Continued	
*Ester and ethers of polyhydric alcohols—Continued	
*Polyhydric alcohol ethers—Continued	
*2-(2-Methoxyethoxy)ethanol (Diethylene glycol monomethyl ether)	DOW, ICI, OMC, UCC.
*2-[2-(2-Methoxyethoxy)ethoxy]ethanol. (Triethylene glycol monomethyl ether)	DOW, ICI, OMC, UCC.
2-(2-Methoxyethoxy)ethyl-2-methoxyethyl ether (Triethylene glycol dimethyl ether)	ASL, FER, OMC. STC, UCC.
Methoxypolyethylene glycol	DOW, OMC.
1-Methoxy-2-propanol	DOW.
3-(3-Methoxypropoxy)propanol	DOW.
3-3-(3-Methoxypropoxy)propoxypropanol	DOW.
Paraformaldehyde	CEL.
Polyethoxy propoxydiethylene glycol ether	TX.
Polyethylene glycol	CRN, DOW, ETC, GAF, HDG, ICI, STC, UCC X, X.
*Polyethylene glycol dimethyl ether	OMC, SHX, TX, X, X.
*Polyglycols, ethylene glycol and glycol ether, mixed	CEL, CXI, UCC, X.
Polypropoxy ethers:	
Poly(propoxy)butyl ether, ethoxylated	TX.
All other polypropoxy ethers	ICI.
Polyoxypropylene polyoxyethylene glycol, mixed	UCC.
*Polypropylene glycol	CXI, DOW, GAF, HDG, OMC, SM, STC, TX, X,X.
Polypropylene glycol glycerol tri-ether	X.
Polytetramethylene glycol ether	DUP, QKO.
Poly(1,1,1-trichlorobutane-2-ol)ethylene glycol dextrose ether	EKX.
Propoxyethanol (Ethylene glycol monopropyl ether)	EKX.
Propoxyethoxyethanol (Diethylene glycol monopropyl ether)	OMC.
Propylene glycol, mixed ethers	UCC.
Sorbitol, ethoxylated	GLY, ICI.
Sorbitol, propoxylated	ICI.
*Tetraethylene glycol	DOW, EKX, ICI, UCC.
2,2'-Thiodiethanol (Thiodiglycol)	PLC.
*Triethylene glycol	CEL, CXI, DOW, ICI, OMC, PDG, SHC, TX, UCC.
Trimethylolpropane trilaurate	WTC.
Tripropylene glycol	DOW, EKX, UCC.
Tripropylene glycol monomethyl ether	OMC.
Tri- and tetraethylene glycol monoethyl ethers, borate esters	OMC.
All other polyhydric alcohol ethers	CXI, DUP, HTM, MIL, OMC, UCC, X.
Brominated, chlorinated, and fluorinated hydrocarbons:	
*Brominated (including bromochlorinated) hydrocarbons:	
1-Bromobutane (n-Butyl bromide)	DAZ.
Bromochloromethane	DOW.
Bromoethane (Ethyl bromide)	DOW, GTL.
1-Bromohexadecane	HMY.
1-Bromohexane (n-Hexyl bromide)	WCC.
1-Bromo-3-methyl-2-butene	SD.
1-Bromo-octadecane	HMY.
1-Bromopropane (n-Propyl bromide)	DAZ.
Dibromomethane (Methylene bromide)	DOW.
1,1,2,2-Tetrabromoethane (Acetylene tetrabromide)	DOW.
Vinyl bromide (Bromoethylene)	TNA.
All other brominated (including bromochlorinated) hydrocarbons	HMY, TNA, WTC.
*Chlorinated (Not otherwise halogenated) hydrocarbons:	
*Carbon tetrachloride	DA, DOW, DUP, FRO, LCP, SFC.

SECTION 15. MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS

Table 46—Continued

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were reported, identified by manufacturers, 1986

<i>Miscellaneous chemicals</i>	<i>Manufacturers' identification codes (according to list in table 47)</i>
Acyclic—Continued	
Chlorinated (not otherwise halogenated) hydrocarbons—Continued	
Chlorinated paraffins (C₁₀–C₃₀):	
*Chlorinated paraffins, 35–64% chlorine	DA, DVC, FER, NEV, WTC.
Chlorinated paraffins, less than 35% chlorine	DVC, FER, SHC.
*Chlorinated paraffins, 85% or more chlorine	DA, DVC, FER, NEV.
1-Chlorobutane (n-Butyl chloride)	UCC.
*Chloroform	DA, DOW, FRO, LCP, SFC.
*Chloromethane (Methyl chloride)	DCC, DOW, LCP, SPD, TNA, VST.
3-Chloro-2-methyl-1-propene (Methyl chloride)	FMC.
3-Chloropropene (Allyl chloride)	DOW, SHC.
1,2-Dichloropropane (Propylene dichloride)	DOW.
2,3-Dichloropropane	DOW.
*Ethyl chloride (Chloroethane)	DOW, DUP, PPG, TNA.
*Ethylene dichloride	BFG, DA, DOW, FOR, FRO, GGC, OMC, PPG, SHC, VST.
Hexyl chloride	TNA.
Lauryl chlorides	SHC, TNA.
*Methylene chloride (Dichloromethane)	DA, DOW, FRO, LCP, SFC.
Neophyl chloride	TNA.
Octyl chloride	TNA.
*Perchloroethylene (Tetrachloroethane)	DA, DOW, DUP, FRO, PPG, SFC.
*1,1,1-Trichloroethane (Methyl chloroform)	DOW, FRO, PPG.
1,1,2-Trichloroethane (Vinyl trichloride)	DOW.
Trichloroethylene	DOW, PPG.
1,2,3-Trichloropropane	DOW.
1,2,3-Trichloropropene	DOW.
*Vinyl chloride, monomer (Chloroethylene)	BFG, BOR, DOW, FOR, GGC, PPG, SHC, VST.
Vinylidene chloride, monomer (1,1-Dichloroethylene)	DOW, PPG.
All other chlorinated (Not otherwise halogenated) hydrocarbons	WTC, X.
*Fluorinated (Including other fluorohalogenated) hydrocarbons:	
2-Bromo-2-chloro-1,1,1-trifluoroethane	HOC.
Bromotrifluoroethylene	DUP, GTL.
1-Chloro-1,1-difluoroethane	PAS.
*Chlorodifluoromethane (F22)	ACS, DUP, PAS, RCN.
Chlorotrifluoroethylene (Trifluorovinyl chloride)	ACS.
Chlorotrifluoromethane	DUP.
Dibromodifluoromethane	GTL.
*Dichlorodifluoromethane (F12)	ACS, DUP, KAI, PAS, RCN.
Dichlorotetrafluoroethane	ACS, DUP.
1,1-Difluoroethane	DUP, PAS.
Hexafluoropropylene, monomer	DUP.
1-Iodoperfluorohexane	DUP.
Polyhexafluoropropylene oxide	DUP.
Polytetrafluoroethylene ethyl iodide	X.
Tetrafluoroethylene, monomer	DUP, ICI.
Tetrafluoromethane	DUP.
*Trichlorofluoromethane (F11)	ACS, DUP, KAI, PAS, RCN.
Trichlorotrifluoroethane	ACS, DUP, PAS.
Trifluoroethanol	HOC.
Trifluoropropene	HOC.
Vinyl fluoride, monomer	DUP.
Vinylidene fluoride, monomer	PAS.
All other fluorinated (including other fluorohalo- genated) hydrocarbons	DUP, HOC, ICI, OH, REG.
*Other miscellaneous acyclic chemicals:	
*Iodinated (not otherwise halogenated) hydrocarbons:	
Diiodomethane (Methylene iodide)	DPW, RSA, X.
Iodobutane	RSA.
Iodoethane (Ethyl iodide), non-medical	DPW, RSA.
Iodomethane (Methyl iodide)	DPW, RSA.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 46—Continued

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were reported, identified by manufacturers, 1986

<i>Miscellaneous chemicals</i>	<i>Manufacturers' identification codes (according to list in table 47)</i>
Acyclic—Continued	
Iodinated (not otherwise halogenated) hydrocarbons—Continued	
*Other miscellaneous acyclic chemicals—Continued	
All other iodinated (not otherwise halogenated)	
hydrocarbons	DPW, EK.
Acetone sodium bisulfite	EK.
*Acyclic peroxides:	
Acetylacetone peroxide	CAD.
Acetyl peroxide	WTL.
*2-Butanone peroxide	CAD, FRE, NOC, WTC, WTL.
2-Butenedioic acid(=)-linoleic acid, reaction product	WVA.
n-Butyl-4,4-bis[t-butylperoxy]valerate	CAD.
tert-Butyl hydroperoxide	ATR, AZT, FRE, WTL.
*tert-Butyl peroxide (Di-tert-butyl peroxide)	AZT, WTC, WTL.
Decanoyl peroxide	WTL.
Di-(2-ethylhexy)peroxydicarbonate	WTC.
Diisopropyl peroxydicarbonate (isopropyl percarbonate)	EKX.
2,5-Dimethyl-2,5-bis(2-ethyl-1-hexanoyl peroxy) hexane	WTC, WTL.
2,5-Dimethyl-2,5-di(tert-butylperoxy)hexane	CAD, WTL.
2,5-Dimethyl-2,5-di(tert-butylperoxy)hexyne-3	WTL.
Diperoxydodecanedioic acid	MMC.
Di-n-propyl peroxydicarbonate	WTL.
Lauroyl peroxide	WTL.
Succinyl peroxide	WTC, WTL.
Tertiary amyl per-2-ethylhexanoate	WTC.
All other acyclic peroxides	PLC, WTC.
Carbon disulfide	PAS, SFI.
Chlorobutyl formol	ADC.
Chromium acetylacetonate complex	MCK.
2,3-Dibromopropanol	GTL.
*Epoxides, ethers, and acetals:	
Bis(2-Chloroethyl)ether (Dichlorodethyl ether)	BKM.
Butylene oxide	DOW.
Butyl ether (Di-n-butyl ether)	ATR.
Butyl vinyl ether	GAF.
Chloromethyl methyl ether	RH.
2,2-Dichloro-1,1-difluoroethyl methyl ether	OH.
Diethoxyethane	FER.
Dimethyl sulfone	CRZ.
Epichlorohydrin	DOW, SHC.
1,2-Ethanedithiol	RBC.
*Ethylene oxide	BAS, CEL, DOW, EKX, ICI, NWP, OMC, PDG, PLC, SHC, SNO, TX, UCC.
Ethyl ether, U.S.P.	USI.
Ethyl ether, absolute	EKX, USI.
Ethyl ether, tech	DOW, USI.
2-(Ethylmercapto)ethanol	DOM.
Ethyl vinyl ether	GAF.
Glycidol (2,3-Epoxy-1-propanol)	DIX.
*Glycidyl ethers:	
Alkyl glycidyl ethers, C ₁₂ -C ₁₄	WLN.
Alkyl glycidyl ethers, C ₈ -C ₁₀	WLN.
Allyl glycidyl ether (Allyloxy-2,3-epoxypropane)	AAC, CPS.
1,4-Butanediol diglycidyl ether	ALD, REZ, WLN.
*1-Butoxy-2,3-epoxypropane (Butyl glycidyl ether)	AAC, CPS, REZ, WLN.
2-Ethylhexyl glycidyl ether	WLN.
Polyol glycidyl ether	REZ, WLN.
All other glycidyl ethers	CEL, WLN.
Isopropyl ether	ENJ, SNC.
Malonaldehyde bis(dimethyl) acetal	KF.
Methylal (Dimethoxymethane)	CEL.
Methyl ether (Dimethyl ether)	AIP, DUP.
Methyl vinyl ether	GAF, UCC.
Propylene oxide	ATR, DOW.

SECTION 15. MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS

Table 46—Continued

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were reported, identified by manufacturers, 1986

<i>Miscellaneous chemicals</i>	<i>Manufacturers' identification codes (according to list in table 47)</i>
Acyclic—Continued	
*Other miscellaneous acyclic chemicals—Continued	
*Epoxides, ethers, and acetals—Continued	
All other epoxides, ethers, acetals	GAF, UCC, VIK.
*Fats and oils, chemically modified:	
Hydrogenated menhaden fish oil	CHL.
Hydrogenated tallow glycerides	CHL, WTC.
Linseed oil, oxygenated	CJO.
Sulfurized corn oil	SM.
Vegetable glycerides, hydrogenated	GLY.
All other fats and oils, chemically modified	CAS(E), CHL, WTC.
Glutaraldehyde bis(sodium bisulfite)	EK, FMT.
*Hydrocarbons:	
n-Decane	HMY, PLC.
3,3-Dimethylbutene	PLC.
n-Dodecane	HMY, PLC.
Hexadecane	HMY.
Myrcene	SCM, X.
n-Nonane	HMY, PLC.
n-Octadecane	HMY.
n-Octane	HMY, PLC.
n-Tetradecane	HMY.
All other hydrocarbons	PAS, WTK.
Iron acetylacetonate complex	MCK.
Manganese acetylacetonate complex	MCK.
2-Mercaptoethanol	PLC.
Methyl sulfide (Dimethyl sulfide)	GAY, PAS.
Methyl sulfoxide (Dimethyl sulfoxide)	GAY.
*Organo-aluminum compounds:	
Aluminum acetylacetonate complex	MCK.
Aluminum di-sec-butoxide acetoacetic ester chelate	CHT.
Aluminum diisopropoxide acetoacetic ester chelate	CHT.
Aluminum ethyl-3-oxobutanoate-O ₁ ,O ₃ -dihydroxy T-4	CHT.
Aluminum isopropoxide	CHT, KCH.
Aluminum tri-sec-butoxide	CHT.
Diethylaluminum chloride	TNA, TSA.
Diethyl aluminum ethoxide	TSA.
Diethylaluminum iodide	TNA, TSA.
Dialuminum chloride	TNA, TSA.
Dialuminum hydride	TNA, TSA.
Di-n-octylaluminum iodide	TSA.
Di-n-propylaluminum chloride	TSA.
Ethylaluminum dichloride	TNA, TSA.
Ethylaluminum sesquichloride	TNA, TSA.
Isobutylaluminum chloride	TSA.
Isopropenylaluminum	TSA.
Oxy-aluminum octanoate	CHT.
Sodium dihydrobis(2-methoxyethoxy)aluminum hydride	HXL.
Tri-n-butyl aluminum	TNA.
Triethylaluminum	TNA, TSA.
Tri-n-hexyl aluminum	TSA.
Trisobutylaluminum	TNA, TSA.
Trimethylaluminum	MHI, TNA.
Tri-n-octylaluminum	TNA, TSA.
Tri-oxyaluminum tri-isopropoxide	CHT.
Tri-n-propyl aluminum	TSA.
All other organo-aluminum compounds	KCH, TSA, X.
*Organo-boron compounds:	
Boron fluoride-ethyl ether complex	ACS.
Ethylamine with borane (1:1)	ACS.
Isopropyl borate	ADC.
N-Methyl-methanamine with borane (1:1)	X.
2-Methyl-2-propanamine with borane(1:1)	X.
Mixed alcohol borates	X.
Triethylborane	X.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 46—Continued

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were reported, identified by manufacturers, 1986

<i>Miscellaneous chemicals</i>	<i>Manufacturers' identification codes (according to list in table 47)</i>
Acyclic—Continued	
*Other miscellaneous acyclic chemicals—Continued	
*Organo-boron compounds—Continued	
Triethyl borate	ADC.
Triethyl boron	TSA.
Trimethoxyboroxine	X.
Trimethyl borate	SFS, X.
N,N,N-Trimethyl methanaminium octahydrotriborate	X
All other organo-boron compounds	MHI, STC.
Organo-lithium compounds:	
n-Butyllithium	FTE.
sec-Butyllithium	FTE.
Lithium hydroxystearate	WTC.
Organo-magnesium compounds:	
Butyl ethyl magnesium	TSA.
Di-n-butyl magnesium	TSA.
Di-n-hexyl magnesium	TSA.
Magnesium methylate	SOI.
Magnesium butoxide modified	TSA.
Methylmagnesium bromide	ARA.
Methylmagnesium chloride	ARA.
*Organo-silicon compounds:	
N-Aminoethylaminopropyl trimethoxysilane	KF.
α -Chloropropyltrichlorosilane	DCC.
Chloropropyltrimethoxysilane	DCC, KF.
Chlorotrimethylsilane	DCC.
Dichlorodimethylsilane	DCC.
Dichloromethylsilane	DCC.
Dichloromethylvinylsilane	DCC, UCC.
Diethoxyphosphorylethyltriethoxysilane	UCC.
Divinyl tetramethyldisiloxane	KF.
Ethyl polysilicate	SFS.
α -Glycidoxypropyltrimethoxysilane	UCC.
Hexamethyldisilazane	KF.
Hexyltrichlorosilane	KF.
Isobutyltrimethoxysilane	KF.
Mercaptopropyltrimethoxysilane	KF.
α -Methacryloxypropyltrimethoxysilane	UCC.
Methyltrimethoxysilane and polymethyltrisiloxane	DCC, UCC.
1,1,3,3-Pentamethyl-3-acetoxydisiloxane	KF.
Polyoxyalkene silicones	UCC.
*Silicone fluids	
Tetraethyl orthosilicate	DCC, SPD, SWS, UCC.
Trichloromethylsilane	SFS.
Trichloropropylsilane	DCC.
Trichlorovinylsilane	DCC.
Tris(2-methoxyethoxy)vinyl silane	UCC.
Tris(pentamethyldisiloxanyl)-3-methacrylatopropyl silane	KF.
Vinyltriethoxysilane	X.
Vinyltrimethoxy silane	UCC.
All other organo-silicone compounds	KF.
*Organo-tin compounds:	
Dibutyltin bis(butylmaleate)	KF, SFS, UCC, X, X, X.
Dibutyltin bis(isooctylmercaptoacetate)	CCA.
Dibutyltin bis(mercaptolaurate)	WTC, X.
Dibutyltin dichloride	X.
Dibutyltin-1OTG	WTC.
Dibutyltin oxide	WTC.
Ester tin mercaptoesters	X.
Monomethyl tin	CCA.
Octyltin	WTC.
Tin carboxylate	X.
Tributyltin fluoride	FER.
	X.

SECTION 15. MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS

Table 46—Continued

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were reported, identified by manufacturers, 1986

<i>Miscellaneous chemicals</i>	<i>Manufacturers' identification codes (according to list in table 47)</i>
Acyclic—Continued	
*Other miscellaneous acyclic chemicals—Continued	
Tributyltin propylene glycol maleate	CCA.
All other organo-tin compounds	CCW, COS, WTC.
Organo-zinc compounds:	
Diethylzinc	MHI, TSA.
Zinc acetylacetonate complex	MCK.
All other organo-zinc compounds	FER.
Perchloromethanethiol (Perchloromethyl mercaptan)	SFA, X.
Perfluoroalkyl polyether	X.
*Phosgene (Carbonyl chloride)	DUP, ICI, MOB, OMC, UCC, VDM.
Pine oil, synthetic	NCI.
Potassium 2-methyl-2-butanol	X.
Potassium 2-methyl-2-propanol	X.
Sodium ethoxide	RBC.
*Sodium methoxide (Sodium methylate)	DA, OMC, RBC.
Succinyl peroxide	WTL.
Titanium acetylacetonate complex	KF.
Trimethylsulfonium iodide	DPW.
Zirconium acetylacetonate complex	MCK.
All other miscellaneous acyclic chemicals	ABB, AIP, ANG, CGY, DUP, EKT, HPC, , IFF, NES, NOD, PIC, RBC, SFA, SFS, TNA, USR, X, X.
*Mixtures not specifically itemized:	
C ₁₂ -C ₁₈ Alcohol lactates	VND.
Alcohols, monohydric, and their esters, C ₆ and higher, mixed	EKX, X.
Butanol residue stream	CEL.
Butyl formcel	CEL.
Celtone	CEL.
Fatty acid amide mixtures	SHX.
Fatty acid residues	SHX.
Gluconic acid and salts, mixed	PMP.
Glycol residues	ICI, OMC.
Methacrylate based cationic polyelectrolytes	COS.
Methyl formcel	CEL.
Mixed chain length fatty acid, synthetic	ENJ.
Morpholine residue stream	TX.
Oxidate light ends	HCF.
Polymethacrylic acid esters	AAC.
Silicone resins for mold release agents	CNI.
All other mixtures of miscellaneous acyclic chemicals not specifically itemized	BTL, CGY, CRN, CXI, MCB, MCI, MON, PCI, SHP, UCC, WTC.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 47

Miscellaneous cyclic and acyclic chemicals alphabetical directory of manufacturers by code, 1986

(Names of manufacturers that reported production and/or sales of miscellaneous cyclic and acyclic chemicals to the U.S. International Trade Commission for 1986 are listed below in the order of their identification codes as used in table 46)

<i>Code</i>	<i>Name of company</i>	<i>Code</i>	<i>Name of company</i>
AAC	Alcolac, Inc.	CWN	Upjohn Co., Fine Chemicals
ABB	Abbott Laboratories	CXI	Chemical Exchange Industries, Inc.
ACS	Allied Signal Inc., Engineered Material Sector	CYL	Cyclo Chemical Corp.
ACY	American Cyanamid Co.	DA	Diamond Shamrock Corp., Chemicals Div.
ADC	Anderson Development Co.	DAN	Dan River Inc., Chemical Products Div.
AIP	Air Products & Chemicals, Inc.	DAZ	Diaz Chemical Corp.
ALD	Aldrich Chemical Co., Inc.	DCC	Dow Corning Corp.
ALI	Anzon, Inc.	DIX	Dixie Chemical Co., Inc.
ALW	Albright & Wilson, Inc.	DKA	Denka Chemical Corp.
AMB	American Bio-Synthetics Corp.	DOM	Dominion Products, Inc.
AMO	Amoco Corp.	DOW	Dow Chemical Co.
ANG	Angus Chemical Co.	DPW	Deepwater, Inc.
ARC	Akzo Chemie America, ArmaK Chemicals	DRL	Unichema Chemicals, Inc.
ARS	Arsynco, Inc.	DUP	E.I. duPont de Nemours & Co., Inc. Chemicals & Pigments Dept. Polymer Products Dept.
ARZ	Arizona Chemical Co.	DVC	Dover Chemical Corp. Sub. of ICC Industries, Inc.
ASH	Ashland Oil, Inc.	EFH	E.F. Houghton & Co.
ASL	Specialtychem Products Corp.	EHC	Ethichem Corp.
ATL	Atlantic Industries, Inc.	EK	Eastman Kodak Co.:
ATR	Atlantic Richfield Co., Arco Chemical Co.	EKT	Tennessee Eastman Co. Div.
AZT	Catalyst Resources, Inc.	EKX	Texas Eastman Co. Div.
BAS	BASF Corp.	ELC	Elco Corp. Sub of Detrex Chemical Industries, Inc.
BCC	Buffalo Color Corp.	ELI	Eli Lilly & Co.
BFG	B. F. Goodrich Co., B.F. Goodrich Chemical Group	EMR	Emery Industries Div. of National Distillers & Chemical Corp.
BKC	J.T. Baker Chemical Co.	ENJ	Exxon Chemical Americas
BKM	Buckman Laboratories, Inc.	ESA	East Shore Chemical Co.
BOC	Blocraft Laboratories, Inc.	ESX	Essex Chemical Corp., Essex Industrial Chemicals, Inc.
BOR	Borden Inc., Borden Chemical Div.	ETC	Ethox Chemicals Inc.
BRD	Lonza, Inc.	EVN	W.R. Grace & Co., Organic Chemicals Div. Evans Chemetics
BRI	Burlington Industries, Inc.	FER	Ferro Corp.:
BTL	BTL of Illinois, Inc.		Ferro Chemical Div. Grant Chemical Div. Kell Chemical Div.
CAD	Akzo Chemie America, Noury Chemicals	FKE	Frank Enterprises, Inc.
CAS	Caschem, Inc.	FMB	FMC Corp., Peroxygen Chemicals Div.
CBD	Chembond Corp.	FMC	FMC Corp.
CCA	Interstab Chemicals, Inc.	FMT	Fairmount Chemical Co., Inc.
CCC	C.N.C. International Inc.	FOC	Handschy Industries, Inc., Farac Varnishes Chemicals
CCW	Morton-Thiokol, Inc., Carstab Div.	FOR	Formosa Plastics Corporation Louisiana
CED	Cedar Chemical Co.	FRE	Freeman Chemical Corp.
CEL	Celanese Corp.:	FRO	Vulcan Materials Co., Chemicals Div.
	Celanese Chemical Co., Inc.	FTE	Foot Mineral Co.
	Celanese Engineering Resins, Inc.	FTX	Finetex, Inc.
CGY	Ciba-Geigy Corp.	GAF	GAF Corp., Chemical Group
CHG	Mobay Chemical Corp., Agricultural Chemicals Div.	GAN	Gane's Chemicals, Inc.
CHL	Chernol, Inc.	GAY	Gaylord Container
CHP	C.H. Patrick & Co., Inc.	GE	General Electric Co.
CHT	Chatter, Inc.		
CIN	Stockhausen, Inc.		
CJO	C.J. Osborn Chemicals, Inc.		
CMB	Cambridge Industries Co.		
CNI	Conap, Inc.		
CNP	Nipro, Inc.		
COC	Columbia Organic Chemicals Co., Inc.		
COS	Cosan Chemical Corp.		
CPS	CPS Chemical Co., Inc.		
CRN	CPC International, Inc., Amerchol Corp.		
CRZ	Crown Zellerbach Corp.		

SECTION 15. MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS

Table 47—Continued

Miscellaneous cyclic and acyclic chemicals alphabetical directory of manufacturers by code, 1986

<i>Code</i>	<i>Name of company</i>	<i>Code</i>	<i>Name of company</i>
GGC	Georgia-Gulf Corp.: Boundbrook Div. Plaquemine Div.	MRF	Morflex Corp.
GIV	Givaudan Corp.	MRK	Merck & Co., Inc.
GLY	Glyco, Inc.	NCC	Niacet Corp.
GP	Georgia-Pacific Corp.: Resins Operations	NCI	Union Carbide Corp., Terpene & Aromatics Div.
GTL	Great Lakes Chemical Corp.	NCI	Union Carbide Corp., Chemical Products Div.
HAL	C.P. Hall Co.	NES	Rutgers-Nease Chemical Co.
HCC	Hatco Chemical Corp.	NEV	Neville Chemical Co.
HCP	Honig Chemical & Processing Corp.	NOC	Norac Co., Inc. Mathe Div.
HDG	Hodag Chemical Corp.	NOD	Nuodex, Inc.
HEX	Hexagon Laboratories, Inc.	NSC	National Starch & Chemical Corp.
HFT	Syntex Agribusiness, Inc., Nutrition & Chemical Div.	NWP	USI Chemicals Co. Inc.
HK	Occidental Chemical Corp., & Specialty Chemical Div.	OH	Anaquest
HML	Hummel Chemical Co.	OMC	Olin Corp.
HMP	W.R. Grace & Co., Hampshire Chemicals Div.	ORT	Roehr Chemicals, Inc.
HMY	Humphrey Chemical Co.	PAC	Pacific Anchor Chemical Corp.
HOC	Halocarbon Products Corp.	PD	Parke-Davis, Div. of Warner-Lambert Co.
HPC	Hercules, Inc.	PAS	Pennwalt Corp.
HRT	Hart Products Corp.	PCI	Piedmont Chemical Industries, Inc.
HST	American Hoechst Corp., Hoechst Fiber Industries Div.	PDG	P.D. Glycol
HTM	Haltermann Ltd. Co.	PEL	Pelron Corp.
HXL	Hexcel Corp., Hexcel Chemical Products	PEN	CPC International, Inc., Penick Corp.
ICI	ICI Americas, Inc.: Chemicals Div. Rubicon Inc.	PFN	Pfanstiehl Laboratories, Inc.
IFF	International Flavors & Fragrances, Inc.	PFZ	Pfizer, Inc. and Pfizer Pharmaceuticals, Inc.
IMC	International Minerals & Chemical Corp., Industries Chemicals Div.	PG	Procter & Gamble Co., Procter & Gamble Mfg. Co.
JRC	Jarchem Industries, Inc.	PIC	Pierce Chemical Co.
JSC	Sybron Chemicals, Inc.	PKI	Perkins Industries, Inc.
JTO	Jetco Chemicals Inc.	PLC	Phillips Petroleum Co.
KAI	Kaiser Aluminum & Chemical Corp.	PLS	Plastics Engineering Co.
KCH	Joseph Ayers, Inc.	PMP	PMP Fermentation Products, Inc.
KF	Dynamit Nobel Chemical Div.	PPG	PPG Industries, Inc.
KLM	Kalama Chemical, Inc.	PSG	PMC Specialties Group Inc.
KMI	Kemln Industries, Inc.	PST	Perstorp Polyols, Inc.
LCP	LCP Chemicals - West Virginia, Inc.	QKO	QO Chemicals, Inc.
LEM	Napp Chemicals, Inc.	RBC	Artel Chemical Corp.
LIL	Eli Lilly & Co.	RCI	Reichhold Chemicals, Inc.
LYP	Lyondell Petrochemical Co.	RCN	Racon, Inc.
MAL	Mallinckrodt, Inc.	RDA	Rhone-Poulenc, Inc.
MCB	Borg-Warner Corp., Borg-Warner Chemicals	REG	Regis Chemical Co.
MCI	Mooney Chemicals, Inc.	REM	Remington Arms Co., Inc.
MCK	Mackenzie Chemical Works, Inc.	REZ	Interez, Inc.
MHI	Morton-Thokol, Inc., Ventron Div.	RH	Rohm & Haas Co.
MIL	Milliken & Co., Milliken Chemical Co.	RPC	Millmaster Onyx Group, Inc., Lyndall Chemical Co. Div.
MLS	Miles Laboratories, Inc., Biotechnology Group	RSA	R.S.A. Corp.
MMC	EM Industries, Inc., EM Science Div.	S	Sandoz, Inc.
MOB	Mobay Chemical Corp., Pittsburgh Div.	SBC	Scher Chemicals, Inc.
MON	Monsanto Co.	SCM	SCM Corp.: Gildco Organic.
		SCP	Henkel Corp.
		SD	Sterling Drug, Inc.: Sterling Pharmaceuticals, Inc.
		SDC	Sandoz Chemicals Corp.
		SDW	Sterling Drug, Inc. Sterling Organics Div. Stauffer Chemicals Group
		SFA	Agricultural Div.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 47—Continued

Miscellaneous cyclic and acyclic chemicals alphabetical directory of manufacturers by code, 1986

<i>Code</i>	<i>Name of company</i>	<i>Code</i>	<i>Name of company</i>
SFC	Calho Chemicals, Inc.	UCC	Union Carbide Corp.
SFS	Specialty Chemicals Group.	UPJ	Upjohn Co. and Polymer Chemical Div.
SHP	Shepherd Chemical Co.	UPM	UOP, Inc.
SHC	Shell Oil Co., Shell Chemical Co. Div.	USB	U.S. Borax & Chemical Corp., U.S. Borax Research Corp.
SHX	Sherex Chemical Co., Inc.	USI	National Distillers & Chemicals Corp., U.S. Industrial Chemicals Co.
SK	SmithKline Chemicals.	USR	Uniroyal, Inc., Uniroyal Chemical Div.
SM	Mobil Oil Corp.: Chemical Products Div.	USS	U.S. Steel Corp., USS Chemicals Div.
SNO	SunOlin Chemical Co.	UTC	Unitex Chemical Corp.
SNW	Sun Chemical Corp., Chemicals Div.	VAL	United Merchants & Manufacturers, Inc., Valchem Div.
SOH	Standard Oil Chemical Co.	VCM	Vanchem, Inc.
SOI	Specialty Organics, Inc.	VDM	Van De Mark Chemical Co., Inc.
SOL	Southland Corp., Fine Chemical Div.	VEL	Velcol Chemical Corp.
SPD	General Electric Co., Silicone Products Dept.	VGC	Virginia Chemicals, Inc.
STC	American Hoechst Corp., Sou-Tex Works	VIK	Viking Chemical Co.
SWS	Stauffer Chemical Co., Stauffer-Wacker Silicones Div.	VNC	Vanderbilt Chemical Corp.
SYL	Sylvachem Corp.	VND	Van Dyk, Div. of Mallinckrodt, Inc.
SYP	Synthetic Products Co., Division of Plastic Specialties & Technology, Inc.	VST	Vieta Chemical Co.
TCC	Sybron Chemicals, Inc.	WCC	White Chemical Corp.
TCH	Emery Industries, Inc., Tylon Div.	WCL	Wright Chemical Corp.
TLC	Twin Lake Chemical, Inc.	WLN	Wilmington Chemical Corp.
TLI	Teledyne Industries, Inc., Teledyne McCormick Selph	WM	Inolex Chemical Co.
TNA	Ethyl Corp.	WPG	West Point-Pepperell, Inc., Grifftex Chemical Co. Sub.
TNI	Gillette Co., Chemical Div.	WTC	Witco Chemical Corp.
TRO	Troy Chemical Corp.	WTH	Union Camp Corp.
TSA	Texas Alkyls, Inc.	WTK	Whittaker Corp., Helco Chemicals Div.
TU	Tenn-USS Chemicals Co.	WTL	Pennwalt Corp., Lucidol Div.
TX	Texaco, Inc., Texaco Chemical Co.	WVA	Westvaco Corp.,
TZC	Magnesium Elektron, Inc.		

Note—Complete names, telephone numbers, and addresses of the above reporting companies are listed in appendix A.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

APPENDIX A
DIRECTORY OF MANUFACTURERS

SYNTHETIC ORGANIC CHEMICALS, 1986

Table A-1

Synthetic organic chemicals alphabetical directory of manufacturers, by company, 1986

(Names of synthetic organic chemicals manufacturers that reported production and/or sales to the U.S. International Trade Commission for 1986 are listed below alphabetically, together with their identification codes as used in table 2 of the 15 individual sections of this report)

Ident- fication Code	Name of company	Telephone number	Office address
AEP	A & E Plastic Inc	818-968-3801	14505 Proctor Ave., Industry, CA 91745.
AZS	AZS Corp	404-873-1851	762 Marietta Blvd., N.W., Atlanta, GA 30318.
AZS	Chemical Corp	404-873-1850	762 Marietta Blvd., N.W., Atlanta, GA 30318.
ABB	Abbott Laboratories	312-937-7262	14th St. & Sheridan Rd., N. Chicago, IL 60064.
ABS	Abex Corp., Friction Products Div., U.S .	703-662-3871	P.O. Box 3250, Winchester, VA 22601.
ILI	Acme Steel Company	312-849-2500	13500 S. Perry Avenue Riverdale, IL 60627
ACO	Adco Chemical Co	201-589-0880	49-129 Rutherford St., Newark, NJ 07105.
WLC	Agrico Chemical Co	918-588-2000	One William Center, Tulsa, OK 74172.
AIP	Air Products & Chemicals, Inc.	215-481-4911	P.O. Box 538, Allentown, PA 18105.
AJY	Ajay Chemicals, Inc	404-943-6202	P.O. Box 127, Powder Springs, GA 30073.
AJI	Ajinomoto U.S.A., Inc	919-832-2890	4020 Ajinomoto Dr., Raleigh, NC 27610.
ARC	Akzo Chemie America, ArmaK Chemicals .	312-906-7544	300 S. Riverside, Plaza Chicago, IL 60606.
ALW	Albright & Wilson, Inc	804-752-6100	P.O. Box 26229, Richmond, VA 23260.
ALC	Alco Chemical Corp	615-629-1405	909 Mueller Dr., Chattanooga, TN 37406.
AAC	Alcolac, Inc	301-355-2600	3440 Fairfield Rd., Baltimore, MD 21226.
ALD	Aldrich Chemical Co., Inc	414-273-3850	940 W. St. Paul Ave., Milwaukee, WI 53233.
ALE	Alex Chemical Co	717-462-3500	119 N. Union St., Shenandoah, PA 17976.
ALG	Allegheny Chemical Corp	814-776-1186	Gillis Ave., Ridgway, PA 15853.
ALL	Alliance Chemical, Inc	201-945-5400	309-327 Avenue P. Newark N.J. 07105.
ACS	Allied Signal Inc. Engineered Material	201-455-5000	P.O. Box 1087-R, Morristown, NJ 07960.
BME	Allied-Bendix Corp., Friction	518-273-6550	P.O. Box 238 Green Island, NY.
	Materials Div.		
ALX	Alox Corp	716-282-1295	3943 Buffalo Ave., Niagara Falls, NY 14303.
APH	Alpha Corporation of Tennessee	901-853-2450	P.O. Drawer A, Hwy. 57 E, Collerville, TN 38017.
ALP	Alpha Laboratories, Inc	303-756-1338	1685 S. Fairfax St., Denver, CO 80222.
HES	Amerada Hess Corp.	201-750-6000	1 Hess Plaza, Woodbridge, NJ 07095.
	(Hess Oil Virgin Island Corp.)		
AMB	American Bio-Synthetics Corp	414-384-7017	710 W. National Ave., Milwaukee, WI 53204.
ACY	American Cyanamid Co	201-831-2768	One Cyanamid Plaza, Wayne, NJ 07470.
HST	American Hoechst Corp.:		
	Hoechst Fibers Industries Div.	803-579-5522	P.O. Box 5887, Frontage Rd. Spartanburg, S.C 29304.
	Petrochemicals/Plastics Group	201-231-2426	Route 202-206 North, Somerville, NJ 08876.
STC	Sou-tex Works	704-827-7531	P.O. Box 866, Mount Holly, NC 28120.
	Specialty Products Group, Rhode	401-823-2000	129 Quindnick St., Coventry, RI 02816.
	Island Works.		
ASY	American Synthetic Rubber Corp	502-448-2761	P.O. Box 32960, Louisville, KY 40232.
SPO	Ameripol Synpol Co. Div. of	216-762-4442	146 South High St. Akron, Ohio 44308.
	Unroyal Goodrich Tire Co.,		
HVG	Ametek, Inc., Haveg Div	302-995-0400	900 Greenbank Rd., Wilmington, DE 19808.

APPENDIX A

Table A-1—Continued

Synthetic organic chemicals alphabetical directory of manufacturers, by company, 1986

<i>Identifi- cation Code</i>	<i>Name of company</i>	<i>Telephone number</i>	<i>Office address</i>
AMO	Amoco Corporation	312-856-6111	P.O. Box 87703 Mail Code 1201, Chicago, IL 60680-0703.
AMV	Amvac Chemical Corp	213-264-3910	4100 E. Washington Blvd., Los Angeles, CA 90023.
OH	Anaquest	608-273-0019	2005 W. Beltline Hwy., Madison, WI 53713.
ADC	Anderson Development Co	517-263-2121	1415 E. Michigan St., Adrian, MI 49221.
ANG	Angus Chemical Co	312-498-6700	2211 Sanders Rd., Northbrook, IL 60062.
ALI	Anzon, Inc	215-427-3000	2545 Aramingo Ave., Philadelphia, PA 19125.
APX	Apex Chemical Co., Inc	201-354-5420	200 S. First St., Elizabethport, NJ 07206.
APO	Apollo Colors, Inc	312-564-9190	899 Skokle Blvd., Northbrook, IL 60062.
ARD	Ardmore Chemical Co	201-481-2406	29 Riverside Ave., Newark, NJ 07104.
ARN	Arenol Chemical Corp	718-784-0948	40-33-23d St., Long Island City, NY 11101.
ARZ	Arizona Chemical Co	904-785-6700	200 So. Sudduth Pl., Panama City, FL 32404.
ALS	Armco, Inc , Eastern Steel Div	513-316-5200	703 Curtis St., Middletown, OH 45043.
ARP	Armour Pharmaceutical Co	815-932-6771	P.O. Box 511, Kankakee, IL 60901.
ARK	Armstrong World Industries, Inc.	717-397-0611	Liberty & Charlotte Ste., Lancaster, PA 17604.
ARO	ARNCO	714-739-7900	One Centerpointe Dr., South Gate, CA 90280.
ARL	Arol Chemical Products Co	201-344-1510	649 Ferry St., Newark, NJ 07105.
ARS	Arsynco, Inc. Sub Div. of Aceto Corp. ...	718-898-2300	126-20 Northern Blvd., Flushing, NY 11368.
RBC	Artel Chemical Corp	304-755-3336	P.O. Box 550 Nitro, W.VA. 25143.
ASH	Ashland Oil, Inc	614-889-3333	P.O. Box 2219, Columbus, OH 43216.
	Ashland Petroleum Co	606-329-3333	P.O. Box 391, Ashland, KY 41101.
API	Asoma Polymers, Inc	617-987-0144	Old Webster Rd., Oxford, MA 01540.
BLA	Astor Products, Inc.,	904-783-5000	5244 Edgewood Ct., Jacksonville, FL 32205.
	Blue Arrow Div		
ATL	Atlantic Industries, Inc	201-235-1800	10 Kingsland Rd., Nutley, NJ 07110.
ATR	Atlantic Richfield Co.,	215-557-2000	1500 Market St., Philadelphia, PA 19101.
	Arco Chemical Co.		
APD	Atlas Powder Co., sub. of Tyler Corp. ...	417-624-0212	P.O. Box 87, Joplin, MO 64802.
RSN	Atochem Inc. Polymers Div	201-447-3300	266 Harristown Rd., Glen Rock, N.J. 07452.
	Polyrez Div	609-845-1813	S. Columbia St. RR. Woodbury, N.J. 08096.
AUX	Auralux Corp	203-886-2616	P.O. Box 113 Yantic CT. 06389.
KCH	Joseph Ayers, Inc	215-837-1808	275 Keystone Dr., Bethlehem, PA 18017.
HYN	BBL Microbiology System	301-771-0100	250 Schilling Circle Cockeysville, Md. 21030
BTL	BTL of Illinois, Inc	419-244-5856	2112 Sylvan Ave., Toledo, Oh. 43606.
BAS	BASF Corp	616-392-2391	491 Columbia Ave., Holland, MI 49423.
		201-263-5045	and 100 Cherry Hill Rd., Parsippany, NJ 07054.
ICF	Inmont Div	201-365-3400	1255 Broad St., Clifton, NJ 07015.
		201-263-4050	and 100 Cherry Hill Rd., Parsippany,
BKC	J. T. Baker Chemical Co	201-859-2151	222 Red School Lane, Phillipsburg, NJ 08865.
BCK	Beckman Instruments, Inc	619-993-8740	2470 Faraday Ave. Carlsbad, CA 92008.
	Diagnostic Systems Group		
BIB	Splnco Div	714-871-4848	1050 Page Mill Rd., Palo Alto, CA 94304.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table A-1—Continued

Synthetic organic chemicals alphabetical directory of manufacturers, by company, 1986

<i>Identification Code</i>	<i>Name of company</i>	<i>Telephone number</i>	<i>Office address</i>
BEE	Beecham, Inc., Beecham Laboratories Div	201-469-5200	101 Possumtown Rd., Piscataway, NJ 08854.
BEW	Beecham, Inc: Beecham Western Hemisphere, Inc. . . .	201-881-3000	3 Garret Mountain Plaza, West Paterson, NJ 07424.
BCM	Belding Chemical Industries	212-944-6040	Grosvenor Dale, CT 06246.
BLZ	Belzak Corp	201-773-0602	850 Bloomfield Ave., Clifton, NJ 07012.
BEN	Bennett Paint Corp	801-486-2211	2131 South 300 West Salt Lake City, UT 84115.
BTS	Bethlehem Steel Corp	215-694-4522	866 Martin Tower-8th Fl., Bethlehem, PA 18016.
BDS	Biddle Sawyer Corp	212-736-1580	2 Penn Plaza-Suite 2439, New York, NY 10121.
BNS	Binney and Smith, Inc	215-253-6271	1100 Church Lane, Easton, PA 18044-0431.
BOC	Blocraft Laboratories, Inc	201-796-3434	12 Industrial Park, Waldwick, NJ 07463.
BNP	Bison Nitrogen Products Co	712-277-1340	Terra Centre, 600 4th St., Sioux City, IA 51101.
BMX	Blu-Max Pigments Div	312-586-8400	7000 W. 60th, Chicago, IL 60638.
BOE	Boehme Filatex, Inc	919-342-1051	Rt. 10 Box 1 Reidsville, N.C. 27320
LAK	Bofors Nobel, Inc	616-788-2341	5025 Evanston Ave., Muskegon, MI 49443.
BOR	Borden, Inc.: Borden Chemical Div	614-225-4000	180 E. Broad St., Columbus, OH 43215.
MCB	Borg-Warner Corp., Borg-Warner Chemicals	304-424-5411	International Center, Parkersburg, WV 26101.
BFP	Breddo Inc	913-321-5300	18th & Kansas Ave., Kansas City, KS 66105.
BMC	Brin-Mont Chemicals, Inc	919-292-0566	3921 Spring Garden St., Greensboro, NC 27407.
BRS	Bristol-Myers Co	212-546-4000	345 Park Ave., New York, NY 10154
BRU	M. A. Bruder & Sons, Inc	215-353-5100	52nd & Grays Ave., Philadelphia, PA 19143
BKM	Buckman Laboratories, Inc	901-278-0330	1256 N. McLean Blvd., Memphis, TN 38122.
BCC	Buffalo Color Corp	716-827-4500	100 Lee St., Buffalo, NY 14210.
BRI	Burlington Industries Inc	919-379-2000	3330 W. Friendly Ave. Greensboro, N.C. 27406
BUR	Burroughs Wellcome Co	919-248-3000	3030 Cornwallis Rd., Research Triangle Park, NC 27709.
CFI	CF Industries, Inc	312-438-9500	Salem Lake Dr., Long Grove, IL 60047.
CLU	CL Industries, Inc	217-662-2136	P.O. Box 218 Georgetown, IL 61846.
CCC	C.N.C. International, Inc CPC International, Inc.:	401-769-6100	20 Priviledge St., Woonsocket, RI 02895.
ACR	Acme Resin Corp	312-450-4651	10330 W. Roosevelt Rd. Westchester, IL 60153
CRN	Amerchol Corp	201-287-1600	136 Talmadge Rd., Edison NJ 08818-4051.
PEN	Penick Corp	201-621-2804	158 Mount Olivet Ave., Newark, NJ 07114.
CPS	CPS Chemical Co., Inc	201-727-3100	P.O. Box 162, Old Bridge, NJ 08857.
CYR	CYRO Industries	201-930-2000	155 Tice Blvd., P.O. Box 8588, Woodcliff Lake, NJ 07675.
CMB	Cambridge Industries Co	617-924-0026	440 Arsenal St., Watertown, MA 02172.
HCF	Cape Industries	919-341-5526	P.O. Box 327 Wilmington, NC 28402.
SVC	Capital City Products Co., Armstrong Chemical Plant.	614-299-3131	1530 S. Jackson St., Janesville, WI 53545.
CBC	Carbose Corp	814-443-1611	100 Maple St., Somerset, PA 15501.

APPENDIX A

Table A-1—Continued

Synthetic organic chemicals alphabetical directory of manufacturers, by company, 1986

<i>Identifi- fication Code</i>	<i>Name of company</i>	<i>Telephone number</i>	<i>Office address</i>
CGL CDT	Cargill, Inc Carondelet Coke Corp	612-475-7636 314-638-2400	P.O. Box 5630, Minneapolis, MN 55440. 526 E. Catalan Street St. Louis, MO. 63111
CHC BSC CAS CEI AZT CCL	Carpenter Chemical Co Cascade Resins, Inc Caschem, Inc CastChem, Inc Catalyst Resources, Inc Catawba-Charlab, Inc	804-359-0800 503-343-2111 201-858-7900 412-344-7500 800-231-2702 704-523-4242	P.O. Box 27205, Richmond, VA 23261. P.O. Box 1989, Eugene, OR 97440. 40 Avenue A, Bayonne, NJ 07002. P.O. Box 457 Muse, PA., 15350 P.O. Box 250, Elyria, OH 44035. 5046 Old Pineville Rd., Charlotte, NC 28224.
CED	Cedar Chemical Co	901-767-8851 501-572-3701	Rifle Range Road, Vicksburg, MS 39180 and Highway 242 South West Helena AR. 72390
CEL	Celanese Corp.: Celanese Chemical Co., Inc	214-689-4000	1250 W. Mockingbird Lane, Dallas, TX 75247.
	Celanese Fibers Operations Celanese Engineering Resins, Inc	704-554-2000 502-585-8011	P.O. Box 32414, Charlotte, NC 28232. 26 Main St. Chatham, NJ 07928
CLP	Cell Products, Inc	201-828-6100	5 Georges Rd., New Brunswick, NJ 08901.
CNT CPR GRS	Certainteed Corp Certified Processing Corp Champlin Petroleum Co	215-341-7000 201-923-5200 512-882-8871	P.O. Box 860, Valley Forge, PA 19482. U.S. Highway #22, Hillside, NJ 07205. P.O. Box 9176, Corpus Christi, TX 78469.
SOG CHA	Charter International Oil Co Chattanooga Coke & Chemicals Co., Inc.	713-923-3578 615-821-3541	P.O. Box 5008, Houston, TX 77012. 4800 Central Ave., P.O. Box 2339, Chattanooga, TN 37409.
CHT	Chatterm, Inc	615-821-4571	1715 W. 38th St., Chattanooga, TN 37409.
CBD	Chembond Corp	503-687-8840	1600 Valley River Dr., Suite 390, Eugene, OR 97401.
CFX CI CXI	Chemfax, Inc Chem-Fleur, Inc Chemical Exchange Industries, Inc.	601-863-6511 609-452-1000 713-526-8291	Three Rivers Rd., Gulfport, MS 39503. P.O. Box 5880 Princeton, NJ 08543 3813 Buffalo Speedway, Houston, TX 77098.
CMT	The Chernithon Corp	206-937-9954	5430 W. Marginal Way, SW., Seattle, WA 98106.
CHL	Chemol Co	919-272-3121	2410 Randolph Ave., Greensboro, NC 27420.
CRT SOC	Chemos Corp Chevron Corp., Chevron Chemical Co.	201-623-3334 415-894-7700	225-235 Emmet St., Newark, NJ 07114. 575 Market St., San Francisco, CA 94105.
CHH	CHR. Hansen's Laboratory, Inc	414-476-3630	9015 W. Maple St., West Allis, WI 53214.
CMC CGY	Chromatic Color Corp Ciba-Gelgy Corp	502-737-1700 914-478-3131	305 Ring Rd., Elizabethtown KY, 42701 444 Saw Mill River Rd., Ardsley, NY 10502.
	Ciba-Gelgy Corp Agricultural Di	914-347-4700 919-292-7100	3 Skyline Dr. Hawthorne N.Y. 10532 410 Swing Road, Greensboro, NC 27419.
CGO	Citgo Petroleum Corp	318-491-6263	P.O. Box 1562, Lake Charles, LA 70602.
CGU	Citizens Gas & Coke Utility	317-927-4463	3133 Southeastern Avenue Indianapolis, IN. 46203
CLI	Clintwood Chemical Co	312-890-5790	4342 S. Wolcott Ave., Chicago. IL 60609.
CSP	Coastal Refining & Marketing Inc.	713-877-1400	Nine Greenway Plaza, Houston, TX 77046.
CP	Colgate-Palmolive Co	212-310-2000	300 Park Ave., New York, NY 10022.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table A-1—Continued

Synthetic organic chemicals alphabetical directory of manufacturers, by company, 1986

<i>Identification Code</i>	<i>Name of company</i>	<i>Telephone number</i>	<i>Office address</i>
CLD	Colloids, Inc	201-926-6100	394 Frelinghuysen Ave., Newark, NJ 07114.
CCS	Colorado Chemical Specialties, Inc.	303-278-1963	4880 Robb St.-Unit #2, Wheat Ridge, CO 80033.
CRS	Colorado Resins, Inc	303-278-1963	4880 Robb St.-Unit #2, Wheat Ridge, CO 80033.
CIC	Color Chem International Corp	201-444-8563	7 Plymouth Rd., Glen Rock, NJ 07452.
CNC	Columbia Nitrogen Corp	404-823-4300	#23 Columbia Nitrogen Road, Augusta, GA 30903.
COC	Columbia Organic Chemical Co., Inc.	803-425-1786	1 Hickman Circle Cassatt SC 29032
CAC	Cominco Fertilizers Inc	509-747-6111	W. 818 Riverside Ave., Spokane, WA 99201.
CMP	Commercial Products Co., Inc	201-427-6887	117 Ethel Ave., Hawthorne, NJ 07506.
CNI	Conap, Inc	716-372-9650	1405 Buffalo St., Olean, NY 14760.
CON	Concord Chemical Co., Inc	609-966-1526	17th & Federal Sts., Camden, NJ 08105.
CO	Conoco Specialty Products, Inc	713-293-1764	600 N Dairy Ashford Rd. Houston, TX 77079.
CTL	Continental Chemical Co	201-472-5000	270 Clifton Blvd., Clifton, NJ 7011-3686
CTP	Continental Polymers, Inc	213-637-2103	2225 E. Del Amo Blvd., Compton, CA 90220.
CPV	Cook Paint & Varnish Co	816-391-6000	P.O. Box 419389 Kansas City, MO 64141.
COP	Coopers Creek Chemical Corp	215-828-0375	River Rd., West Conshohocken, PA 19428.
CPY	Copolymer Rubber & Chemical Corp.	504-355-5655	P.O. Box 2591, Baton Rouge, LA 70821.
CRP	Corpus Christi Petrochemicals Co.	713-751-7100	1000 Louisiana St., Suite 2700, Houston, TX 77002.
COS	Cosan Chemical Corp	201-400-9300	400-14th St., Carlstadt, NJ 07072.
CRD	Croda, Inc	212-683-3089	183 Madison Ave., New York, NY 10016.
CK	Crompton & Knowles Corp	215-775-8016	P.O. Box 341, Reading, PA 19603.
CCP	Crown Central Petroleum Corp	301-539-7400	1 N Charles St., Baltimore, MD 21203.
USM	Crown Metro, Inc	803-277-1870	P.O. Box 5695, Greenville, SC 29606.
CRZ	Crown Zellerbach Corp	206-254-0922	1 Bush Street San Francisco, CA 94104
CYT	Cumberland International Corp	713-682-1221	1523 N. Post Oak Rd., Houston, TX 77055.
CUS	Custom Pigments Corp	312-252-7273	2125 W. Rice St., Chicago, IL 60622.
CTR	Customs Resins Div. of Bemis Co., Inc.	612-340-6000	800 Northstar Ctr., Minneapolis, MN 42420.
CYH	Cychem, Inc	513-641-4371	P.O. Box 16056, Cincinnati, OH 45216.
CYL	Cyclo Chemical Corp	305-592-6700	7500 N.W. 66th St., Miami, FL 33166.
AMD	Cyclo Products, Inc	213-582-6411	1922 E. 64th St., Los Angeles, CA 90001.
DAN	Dan River, Inc., Chemical Products Div.	804-799-7000	P.O. Box 261, Danville, VA 24543.
DPI	Dart Polymers, Inc., Sub. of Dart Container Corp.	517-676-3800	432 Hogsback Rd., Mason, MI 48854.
DGO	Day-Glo Color Corp	216-391-7070	4515 St. Clair Ave., Cleveland, OH 44103.
DPW	Deepwater, Inc	714-751-3522	P.O. Box 17599, Irvine, CA 92713.
DGC	Degussa Corp	201-288-6500	Rt. 46 at Hollister Rd., Teterboro, NJ 07608.
DRR	Delta Resins & Refractories, Inc.	414-462-1200	6263 N. Teutonia Ave., Milwaukee, WI 53209.
DKA	Denka Chemical Corp	713-477-8821	8701 Park Place Blvd., Houston, TX 77017.
DNS	Dennis Chemical Co	314-771-1800	2700 Papin St., St. Louis, MO 63103.
DRB	Derby Co., Inc	617-342-5831	119 Authority Dr., Fitchburg, MA 01420.

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Table A-1—Continued

Synthetic organic chemicals alphabetical directory of manufacturers, by company, 1986

Identifi- cation Code	Name of company	Telephone number	Office address
DSO & PLX UDI	DeSoto, Inc	312-391-9000	1700 S. Mt. Prospect Rd., Des Plaines, IL 60018.
	DeSoto	817-625-2111	510 E. Central St., Fort Worth, TX 76113.
DTR	Detroit Coke Corp	312-842-6222	7819 West Jefferson Ave. Detroit, MI. 48209
DEX HYA	Dexter Chemical Corp	212-542-7700	845 Edgewater Rd., Bronx, NY 10474.
	Dexter Corp, Hysol Aerospace &	415-687-4201	2850 Willow Pass Road Pittsburgh, CA. 94565.
	Industrial Products Div., Dexter Specialty Chemical Group.		
HYC	Dexter Corp.,	818-968-6511	15051 E. Don Julian Rd., Industry, CA 91749.
	Hysol Electronic Chemical Div., Dexter Specialty Chemical Group.		
MID AGP	Midland Div	312-623-4200	E. Water St., Waukegan, IL 60085.
	Dial Corp	312-892-4381	2000 Aucutt Rd., Montgomery, AL 60538.
DA DAZ	Diamond Shamrock Chemicals Co	214-659-7000	351 Phelps Ct., Irving, TX 75015.
	Diaz Chemical Corp	716-638-6321	40 Jackson Street Holley, New York 14470.
PLN	Disogrin Industries Corp	603-669-4050	Grenier Industrial Airpark, Manchester, NH 03103.
GNT DIX	Diversitech General, Polymers Div.	216-798-3320	1 General St., Akron, OH 44329.
	Dixie Chemical Co., Inc	713-526-2604	3635 W. Dallas Ave., Houston, TX 77019.
DRC	Dock Resins Corp	201-862-2351	1512 W. Elizabeth Ave., Linden, NJ 07036.
DOM DVC	Dominion Products, Inc	718-499-3050	882-3rd Ave., Brooklyn, NY 11232.
	Dover Chemical Corp.	216-343-7711	W. 15th & Davis Sts., Dover, OH 44622.
	Sub. of ICC Industries, Inc.		
DOW	Dow Chemical Co	517-636-6125	2020 Willard H. Dow Center, Midland, MI 48674.
TCI	Dow Chemical Co.,	803-963-4261	P.O. Box 368, Greenville, SC 29602.
	Dow Consumer Products, Inc		
DCC	Dow Corning Corp	517-496-4000	2200 W. Saizburg Rd., Auburn, MI 48611.
DRX	Drexel Chemical Corp	901-774-4370	2487 Pennsylvania St. Memphis, TN 38109.
ABP DUP DSC KF	Drummond Company, Inc	205-387-0501	P.O. Box 1549 Jasper AL. 35501
	E. I. duPont de Nemours & Co., Inc.	313-466-1913	1101 West Street Wilmington, DE 19898.
	Dye Specialties, Inc	201-866-9504	100 Plaza Center, Secaucus, NJ 07094.
	Dynamit Nobel Chemicals, Inc	201-784-0200	10 Link Dr., Rockleigh, NJ 07647.
MMC	EM Industries, Inc., EM Science Div.	609-354-9200	2909 Highland Ave., Cincinnati, OH 45212.
AGI ECC EK EKT EKX ESA	EMS-American Grilon, Inc	803-481-9173	P.O. Box 1948, Sumter, SC 29151.
	Eastern Color & Chemical Co	401-331-9000	35 Livingston St., Providence, RI 02904.
	Eastman Kodak Co	716-724-4000	343 State St., Rochester, NY 14650.
	Tennessee Eastman Co. Div	615-229-2000	P.O. Box 1974, Kingsport, TN 37662.
	Texas Eastman Co. Div	214-236-5000	P.O. Box 1974, Kingsport, TN 37662.
	East Shore Chemical Co,	616-726-3106	1221 E. Barney Ave., Muskegon, MI 49443.
EEP	Eaton Corp.,	216-562-9111	1199 S. Chillicothe Rd., Aurora, OH 44202.
	Industrial Polymers Products Div.		
ELN ELC	Elan Chemical Co	201-344-8014	268 Doremus Ave., Newark, NJ 07105.
	Elco Corp. Sub. of	216-749-2605	1000 Beltline Rd. Cleveland OH 44109
	Detrex Chemical Industries, Inc.		
ELP EMR	El Paso Products Co	915-333-7200	619 N. Grant, Odessa, TX 79760.
	Emery Chemicals, Division of	513-530-7300	11501 North Lake Dr., Cincinnati, OH 45249.
	National Distillers & Chemical Corp.		
TCH	Emery Industries, Inc., Tylon Div.	803-963-4031	P.O. Box 628, Mauldin, SC 29662.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table A-1—Continued

Synthetic organic chemicals alphabetical directory of manufacturers, by company, 1986

Identifi- cation Code	Name of company	Telephone number	Office address
USM	Ernhart Corp., Bostik U.S. Div	617-777-0100	Boston St., Middleton, MA 01949.
EMK	Emkay Chemical Co	201-352-7053	319-2nd St., Elizabeth, NJ 07206.
EKO	Empire Coke Co	205-323-2400	1927 1st Ave., N. Birmingham, AL 35203.
ENO	Enenco, Inc	901-320-5800	P.O. Box 125, Memphis, TN 38101.
EPC	Enterprise Products Co. of Mississippi	713-972-1307	6161 Savoy Drive Houston, TX 77036
ESS	Essential Industries, Inc	414-691-3000	28391 Essential Rd., Merton, WI 53056.
ESX	Essex Chemical Corp., Essex Industrial Chemicals, Inc.	201-773-8300	1401 Broad St., Clifton, NJ 07015.
EHC	Ethichem Corp	201-933-7880	150 Grand St., Carlstadt, NJ 07072. South Carolina 29606
ETC	Ethox Chemicals, Inc	803-277-1620	P.O. Box 5094 Station B Greenville, South Carolina 2906.
TNA	Ethyl Corp	804-788-5000	330 S. 4th St., Richmond, VA 23219.
ENJ	Exxon Chemical Americas	713-870-6000	P.O. Box 3272, Houston, TX 77079.
FMC	FMC Corp	215-299-6000	2000 Market St., Philadelphia, PA 19103.
FMN	Agricultural Chemical Group	215-299-6000	2000 Market St., Philadelphia, PA 19103.
FMB	Peroxygen Chemicals Div	716-876-8300	Sawyer Ave. & River Rd., Town of Tonawanda, NY 14150.
FRP	FRP Co	912-367-3616	P.O. Box 349, Baxley, GA 31513.
FAB	Fabricolor Manufacturing Corp	201-742-3900	24-1/2 Van Houten St., Paterson, NJ 07509.
FMT	Fairmount Chemical Co., Inc	201-344-5790	117 Blanchard St., Newark, NJ 07105.
FRI	Farmiland Industries, Inc	816-459-6000	3315 North Oak Trafficway, Kansas City, MO, 64116 and.
FEL	Felton International, Inc	718-497-4664	599 Johnson Ave., Brooklyn, NY 11237.
SDS	Fermenta Plant Protection	216-357-3000	7528 Auburn Rd. P.O. Box 348, Palmsville, OH 44077
FER	Ferro Corp. Ferro Chemical Div	216-641-8580	7050 Krick Rd., Bedford, OH 44146.
	Grant Chemical Div	504-654-6801	P.O. Box 263, Baton Rouge, LA 70821.
	Kell Chemical Div	219-931-2630	3000 Sheffield Ave., Hammond, IN 46320.
CSD	Fina Oil & Chemical Co., Cosden Chemical Div.	214-750-2400	8350 N. Central, Dallas, TX 75206.
FTX	Finetex, Inc	201-797-4686	418 Falmouth Ave., Elmwood Park, NJ 07407.
	Firestone Tire & Rubber Co.:		
FRF	Firestone Fibers & Textile Co.	804-541-2000	P.O. Box 450, Hopewell, VA 23860.
FRS	Firestone Synthetic Rubber & Latex Co. Div.	216-379-7495	381 West Wilbeth Road, Akron, OH 44301.
FST	First Chemical Corp	601-762-0870	P.O. Box 1427, Pascagoula, MS 39567.
FPC	Fiambeau Paper Corp	715-762-3231	200 N. First Avenue Park Falls, WI 54552.
FLM	Fleming Laboratories, Inc	704-372-5613	2215 Thrift Rd., Charlotte, NC 28234.
CIK	Flint Ink Corp., Cal/Ink Div	415-525-1188	1404-4th St., Berkeley, CA 94710.
FTE	Foot Mineral Co	215-363-6500	Route 100, Exton, PA 19341.
FOR	Formosa Plastics Corp: Louisiana	504-356-3341 201-966-6980	P.O. Box 271, Baton Rouge, LA 70821. and 66 Hanover Rd., Florham Park, NJ 07932.
FJI	Foy-Johnston, Inc	513-831-4270	1776 Mentor Ave., Cincinnati, OH 45212.
FKE	Frank Enterprises, Inc	614-861-7010	1960 Birkdale Dr. Columbus, OH 43232.
FLN	Franklin International	614-443-0241	2020 Bruck St., Columbus, OH 43207.

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Synthetic organic chemicals alphabetical directory of manufacturers, by company, 1986

<i>Identifi- cation Code</i>	<i>Name of company</i>	<i>Telephone number</i>	<i>Office address</i>
FRE	Freeman Chemical Corp	414-284-5541	217 Freeman Dr. Port Washington, WI 53074.
FB	Fritzsche Dodge & Olcott, Inc	212-929-4100	76-9th Ave., New York, NY 10011.
FLH	H.B. Fuller Co	612-645-3401	3530 Lexington Ave. N., St. Paul, MN 55126.
COO	H.B. Fuller Co	617-658-3351	820 Woburn Street Wilmington, MA 01867
GAF	GAF Corp., Chemical Corp	201-862-2600	P.O. Box 12, Linden, NJ 07036.
GLX	Galxle Chemical Corp	201-279-0558	26 Piercy St., Paterson, NJ 07524.
GAN	Gane's Chemicals, Inc	212-391-2580	1114 6th Avenue New York, NY 10036.
GAY	Gaylord Container	206-254-0922	P.O. Box 4266 Vancouver, WA 98662
GNR	Genencor, Inc	415-588-3475	180 Kimball Way, S. San Francisco, CA 94080.
GE	General Electric Co	614-622-5310	1350 S. Second St., Coshocton, OH 43812
		413-494-4793	and 1 Plastics Ave., Pittsfield, MA 01201.
GEI	Insulating Materials	518-385-9362	RV-28, 1 Campbell Rd., Schenectady, NY 12345.
SPD	Silicone Products Div	518-237-3330	Mechanicville Rd., Waterford, NY 12188.
GNF	General Foods Manufacturing Corp., Maxwell House Div.	201-420-3432	1125 Hudson St., Hoboken, NJ 07030.
GRG	P D George Co	314-621-5700	5200 N. Second St., St. Louis, MO 63147.
GGC	Georgia Gulf Corp: Bound Brook Div	404-395-4549	400 Perimeter Ctr., Terr. Suite 595, Atlanta, GA 30348.
	Houston Div	404-395-4549	400 Perimeter Ctr., Terr. Suite 595, Atlanta, GA 30348.
	Plaquemine Div	404-395-4549	400 Perimeter Ctr., Terr. Suite 595, Atlanta, GA 30348.
	PVC Compound Div	404-395-4500	P.O. Box 629, Evergreen Rd., Plaquemine, LA 70765.
	Georgia-Pacific Corp.:		
PSP	Bellingham Div	206-733-4410	P.O. Box 1236, Bellingham, WA 98227.
GP	Resins Inc	404-521-4000	133 Peachtree St. NE., Atlanta, GA 30303.
TNI	The Gillette Co., Chemical Div	617-421-7000	3500 W. 16th St., N. Chicago, IL 60064.
GBF	Gist-Brocades, USA, Inc	704-527-9000	5550-77 Center Dr., Charlotte, NC 28224.
GIV	Givaudan Corp	201-365-8000	100 Delawanna Ave., Clifton, NJ 07014.
GLD	Glidden Company	216-344-8000	925 Euclid Avenue Cleveland OH 44115
GLY	Glyco, Inc	203-794-2400	488 Main St., Rt. 7 Norwalk, CT 06856.
BFG	B. F. Goodrich Co.: B. F. Goodrich Chemical Group	216-447-6000	6100 Oak Tree Blvd., Cleveland, OH 44131.
HGC	Goodson TSI Joint Venture	513-339-0591	1250 South Union Street Troy, OH 45373
GYR	Goodyear Tire & Rubber Co	216-796-2121	1144 E. Market St., Akron, OH 44316.
	W. R. Grace & Co.:		
GCC	Agricultural Chemicals Group	901-357-2311	P.O. Box 27147, Memphis, TN 38127.
HMP	Hampshire Chemicals Div	617-861-6600	55 Hayden Ave., Lexington, MA 02136.
EVN	Organic Chemicals Div., Evans Chemetics	203-655-8741	90 Tokeneke Rd., Darien, CT 06820.
GRD	Polymers & Chemicals Div	617-801-6600	55 Hayden Ave., Lexington, MA 02173.
GPC	Grain Processing Corp	319-264-4211	P.O. Box 349, Muscatine, IA 52761.
CPC	Grant Industries, Inc	201-791-6700	P.O. Box 360, Elmwood Park, NJ 07407.
GTL	Great Lakes Chemical Corp	317-463-2511	P.O. Box 2200, Hwy. 52, N.W. Lafayette, IN 47906.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table A-1—Continued

Synthetic organic chemicals alphabetical directory of manufacturers, by company, 1986

Identifi- cation Code	Name of company	Telephone number	Office address
GNW	Greenwood Chemical Co	703-456-6832	State Hwy. #690, Greenwood, VA 22943.
GDC	Gresco, Inc	919-475-8101	216 E. Holly Hill Rd., Thomasville, NC 27360.
GRV	Guardman Chemicals, Inc	616-452-5181	1350 Steele Ave., S.W., Grand Rapids, MI 49507.
GSS	Gulf States Steel, Inc	205-543-6201	174 South 26th Street Gadsden AL 35904.
HAR	Haarmann & Reimer Corp	201-686-3132	70 Diamond Rd., Springfield, NJ 07081.
HAL	C. P. Hall Co	312-767-4600	7300 S. Central Ave., Chicago, IL 60638.
HOC	Halocarbon Products Corp	201-343-8703	82 Burlows Ct., Hackensack, NJ 07601.
HTM	Haltermann Ltd. Co	713-452-5951	16717 Jacintoport Blvd., Houston, TX 77015.
FOC	Handschy Industries, Inc., Farac Varnishes & Chemicals	312-597-7990	13601 S. Ashland Ave., Riverdale, IL 60627-1099.
HAN	Hanna Chemical Coatings Corp	614-294-3361	1313 Windsor Ave., P.O. Box 147, Columbus, OH 43216.
HSH	Harshaw/Filtrol Partnership	216-292-9200	3400 Band St., Louisville, KY 40212.
HRT	Hart Products Corp	201-433-6662	173 Sussex St., Jersey City, NJ 07302.
HCC	Hatco Chemical Co	201-738-1000	King George Post Rd., Fords, NJ 08863.
HKY	Hawkeye Chemical Co	319-243-5800	P.O. Box 899, Clinton, IA 52732.
HAP	Helmerich & Payne, Inc., Natural Gas Odorizing Div	713-424-5568	3601 Decker Dr., P.O. Box 1429, Baytown, TX 77520.
SCP	Henkel Corp	612-828-8000	7900 W. 78th St., Minneapolis, MN 55435.
HPC	Hercules, Inc	302-594-5000	Hercules Plaza, Wilmington, DE 19894.
HER	Heresite-Saekaphen, Inc	414-684-6646	822 S. 14th St., Manitowoc, WI 54220.
HTN	Heterene Chemical Corp	201-278-2000	790-21st Ave., Paterson, NJ 07513.
HEU	Heubach Inc	201-242-1800	Heubach Ave., Newark, NJ 07114.
HEC	Hewchem	601-863-6600	P.O. Box 188 Gulfport, MS 39501.
HEW	Hewitt Soap Co., Inc	513-253-1151	333 Linden Ave., Dayton, OH 45403.
HEX	Hexagon Laboratories, Inc	212-324-7550	4166 Boston Rd., Bronx, NY 10475.
HXL	Hexcel Corp Hexcel Chemical Products: 818-882-3022 616-772-2193		20701 Nordhoff, Chatsworth, CA 91311. 215 N. Centennial, Zeeland, MI 49464.
HIP	Fine Organics Corp	201-472-6800	205 Main St. Lodi, NJ 07644.
	High Point Chemical Corp	919-884-2214	601 Taylor Ave., High Point, NC 27261.
SDG	Hill Petroleum Company	713-923-3563	P.O. Box 5038 Houston, TX 77262-5038
HIM	Himont, U.S.A., Inc	302-594-5500	1313 N. Market St., Wilmington, DE 19894.
HDG	Hodag Chemical Corp	312-675-3950	7247 N. Central Park Ave., Skokie, IL 60076.
HOF	Hoffmann-LaRoche, Inc	201-235-5000	340 Kingsland St., Nutley, NJ 07110.
HCP	Honig Chemical & Processing Corp.	201-344-0881	414 Wilson Ave., Newark, NJ 07105.
EFH	E. F. Houghton & Co	215-666-4000	Madison & Van Buren Aves., Valley Forge, PA 19482.
HML	Hummel Chemical Co., Inc	201-754-1800	P.O. Box 250, S. Plainfield, NJ 07080.
HMY	Humphrey Chemical Co	203-281-0012	45 Divine Street N. Haven, CT 06473-0325.
HNT	Huntington Laboratories, Inc	219-356-8100	970 E. Tipton St., Huntington, IN 46750.
HUS	Husky Industries, Inc	404-393-1430	P.O. Drawer 1, Dickinson, ND 58601.
ICI	ICI Americas, Inc	302-575-3000	Concord Pike & Murphy Rd., Wilmington, DE 19897.
	Chemicals Div	302-575-3000	Wilmington, DE 19897.
RAY	ITT Rayonier, Inc	203-348-7000	1177 Summer St., Stamford, CT 06904.
IGC	Indiana Gas & Chemical Corp	812-232-0231	1341 Hulman St., Terre Haute, IN 47808.
IND	Indol Color Co., Inc	201-541-4159	1029 Newark Ave., Elizabeth, NJ 07201.

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Synthetic organic chemicals alphabetical directory of manufacturers, by company, 1986

<i>Identifi- cation Code</i>	<i>Name of company</i>	<i>Telephone number</i>	<i>Office address</i>
IDC	Industrial Color, Inc	815-722-7402	50 Industry Ave., Bldg. 28, Joliet, IL 60435.
INL	Inland Steel Co	219-392-5408	3210 Watling, Street E. Chicago, IL 46312.
WM	Inolex Chemical Co	215-271-0800	Jackson & Swanson Sts., Philadelphia, PA 19148.
ENP	Insilco Corp.: Enterprise Co	312-541-9000	1191 S. Wheeling Rd., Wheeling, IL 60090.
SPC	Sinclair Paint Co. Div	213-268-2511	6100 South Garfield Ave., Los Angeles, CA 90040.
REZ	Interez, Inc	502-585-8011	P.O. Box 37600 Louisville, KY 40233.
IFF	International Flavor & Fragrances Inc.	212-765-5500	1515 Highway #36 Union Beach, NJ 07735.
IMC	International Minerals & Chemical Corp. ..	812-232-0121	P.O. Box 207, Terre Haute, IN 47808.
	Industrial Chemicals Div	312-566-2600	421 E. Hawley St., Mundelein, IL 60060.
IPC	Interplastic Corp	612-331-6850	2015 NE Broadway, Minneapolis, MN 55413.
CCA	Interstab Chemicals, Inc	201-247-2202	500 Jersey Ave., New Brunswick, NJ 08903.
IOV	Iovite, Inc	312-481-8900	21625 Oak St., Matteson, IL 60443.
IRI	Ironslides Co	614-224-2228	270 W. Mound St., Columbus, OH 43215.
JRC	Jarchem Industries, Inc	201-344-0600	40 Ball St., Newark, NJ 07105.
JFR	George A. Jeffreys & Co., Inc	703-389-8220	P.O. Box 909, Salem, VA 24153.
JRG	Andrew Jergens Co	513-421-1400	2535 Spring Grove Ave., Cincinnati, OH 45214.
JTO	Jetco Chemicals, Inc	214-872-3011	P.O. Box 1898, Corsicana, TX 75110.
UPF	Jim Walter Resources, Inc., CIC Div.	205-254-7835	P.O. Box 5327, Birmingham, AL 35207.
MRX	Johnson Matthey, Inc.:	201-373-7801	1200 Grove St., Irvington, NJ 07111.
	Pigments Dept	201-373-7801	1200 Grove St., Irvington, NJ 07111.
	Biomedical Products	215-648-8500	2002 Nolte Dr. W. Deptford, NJ. 08066.
JNS	S. C. Johnson & Son, Inc	414-631-2000	1525 Howe St., Racine, WI 53402.
JOB	Jones-Blair Co	214-353-1600	2728 Empire Central, Dallas, TX 75045.
JOR	Jordan Chemical Co	215-583-7000	1830 Columbia Ave., Folcroft, PA 19032.
KAI	Kaiser Aluminum & Chemical Corp.	415-271-3300	P.O. Box 337, Gramercy, LA 70052.
KLM	Kalama Chemical, Inc	206-682-7890	Suite 1110, Bank of California Center, Seattle, WA 98164.
KAN	Kanasco, Ltd	301-789-7800	6110 Robinwood Road, Baltimore, MD 21125.
KMP	Kelly-Moore Paint Co., Inc	415-592-8337	987 Commercial St., San Carlos, CA 94070.
KMI	Kemin Industries, Inc	515-266-2111	2100 Maury St., Des Moines, IA 50301.
KPI	Kenrich Petrochemicals, Inc	201-823-9000	140 E. 22nd St., Bayonne, NJ 07002-0032.
KTP	Kent Polymers, Inc	717-455-2021	666 Dietrich Ave., Hazelton, PA 18201.
KYS	Keysor Century Corp	805-259-2360	P.O. Box 308, Saugus, CA 91350.
KCW	Keystone Color Works, Inc	717-854-9541	151 W. Gay Ave., York, PA 17403.
CHF	Kincaid Enterprises, Inc	304-755-3377	P.O. Box 671, Nitro, WV 25143.
KHI	Koch Refining Co	316-832-5500	P.O. Box 2302, Wichita, KS 67201.
KON	H. Kohnstamm & Co., Inc	212-620-4800	161 Avenue of the Americas, New York, NY 10013.
KMC	Komac Paint, Inc	303-534-5191	201 Osage ST., Denver, CO 80204.
KPT	Koppers Co., Inc	412-227-2000	Koppers Bldg., K 601 Pittsburgh PA 15217.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table A-1—Continued

Synthetic organic chemicals alphabetical directory of manufacturers, by company, 1986

<i>Identification Code</i>	<i>Name of company</i>	<i>Telephone number</i>	<i>Office address</i>
LCP	LCP Chemicals: Maine West Virginia, Inc	201-225-4840 304-843-1310	P.O. Box 149, Orrington, ME 04474. P.O. Box Box J, Moundsville, WV 26041.
LTV	LTV Steel Co., Inc	216-622-5000	LTV Steel Bldg., 25 W. Prospect Ave., Cleveland, OH 44115.
LKY	Lake States Div. of Rhineland Paper Co	715-369-4358	515 W. Davenport St., Rhineland, WI 54501.
ARM	LaRoche Industries Inc	404-851-4001	1100 Johnson Ferry Rd. Atlanta GA 30342.
LUR	Laurel Products Corp	215-423-5300	2600 E. Tioga St., Philadelphia, PA 19134.
LII	Lawter International, Inc	312-498-4700	990 Skokie Blvd., Northbrook, IL 60062.
LEA	Leatex Chemical Co	215-739-6324	2722 N. Hancock St. Philadelphia PA 19133
LLI	Lee Laboratories, Inc	804-862-2534	P.O. Box 1658, Petersburg, VA 23805.
SAR	Lekel, Inc	215-521-3800	P.O. Box 56, Essington, PA 19029.
LEV	Lever Brothers Co	212-906-6000	390 Park Ave., New York, NY 10022.
LVR	C. Lever Co., Inc	215-839-8640	736 Dunks Ferry Rd., Bensalem, PA 19020.
LIL	Eli Lilly & Co	317-261-3348	307 E. McCarty St., Indianapolis, IN 46285.
	Eli Lilly Industries, Inc	809-757-4000	Call Box 1198-Pueblo Station, Carolina, PR 00628-1198.
LIC	Lilly Industrial Coatings, Inc	317-634-8512	P.O. Box 946, Indianapolis, IN 46206.
BRD	Lonza, Inc	201-794-2400	22-10 Route 208, Fair Lawn, NJ 07410.
LC	Lord Corp., Chemical Products Group	814-868-3611	2000 W. Grandview Blvd., Erle, PA 16514-0038.
LAS	Los Angeles Soap Co	213-627-5011	617 E. 1st St., Los Angeles, CA 90051.
LCS	Louisiana Chemical Specialties, Inc	504-775-1801	12537 Scenic Hwy., Baton Rouge, LA 70807.
LYP	Lyondell Petrochemical Co	713-652-7200	1221 McKinney, Suite 1600, Houston, TX
MCK	MacKenzie Chemical Works, Inc	516-234-8600	1 Cordello Ave., Central Islip, NY 11722. 77253.
MCC	McCloskey Corp. McCloskey Varnish Co.: McCloskey Varnish Co., Oregon	215-624-4400 503-226-3751	7600 State Rd., Philadelphia, PA 19136. 4155 N.W. Yeon Ave., Portland, OR 97210.
	McCloskey Varnish Co., California	213-726-7272	5501 E. Slanson Avenue, Los Angeles CA 90040.
STG	McCormick & Co., Inc., McCormick-Strange, Flavor Div	301-667-7400	230 Schilling Circle S., Hunt Valley, MD 21031.
MGK	McLaughlin Gormley King Co	612-544-0341	8810-10th Ave., N., Minneapolis, MN 55427.
MNP	McWhorter, Inc	312-428-2657	400 E. Cottage Place, Carpentersville, IL 60110.
MAK	MAK Chemical Corp	317-288-4464	1200 Rochester Ave., Muncie, IN 47307.
SOR	MW Manufacturers, Inc., Southern Resin Div.	703-483-0211	P.O. Box 68, Thomasville, NC 27360.
TZC	Magnesium Elektron, Inc	201-782-5800	500 Point Breeze Road Flemington, NJ 08822.
MGR	Magruder Color Co., Inc	201-242-1300	1029 Newark Ave., Elizabeth, NJ 07201.
MAL	Mallinckrodt, Inc	314-895-2000	675 McDonnell Blvd., Building-10-3-S, St. Louis, MO 63134.
MOC	Marathon Petroleum Co., Texas Refining Div.	419-422-2121	539 S. Main St., Findlay, OH 45840.
MRV	Mariowe-Van Loan Corp	919-886-7126	1511 Joshua Circle, High Point, NC 27261.
MCA	Masonite Corp., Alpine Resin Div	312-750-0900	Atochem Inc. Polymers Div. 266 Harristown Rd., Glen Rock NJ 07452.

APPENDIX A

Table A-1—Continued

Synthetic organic chemicals alphabetical directory of manufacturers, by company, 1986

<i>Identification Code</i>	<i>Name of company</i>	<i>Telephone number</i>	<i>Office address</i>
MYO	Mayo Chemical Co	404-696-6711	5544 Oakdale Rd., Smyrna, GA 30080.
MZC	Mazer Chemicals, Inc	312-244-3410	3938 Porett Dr., Gurnee, IL 60031.
MLC	Melamine Chemicals, Inc	504-473-3121	P.O. Box 748, Donaldsonville, LA 70346.
MRK	Merck & Co., Inc	201-574-4000	P.O. Box 2000, Rahway, NJ 07065.
MER	Merichem Co	713-455-1311	1914 Haden Rd., Houston, TX 77015.
MDP	Merrel Dow Pharmaceuticals, Inc	513-948-9111	10123 Alliance Road Cincinnati OH 45242
MLS	Miles Laboratories, Inc: Biotechnology Group	219-262-7445	1127 Myrtle St., Elkhart, IN 46515.
MIL	Milliken & Co., Milliken Chemical Div.	803-472-9041	P.O. Box 817, Inman, SC 29349.
RPC	Millmaster Onyx Group, Inc., Lyndal Chemical Co. Div.	212-687-2757	1338 Coronet Dr., Dalton, GA 30720.
MMM	Minnesota Mining & Manufacturing Co.	612-736-0940	3M Center 224-6SE, St. Paul, MN 55144.
MIR	Miranol Chemical Co., Inc	201-329-3900	P.O. Box 436, Dayton, NJ 08810.
MSC	Mississippi Chemical Corp Mobay Chemical Corp.:	601-746-4131	P.O. Box 388, Yazoo City, MS 39194.
CHG	Agricultural Chemicals Div	816-242-2345	Hawthorne Rd., Kansas City, MO 64120.
VPC	Dye & Pigment Div	201-686-3700	Mobay Road Pittsburgh, PA 15205.
SM	Mobil Oil Corp.: Gas Liquids Dept Mobil Chemical Co Chemical Products Div Petrochemicals Div	703-849-3000 212-883-4242 201-321-6000 713-590-7700	P.O. Box 900, Dallas, TX 75221. P.O. Box 726, Paramus, NJ 07652. P.O. Box 250, Edison, NJ 08818. World Towers One, 15600 Drummet Blvd., Houston, TX 77032.
MOA	Mona Industries, Inc	201-345-8220	76 E. 24th St., Paterson, NJ 07544.
MON	Monsanto Co	314-694-1000	800 N. Lindberg Blvd., St. Louis, MO 63167.
MCI	Mooney Chemicals, Inc	216-781-8383	2301 Scranton Rd., Cleveland, OH 44113.
MCP	Moretex Chemical Products, Inc	803-583-8441	314 W. Henry St., Spartanburg, SC 29304.
MRF	Morflex Chemical Co., Inc	919-292-1781	2110 High Point Road, Greensboro, NC 27403.
CCW	Morton Thiokol, Inc.: Caretab Div	513-733-2100	2000 West St., Reading, OH 45215.
MRT	Morton Chemical Div	312-807-2000	333 W. Wacker Dr. Chicago, IL 60606.
PYI	Morton Chemical Div	803-244-5351	P.O. Box 2184 Roberts Rd., Greenville, SC 29602.
MHI	Ventron Div	617-774-3100	150 Andover St., Danvers, MA 01923.
MOT	Motomco, Ltd	608-244-2904	P.O. Box 8422, Madison, WI 53708.
PNX	The Murphy-Phoenix Co	216-831-0404	23811 Chagrin Blvd., Beechwood, OH 44122.
NTL	NL Industries, Inc	212-621-9400	1230 Avenue of the Americas, New York, NY 10020.
CHN	NL Chemicals Div	609-443-2000	P.O. Box 700, Hightstown, NJ 08520.
LEM	N-Ren Corp., Cherokee Nitrogen Div	513-871-8800	P.O. Box 429, Pryor, OK 74362.
LEA	Napp Chemicals, Inc	201-773-3900	199 Main St., Lodi, NJ 07644.
NTC	National Casein Co	312-846-7300	601 W. 80th St., Chicago, IL 60620.
NCJ	National Casein of New Jersey	609-829-1880	P.O. Box 226, Riverton, NJ 08077.
USI	National Distillers & Chemicals Corp., U.S. Industrial Chemicals Co	513-530-6500	11500 N. Lake Dr., Cincinnati, OH 45249.
NMC	National Milling & Chemical Co., Inc	215-482-6600	4601 Flat Rock Rd., Philadelphia, PA 19127.
NSC	National Starch & Chemical Corp	201-685-5000	10 Finderne Ave., Bridgewater, NJ 08807.
NTS	National Steel Corp., Great Lakes Plant.	313-297-3601	1 Quality Dr., Ecorse, MI 48229.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table A-1—Continued

Synthetic organic chemicals alphabetical directory of manufacturers, by company, 1986

<i>Identifi- cation Code</i>	<i>Name of company</i>	<i>Telephone number</i>	<i>Office address</i>
NEP	Nepera, Inc	914-782-8171	Route #17, Harriman, NY 10926.
NEV	Neville Chemical Co	412-331-4200	Grand Avenue, Neville Island, Pittsburgh, PA 15225.
NBC	New Boston Coke Corp	614-456-4154	P.O. Box 3128 New Boston, OH 45662.
NCC	Niacet Corp	716-285-1474	400-47th St., Niagara Falls, NY 14304.
NLO	Niklor Chemical Co., Inc	213-830-2253	2060 E. 220th St., Long Beach, CA 90810.
NCP	Niles Chemical Paint Co	616-683-3377	P.O. Box 307, Niles, MI 49120.
	Kordell Industries Div	219-255-9678	1413 Clover Rd., Mishawaka, IN 46544.
CNP	Nipro, Inc	404-823-4240	P.O. Box 2451, Augusta, GA 30913.
NOC	The Norac Co., Inc	818-334-2908	405 S. Motor Ave., Azusa, CA 91702.
	Mathe Div	201-779-4981	169 Kennedy Dr., P.O. Box 2230, Lodi, NJ 07644-0230.
FSN	NOR-AM Chemical Co	302-575-2000	3509 Silverside Road, Wilmington, DE 19803.
NW	Northwestern Chemical Co	312-231-6111	120 N. Aurora St., West Chicago, IL 60185.
NPC	Northwest Petrochemical Corp	206-293-3176	708 N. Texas Rd. - March Point Anacortes, WA 98221.
NOR	Norwich Eaton Pharmaceutical, Inc	607-335-2111	17 Eaton Ave., Norwich, NY 13815.
NBI	Novo Biochemical Industries Inc	919-494-2014	P.O. Box 576, Franklinton, NC 27525.
NOD	Nuodex, Inc	201-981-5000	Turner Place, Piscataway, NJ 08854.
NSW	The Nutrasweet Co	312-982-7000	4711 Golf Rd., Skokie, IL 60076.
CHO	NutriBasics Co	618-654-4424	1310 Mercantile Drive, Highland, IL 62249
NUT	Nutrius, Inc	216-526-5522	8221 Breckville Rd., Brecksville, OH 44141.
OBC	The O'Brien Corp	415-761-2300	450 E. Grand Ave., S. San Francisco, CA 94080.
	Occidental Chemical Corp.:		
HKD	Durez Div	716-696-6000	Walck Rd., N. Tonawanda, NY 14120.
HK	Specialty Chemical Div-	716-286-3000	360 Rainbow Blvd. S., Niagara Falls, NY 14303.
HKP	PVC Div	215-327-6400	P.O. Box 699, Pottstown, PA 19464.
EPI	Ohio Rubber Co., Orthane Div	817-387-0585	1500 I 35-W, Denton, TX 76202.
OMC	Olin Corp	203-356-2000	120 Long Ridge Rd., Stamford, CT 06904.
WAY	Olin Hunt Specialty Products, Inc	201-977-6000	One Wellington Rd., Lincoln, RI 02865.
ONX	Onyx Chemical Co	201-434-1700	190 Warren St., Jersey City, NJ 07302.
ORG	Organics/LaGrange, Inc	312-764-6700	7125 N. Clark St., Chicago, IL 60626.
OCC	Orient Chemical Corp	201-465-0714	121 Tyler St., Port Newark, NJ 07114.
BSW	Original Bradford Soap Works, Inc	401-821-2141	200 Providence St., W. Warwick, RI 02893.
CJO	C. J. Osborn Chemicals, Inc	609-662-0128	820 Sherman Ave., Pennsauken, NJ 08110.
OCF	Owens-Corning Fiberglas Corp	419-248-8000	Fiberglas Tower, Toledo, OH 43659.
PBI	PBI-Gordon Corp	816-421-4070	1217 W. 12th St., Kansas City, MO 64101-9984.
PDG	PDG Glycol	713-838-4521	P.O. Box 3785, Beaumont, TX 77704.
PSG	PMC Specialties Group, Inc	216-356-0700	20525 Center Ridge Rd, Suite 235, Rocky River, OH 44116.
PMP	PMP Fermentation Products, Inc	414-352-3001	7670 N. Port Washington Rd., Milwaukee, WI 53217.
PPG	PPG Industries, Inc	412-434-3131	One PPG Place, Pittsburgh, PA 15272.
PAC	Pacific Anchor Chemical Corp	213-725-1800	5701 S. Eastern Ave. Suite 530, Los Angeles, CA 90040.
PAH	Parish Chemical Co	801-226-2018	145 N. Geneva Rd., Orem, UT 84057.
PD	Parke-Davis Div. of Warner Lambert Co ..	201-540-2000	188 Howard Ave., Holland, MI 49424.

APPENDIX A

Table A-1—Continued

Synthetic organic chemicals alphabetical directory of manufacturers, by company, 1986

Identifi- cation Code	Name of company	Telephone number	Office address
PSC	Passaic Color & Chemical Co	201-279-0400	28-36 Paterson St., Paterson, NJ 07501.
PAT	Pat-Chem, Inc	803-233-3941	11 Worley Rd. Greenville SC 29602.
CHP	C. H. Patrick & Co., Inc	803-244-4831	P.O. Box 2526, Greenville, SC 29602.
PEL	Peiron Corp	312-442-9100	7847 W. 47th St., Lyons, IL 60534.
PAS	Pennwalt Corp	215-587-7000	Three Parkway, Philadelphia, PA 19102.
WTL	Lucidol Div	716-877-1740	1740 Military Rd., Buffalo, NY 14240.
PAR	Pennzoll Co., Penreco Div	713-337-1534	4401 Park Ave., Dickinson, TX 77539.
PKI	Perkins Industries, Inc	913-877-5831	10453 W. 84th Terrace, Lenexa, KS 66214.
BPT	Permethane, Inc	617-531-1880	13 Corwin St., Peabody, MA 01960.
PER	Perry & Derrick Co., Inc	513-351-5800	2510 Highland Ave., Cincinnati, OH 45212.
PST	Perstorp Compounds, Inc	413-584-2472	238 Nonotuck St., Florence, MA 01060.
PST	Perstorp Polyols, Inc	419-729-5448	600 Matzinger Rd., Toledo, OH 43612.
PFN	Pfanstiehl Laboratories, Inc	312-623-0370	1219 Glen Rock Ave., Waukegan, IL 60085.
PCW	Pfister Chemical, Inc	201-945-5400	Linden Ave., Ridgefield, NJ 07657.
PFZ	Pfizer, Inc	212-573-2323	235 E. 42d St., New York, NY 10017.
	Pfizer Pharmaceuticals, Inc	809-846-4300	P.O. Box 628, Barceloneta, PR 00617.
PHR	Pharmachem Corp	215-867-4854	719 Stefko Blvd., P.O. Box 1035 Bethlehem, PA 18016.
PLB	Pharmacia P-L Blochemicals, Inc	414-225-2600	2202 N. Bartlett Ave., Milwaukee, WI 53202.
PDI	Phelps Dodge Industries, Inc	219-456-4444	4300 New Haven Ave., Fort Wayne, IN 46803.
	Phelps Dodge Magnet Wire Co. Div		
PPX	Phillips Paraxylene, Inc	809-864-1515	P.O. Box 1166, Guayama, PR 00655.
PLC	Phillips Petroleum Co	918-661-8600	Phillips Bldg., Bartlesville, OK 74004.
PPR	Phillips Puerto Rico Core, Inc	809-864-1515	P.O. Box 1166, Guayama, PR 00655.
PHC	Phthalchem, Inc	513-681-0099	6675 Beechlands Dr., Cincinnati, OH 45237.
PCI	Piedmont Chemical Industries, Inc	919-885-5131	331 Burton Ave., High Point, NC 27260.
PIC	Pierce Chemical Co	815-968-0747	3747 N. Meridan Rd., Rockford, IL 61103.
PIL	Pilot Chemical Co	213-723-0036	11756 Burke St., Santa Fe Springs, CA 90670.
PKL	Plaskolite, Inc	614-294-3281	P.O. Box 1497, Columbus, OH 43216.
PSL	Plaslok Corp	716-681-7755	3155 Broadway, Buffalo, NY 14227.
PLS	Plastics Engineering Co	414-458-2121	3518 Lakeshore Rd., Sheboygan, WI 53081.
PMC	Plastics Manufacturing Co	214-330-8671	2700 S. Westmoreland, Dallas, TX 75233.
PTC	Polycast Technology Corp	203-327-6010	69 Southfield Ave., Stamford, CT 06902.
PAI	Polymer Applications, Inc	716-875-0775	3445 River Rd., Tonawanda, NY 14150.
PLR	Polysar, Inc:		
	Plastics Div	671-531-9901	29 Fuller St., Leominster, MA 01453.
PVI	Polyvinyl Chemical Industries	671-658-6600	730 Main St., Wilmington, MA 01453.
POP	Pope Chemical Corp	201-279-2702	33-6th Ave., Paterson, NJ 07524.
PRT	Pratt & Lambert, Inc., Paint Div	716-873-6000	P.O. Box 22 Buffalo, NY 14240.
JLP	J. L. Prescott Co	201-777-4200	27 8th St., Passaic, NJ 07055.
PG	Procter & Gamble Co., Procter & Gamble Mfg. Co	513-627-5194	P.O. Box 599, Cincinnati, OH 45201.
PRC	Products Research & Chemical Corp	818-240-2060	5430 San Fernando Rd., Glendale, CA 91209.
KQO	QO Chemicals, Inc	312-850-2330	823 Commerce Dr., Suite 200, Oak Brook, IL 60521.
QCP	Quaker Chemical Corp	215-828-4250	Elm & Lee Sts., Conshohocken, PA 19428-0809.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table A-1—Continued

Synthetic organic chemicals alphabetical directory of manufacturers, by company, 1986

Ident- fication Code	Name of company	Telephone number	Office address
QUN	K. J. Quinn & Co., Inc	617-321-3200	195 Canal St., Malden, MA 02148.
RSA	R.S.A. Corp	914-693-1818	690 Saw Mill River Rd., Ardsley, NY 10502.
RCN	Racon, Inc	316-524-3245	6040 S. Ridge Rd., Wichita, KS 67201.
BLC	Ranbar Technology, Inc., Ball Chemical Co.	412-486-1111	1114 William Flinn Highway, Glenshaw, PA 15116.
RAB	Raymark Corp	203-371-0101	1204 Darlington Ave., Crawfordsville, IN 47933.
MAR	Reed Lignin, Inc	203-625-0701	81 Holly Hill Lane, Greenwich, CT 06830.
RBI	Reeves Brothers, Inc	803-576-1210	P.O. Box 1898, Spartanburg, SC 29304.
REG	Regis Chemical Co	312-967-6000	8210 Austin Ave., Morton Grove, IL 60053.
RCI	Reichhold Chemicals, Inc	914-682-5700	525 N. Broadway, White Plains, NY 10603.
RIL	Relly Tar & Chemical Corp	317-247-8141	151 N. Delaware 1510 Market Square Center St., Indianapolis, IN 46204.
REL	Reliance Universal, Inc., Louisville Resins Div.	502-459-9110	4730 Crittenden Dr. Louisville, KY 40232.
REM	Remington Arms Co., Inc	302-774-1000	615 Asylum St. Bridgeport, CT 06601.
RDA	Rhone-Poulenc, Inc	201-821-2600	P.O. Box 125, Monmouth Junction, NJ 08846.
RCD	Richardson Polymer Corp	203-245-0441	17 Woodland Rd., Madison, CT 06443.
AMS	Ridgway Color Co	814-776-2151	75 Front St., Ridgway, PA 15853.
RTC	Riegel Textile Corp., Riechem Div	803-242-6050	P.O. Box 3478, Greenville, SC 29602.
RIK	Riker Laboratories, Inc. Sub. of 3M Co.	818-341-1300	19901 Nordhoff St., Northridge, CA 91324.
RIV	Riverdale Chemical Co	312-756-2010	220 E. 17th St., Chicago Heights, IL 60411.
ROB	Robeco Chemicals, Inc.,	212-986-6410	99 Park Ave., New York, NY 10016.
ORT	Roehr Chemicals, Inc, Div. of Aceto Corp	718-784-8473	52-20 37th St., Long Island City, NY 11101.
RH	Rohm & Haas Co	215-592-3000	Independence Mall West., Philadelphia, PA 19105.
ROM	Roma Color, Inc	617-676-3481	749 Quequechan St., Fall River, MA 02722.
ROU	Rouge Steel Co	313-322-8774	3001 Miller Rd. Dearborn, MI 48124.
RUC	Rubicon, Inc	302-575-3596 504-673-6141	P.O. Box 751, Wilmington, DE 19897 and P.O. Box 517, Gelsmar, LA 70734.
RUO	Ruco Polymer Corp	516-931-8104	New South Rd., Hicksville, NY 11804.
NES	Ruetgers-Nease Chemical Co	814-238-2424	201 Struble Rd., State College, PA 16801.
SBP	SBS Products Inc	517-799-4941	302 Waller St., P.O. Box 1387, Saginaw, MI 48605.
SCM	SCM Gildco Organics	904-768-5800	P.O. Box 389, Jacksonville, FL 32201
SDS	S.D.S. Biotech Corp	216-357-3000	7528 Auburn Rd., P.O. Box 348, Painesville, OH 44077.
SBS	SBS Product Inc	517-799-4941	302 Waller St., Saginaw, MI 48605.
SCM	SCM Gildco Organics	904-768-5800	P.O. Box 389 Jacksonville, FL 32201.
SOS	SSC Industries, Inc	404-762-9651	1550 E. Taylor Ave., East Point, GA 30344.
NPR	Safeway Stores, Inc	415-944-4478	2800 Ygnacio Valley Rd., Walnut Creek, CA 94598.
STX	St. Croix Petrochemical Corp	809-778-6450	P.O. Box 6801, Christianstad, St. Croix, U.S., VI 00820.
SLM	Salem Oil & Grease Co	617-745-0585	60 Grove ST., Salem, MA 01970.

APPENDIX A

Table A-1—Continued

Synthetic organic chemicals alphabetical directory of manufacturers, by company, 1986

<i>Identification Code</i>	<i>Name of company</i>	<i>Telephone number</i>	<i>Office address</i>
SAL	Salsbury Laboratories, Inc	515-257-2422	2000 Rockford Rd., Charles City, IA 50616.
SBG	Samuel Bingham Co	312-298-6777	479 Business Center Dr., Suite 109 Franklin Park, IL 60131.
S	Sandoz Chemicals Corp	704-372-0210	4000 Monroe Rd., Charlotte, NC 28205.
S	Sandoz, Inc., Colors & Chemicals Div	704-372-0210	4000 Monroe Rd., Charlotte, NC 28205.
ZOC	Sandoz Crop Protection	312-670-4500	P.O. Box 220, Wasco, CA 93280.
SCN	Schenectady Chemicals, Inc	518-370-4200	P.O. Box 1046, Schenectady, NY 12306.
SBC	Scher Chemicals, Inc	201-471-1300	Industrial West, Clifton, NJ 07012.
SCH	The Schering Corp	201-558-4000	1011 Morrie Ave., Union, NJ 07083.
SCO	Scholler, Inc	215-739-0900	P.O. Box 26968, Philadelphia, PA 19134.
SPR	Scientific Protein Laboratories	608-849-5944	700 E. Main St., Waunakee, WI 53597.
SPA	Scott Paper Co	215-521-5000	P.O. Box 925, Everett, WA 98206.
SEA	Seaboard Chemicals, Inc	617-745-1915	30 Foster St., Salem, MA 01970.
SRL	G. D. Searle & Co	312-982-7000	5200 Old Orchard Rd., Skokie, IL 60077.
SKP	Shakespeare Monofilament Div	803-754-7011	6111 Shakespeare Rd., Columbia, SC 29240.
SHO	Shell Oil Co	713-241-1242	P.O. Box 3105, Houston, TX 77002.
SHC	Shell Chemical Co	713-241-1242	P.O. Box 3105, Houston, TX 77002.
SGO	Shenango, Inc	412-771-4400	200 Neville Rd., Pittsburgh, PA 15225-1690.
SHP	Shepherd Chemical Co	513-731-1110	4900 Beech St., Cincinnati, OH 45212.
SHX	Sherex Chemical Co., Inc	614-764-6500	5777 Frantz Rd., Dublin, OH 43017.
	The Sherwin-Williams Co.:		
SW	Sherwin-Williams Co	216-566-2000	11541 S. Champlain, Chicago, IL 60628.
SW	Sherwin-Williams Co	216-566-2000	Boggs Lane South Richmond, KY 40475.
SW	Sherwin-Williams Co	216-566-2000	2802 W. Miller Rd., Garland TX 75040.
BAL	Consumer Div	301-625-8247	2325 Hollins Ferry Rd., Baltimore, MD 21230.
SHT	Shintech, Inc	713-965-0713	24 Greenway Plaza, Suite 811, Houston, TX 77046.
SMP	J. R. Simplot Co	208-336-2110	P.O. Box 912 Pocatello, ID 83204.
SIM	Simpson Timber Co	206-292-5000	2301 N. Columbia Blvd., Portland, OR 97217.
GFS	G. Frederick Smith Chemical Co	614-881-5501	P.O. Box 23214, Columbus, OH 43223.
SK	SmithKline Chemicals	215-270-7003	900 River Rd., Conshohocken, PA 19428.
SMO	Smooth-On, Inc	201-647-5800	1000 Valley Rd., Gillette, NJ 07933.
SLT	Soltex Polymer Corp	713-522-1781	P.O. Box 1000, Deer Park, TX 77536.
SLC	Soluol Chemical Co., Inc	401-821-8100	Green Hill & Market Sts., P.O. Box 112, W. Warwick, RI 02893.
SAC	Southeastern Adhesives Co	704-754-3493	P.O. Box 2070, Lenoir, NC 28645.
SOP	Southern Chemical Products Co	912-746-5147	430 Lower Boundary St., Macon, GA 31297.
	Southland Corp.:		
ACT	Chemical Div	214-333-2151	7666 W. 63d St., Summit, IL 60501.
SOL	Fine Chemical Div	214-828-7011	2828 N. Haskell Ave., Dallas, TX 75204.
SWR	Southwestern Refining Co., Inc	512-884-8863	P.O. Box 9217, Corpus Christi, TX 78469.
SPL	Spaulding Fibre Co., Inc., Industrial Plastics Div.	716-692-2000	310 Wheeler St., Tonawanda, NY 14150.
ASL	SpecialtyChem Products Corp	715-735-9033	2 Stanton St., Marinette, WI 54143.
SOI	Specialty Organics, Inc	818-962-2008	5623 N. 4th St., Irwindale, CA 91706.
IPP	Spectrachem Corp	201-595-8181	200 Sheridan Ave., Paterson, NJ 07512.
TRD	Squibb Manufacturing, Inc	809-852-1255	P.O. Box 609, Humacao, PR 00661.
SCC	Standard Chlorine of Delaware, Inc	201-997-1700	1035 Belleville Turnpike, Kearny, NJ 07032.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table A-1—Continued

Synthetic organic chemicals alphabetical directory of manufacturers, by company, 1986

Ident- fication Code	Name of company	Telephone number	Office address
SOH	Standard Oil Chemical Co	216-586-4141	200 Public Square, (31-4154-N) Cleveland, OH 44114.
SIO	Standard Oil Co	419-226-2300	1150 S. Metcalf St., Lima, OH 45804.
SIF	Standard Oil Co., Filon Div., Engineered Materials Co.	213-757-5141	12333 S. Van Ness Ave., Hawthorne, CA 90250.
SIC	Standard Oil Co., Silmar Div., Engineered Materials Co.	213-757-1801	12333 S. Van Ness Ave., Hawthorne, CA 90250.
	Stauffer Chemical Co.:		
SFA	Agricultural Product Div	203-222-3000	Nyala Farm Rd., Westport, CT 06881.
SFI	Chlor Alkali Products	203-222-3000	Nyala Farm Rd., Westport, CT 06880.
SFS	Specialty Chemicals Group	203-222-3000	Nyala Farm Rd., Westport, CT 06881.
SWS	Stauffer-Wacker Silicones Div	517-263-5711	3301 Sutton Rd., Adrian, MI 49221.
STP	Stepan Chemical Co	312-446-7500	RR #1, Elwood, IL 60421 and 100 W. Henter Ave., Maywood, NJ 07607.
SD	Sterling Drug, Inc	212-907-2000	2144 E. State St., Trenton, NJ 08619.
SDH & TMS	SDI Divestiture Corp	513-351-0181	2345 Langdon Farm Rd., Cincinnati, OH 45237.
SDW	Sterling Organics Div	212-907-2000	90 Park Ave., New York, NY 10016.
SD	Sterling Pharmaceuticals, Inc	212-907-2000	P.O. Box 11247, Barcelonita, PR 00617.
PPL	Sterling Engineered Products	207-784-9111	Plonite Road, Auburn, ME 04210.
CIN	Stockhausen, Inc	919-378-9393	2408 Doyle St., Greensboro, NC 27406.
	Sun Chemical Corp.:		
SNW	Chemicals Div	201-224-4600	P.O. Box 70, Chester, SC 29706.
SNA	Pigments Div	212-986-5500	411 Sun Ave., Cincinnati, OH 45232.
SUN	Sun Company, Inc	215-977-6358	1801 Market St., Philadelphia, PA 19103.
SNO	SunOlin Chemical Co	302-792-3100	P.O. Box 609, Claymont, DE 10703.
RAS	Surface Coatings, Inc	617-933-4200	100 Eames St., Wilmington, MA 01887.
IOC, JSC & TCC	Sybron Chemical, Inc	609-893-1100	P.O. Box 66, Birmingham Rd., Birmingham, NJ 08011.
SYL	Sylvachem Corp	904-764-1711	P.O. Box 690, Jacksonville, FL 32218.
INP	Synalr Corp	615-698-8801	2003 Amnicola Hwy., Chattanooga, TN 37406.
BUC	Synalloy Corp., Blackman Uhler Chemical Div	803-585-3661	P.O. Box 5627, Croft Industrial Park, Spartanburg, SC 29304.
SRV	Synray Corp	201-245-2600	209 N. Michigan Ave., Kenilworth, NJ 07033.
HFT	Syntex Agribusiness, Inc., Nutrition & Chemical Div	417-866-7291	P.O. Box 1246 S.S.S., Springfield, MO 65805.
ARA	Syntex Chemicals, Inc	303-442-1926	2075 N. 55th St., Boulder, CO 80302.
SYP	Synthetic Products Co., Plastic Specialties & Technology, Div	216-531-6010	1000 Wayside Rd., Cleveland, OH 44110.
SYT	Synthron, Inc	704-437-8611	P.O. Box 1111, Morganton, NC 28655.
TEK	Teknor Apex Co	401-725-8000	505 Central Ave., Pawtucket, RI 02861.
TLI	Teledyne Industries, Inc., Teledyne McCormick Selph.	408-637-3731	3601 Union Rd., Hollister, CA 95024-0006.
TOC	Tenneco Oil Co	713-757-2635	P.O. Box 2511, Houston, TX 77001.
TEN	Tennessee Chemical Co	615-496-3331	1 Ocoee St., Copperhill, TN 37317.
TVA	Tennessee Valley Authority, NFDC, TVA, OACD, Div. of Developmental Production.	205-386-2379	Muscle Shoals, AL 35660.
TU	Tenn-USS Chemicals Co	713-884-4400	P.O. Box 600, Pasadena, TX 77501.
TER	Terra International, Inc	712-277-1340	Terra Centre, 600-4th St., Sioux City, IA 51101.
TER	Terra Nitrogen, Inc	712-277-1340	Terra Centre, 600-4th St., Sioux City, IA 51101.

APPENDIX A

Table A-1—Continued

Synthetic organic chemicals alphabetical directory of manufacturers, by company, 1986

<i>Identifi- cation Code</i>	<i>Name of company</i>	<i>Telephone number</i>	<i>Office address</i>
TX	Texaco, Inc., Texaco Chemical Co	713-666-8000	4800 Fournace Place, Bellaire, TX 77401.
TUS	Texaco Butadiene Co	713-666-8000	P.O. Box 430, Bellaire, TX 77401.
TSA	Texas Alkyls, Inc	713-479-8411	P.O. Box 600, Deer Park, TX 77536.
TCR	Texas City Refining, Inc	409-945-4451	P.O. Box 1271, Texas City, TX 77592.
TPC	Texas Petrochemicals Corp	713-477-9211	8600 Park Place Blvd., Houston, TX 77017.
TXS	Texstyrene Plastics, Inc	817-831-3541	3607 N. Sylvania Ave., Fort Worth, TX 76111.
TMH	Thompson Hayward Chemical Co	913-321-3131	5200 Speaker Rd., Kansas City, KS 66106.
TWD	Tonawanda Coke Corp	716-876-6222	P.O. Box A-500 Tonawanda, NY 14151
BAX	Travenol Laboratories, Inc	312-948-2000	Route 120 Wilson Rd. Round Lake, IL 60057.
TRI	Triad Chemical	504-473-9231	P.O. Box 310, Donaldsonville, LA 70346.
TRO	Troy Chemical Co	201-589-2500	One Avenue L, Newark, NJ 07105.
TUL	Tull Chemical Co., Inc	205-831-1154	P.O. Box 3246, Oxford, AL 36203.
TLC	Twin Lake Chemical, Inc	716-433-3824	540 Mill St., P.O. Box 411, Lockport, NY 14094.
UPM	UOP, Inc	312-391-2000	25 E. Algonguin Road, Des Plaines, IL 60017-5017.
UHL	Paul Uhlich & Co., Inc	914-478-2000	1 Railroad Ave., Hastings-on-Hudson, NY 10706.
UNG	Ungerer & Co	201-628-0600	4 Bridgewater Lane, Lincoln Park, NJ 07035.
DRL	Unichema Chemical, Inc	201-327-6100	4650 S. Racine Ave., Chicago, IL 60609.
WTH	Union Camp Corp	201-628-2000	875 Harger Street Dover, OH 44622.
NCI	Chemical Products Div	201-628-2000	1600 Valley Rd., Wayne, NJ 07470.
NCI	Terpene & Aromatics Div	201-628-2000	P.O. Box 60369, Jacksonville, FL 32236.
UCC	Union Carbide Corp	203-794-3113	39 Old Ridgebury Rd., Danbury, CT 06817-001.
UOC	Union Oil Co. of California	213-977-7746	461 S. Boylston St., Los Angeles, CA 90017.
UTP	Union Texas Petroleum	713-968-2366	1330 Post Oak Blvd. Houston Texas 77252-2120.
USR	Uniroyal, Inc., Uniroyal Chemical Div	203-573-3886	World Headquarters, Middlebury, CT 06749
UNN	United Chemical Corp. of Norwood	617-762-4057	Endicott St., Norwood, MA 02062.
UNO	United Erle, Inc	814-456-7561	438 Huron St., Erle, PA 16502.
VAL	United Merchants & Manufacturers, Inc., Valchem Div.	201-837-1700	1650 Palsades Ave., Teaneck, NJ 07666.
UTC	Unitex Chemical Corp	919-378-0965	520 Broome Rd. Greensboro, N.C 27406.
USB	U.S. Borax & Chemical Corp., U.S. Borax Research Corp.	213-381-5311	3075 Wilshire Blvd., Los Angeles, CA 90010.
NWP	USI Chemicals Co. Inc	402-633-5682	1150 NorthLake Dr. Cincinnati, OH 45249.
USS	U.S. Steel Corp.:		
	Clairton Plant	412-433-5425	600 Grant St., Rm. 1910, Pittsburgh, PA 15230.
	Gary Works	412-433-5425	600 Grant St., Rm. 1910, Pittsburgh, PA 15230.
	Geneva Plant	412-433-5425	600 Grant St., Rm. 1910, Pittsburgh, PA 15230.
	USS Chemicals Div	412-433-7636	600 Grant St., Rm. 2880, Pittsburgh, PA 15230.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table A-1—Continued

Synthetic organic chemicals alphabetical directory of manufacturers, by company, 1986

Identifi- cation Code	Name of company	Telephone number	Office address
UPJ	The Upjohn Co	616-323-4000	7000 Portage Rd., Kalamazoo, MI 49001
CWN	Fine Chemicals	203-281-2722	410 Sackett Point Rd., North Haven, CT 06473.
VSV	Valentine Sugars, Inc., Valite Div	504-532-2541	Rt 2, Box 625, Lockport, LA 70374.
VCM	Vanchem, Inc	716-434-2624	1 North Transit Rd., Lockport, NY 14094.
VDM	Van De Mark Chemical Co., Inc	716-433-6764	1 N Transit Rd., Lockport, NY 14094.
VNC	Vanderbilt Chemical Corp	203-744-3900 203-853-1400	31 Taylor Ave., P.O. Box 20, Bethel, CT 06801 and Rt. #2, Box 54, Murray, KY 42071.
VND	Van Dyk, Div. of Mallinckrodt, Inc	201-759-3225	Main & William Sts., Belleville, NJ 07109.
INL	Van Leer Containers, Inc	312-568-3535	4300 W. 130th St., Chicago, IL 60658.
VEL	Velsicol Chemical Corp	312-698-9700	341 E. Ohio St., Chicago, IL 60611.
VTC	Vertac Chemical Corp	901-767-6851	P.O. Box 69, Jacksonville, AR 72076.
GRL	Vestal Laboratories, Inc	314-535-1810	5035 Manchester Ave., St. Louis, MO 63110.
VIK	Viking Chemical Co	612-333-0394	838 Baker Bldg., Minneapolis, MN 55402.
VIN	Vineland Chemical Co., Inc	609-691-3535	W. Wheat Rd., Vineland, NJ 08360.
VCC	Vinings Chemical Co	404-436-1542	3950 Cumberland Pkwy., Atlanta, GA 30339.
VGC	Virginia Chemicals, Inc	804-483-7000	801 Water Street, Portsmouth, VA 23704.
VST	Vista Chemical Co	713-531-3200	15990 N. Barker's Landing Rd., Houston, TX 77224.
VTM	Vitamins, Inc	312-861-0700	200 E. Randolph Dr., Chicago, IL 60601.
VIT	Vititek Corp	805-725-5637	Rt. #2, Box 580, Delano, CA 93215.
FRO	Vulcan Materials Co., Chemicals Div.	205-877-3000	P.O. Box 7689, Birmingham, AL 35223.
VYN	Vygen Corporation	216-998-1120	Middle Road Ashtabula, OH 44004.
WJ	Warner-Jenkinson	314-889-7600	2526 Baldwin St., St. Louis, MO 63106.
WCA	West Coast Adhesives Co	503-286-3515	11104 NW Front Ave., Portland, OR 97231.
EW	Westinghouse Electric Corp., Insulating Materials Div.	412-864-7960	Manor, PA 15665.
WAG	West Design Chemical, Inc	609-921-0501	1000 Herrontown Road Princeton, NJ 08540.
WPG	WestPoint Pepperell, Inc	404-645-4753	1900 Cunningham Dr., Opelika, AL 36801.
WVA	Westvaco Corp	212-688-5000	P.O. Box 70848, Charleston Heights, SC 29415.
WRD	Weyerhaeuser Co	715-384-2141	1401 E. 4th St., Marshfield, WI 54449.
WPS	Wheeling-Pittsburgh Steel Corp	412-288-3600	Four Gateway Center, Pittsburgh, PA 15230.
WBG	The White & Bagley Co	617-791-3201	P.O. Box 706, Worcester, MA 01613.
WCC	White Chemical Corp	201-621-4100	660 Frelinghuysen Ave., Newark, NJ 07114.
WHL	Whitmoyer Laboratories, Inc	717-866-2151	99 S. Fairlane Ave., Myerstown, PA 17067.
WTK	Whittaker Corp., Helco Chemicals Div	717-476-0353	Rt. 611, Delaware Water Gap, PA 18327.
WHW	Whittmore-Wright Co., Inc	617-242-1180	62 Alford St., Boston, MA 02129.
WLM	Wilmington Chemical Corp	302-658-3515	Pyles Lane, Wilmington, DE 19899.
WTC	Witco Chemical Corp	201-573-2800	155 Tice Blvd., Woodcliff Lake, NJ 07675.
WCL	Wright Chemical Corp	919-251-0234	255 North Front Street Wilmington, NC 28402.
WYK	Wyckoff Chemical Co., Inc	616-637-8474	1421 Kalamazoo St., S. Haven, MI 49090.

APPENDIX A

Table A-1—Continued

Synthetic organic chemicals alphabetical directory of manufacturers, by company, 1986

<i>Ident- fication Code</i>	<i>Name of company</i>	<i>Telephone number</i>	<i>Office address</i>
WYC	Wycon Chemical Co	307-637-2714	P.O. Box 1287, Cheyenne, WY 82003.
WYT	Wyeth Laboratories, Inc., Wyeth Laboratories Div. of American Home Products Corp.	215-341-3924	P.O. Box 13745 Philadelphia, PA 19101.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

APPENDIX B
CYCLIC INTERMEDIATES;
GLOSSARY OF SYNONYMOUS NAMES

SYNTHETIC ORGANIC CHEMICALS, 1986

Table B-1

Cyclic Intermediates: Glossary of synonymous names

<i>Common name</i>	<i>Standard (chemical abstracts) name</i>
A acid	3,5-Dihydroxy-2,7-naphthalenedisulfonic acid.
Acetyl-p-phenylenediamine	4'-Aminoacetanilide.
1,2,4-acid	4-Amino-3-hydroxy-1-naphthalenesulfonic acid (1-Amino-2-naphthol-4-sulfonic acid).
Acid yellow 9	6-Amino-3,4'-azodibenzenesulfonic acid.
p-Aminobenzenesulfonic acid	Sulfanilic acid and salt.
m-Aminobenzoyl J acid	4-Hydroxy-7-(m-aminobenzamido)- 2-naphthalenesulfonic acid.
Aminoepsilon acid	8-Amino-1,6-naphthalenedisulfonic acid.
Amino G acid	7-Amino-1,3-naphthalenedisulfonic acid.
Amino J acid	6-Amino-1,3-naphthalenedisulfonic acid.
Amino R sal	3-Amino-2,7-naphthalenedisulfonic acid.
Aniline oil	Aniline.
Anthraflavic acid	2,6-Dihydroxyanthraquinone.
Anthrarufin	1,5-Dihydroxyanthraquinone.
Armstrong & Wynne's acid	4-Hydroxy-2-naphthalenesulfonic acid.
B acid	5-Amino-4-hydroxy-1,7-naphthalenedisulfonic acid.
2B acid	6-Amino-4-chloro-m-toluenesulfonic acid.
4B acid	6-Amino-m-toluenesulfonic acid.
Benzal chloride	α , α -Dichlorotoluene.
Benzanthrone	7H-Benz[de]anthracen-7-one.
Benzotrichloride	α , α , α -Trichlorotoluene.
Bisphenol A	4,4'-isopropylidenediphenol.
B.O.N.	3-Hydroxy-2-naphthoic acid.
Broenner's acid	6-Amino-2-naphthalenesulfonic acid.
Bromamine acid	1-Amino-4-bromo-2-anthraquinonesulfonic acid.
Bromobenzanthrone	3-Bromo-7H-benz[de]anthracen-7-one.
C acid	3-Amino-1,5-naphthalenedisulfonic acid.
C.A. acid	3-Amino-6-chloro-4-sulfobenzolic acid.
C-Amine (Lake Red C acid)	2-Amino-5-chloro-p-toluenesulfonic acid.
Cassella acid	5-Hydroxy-1-naphthalenesulfonic acid.
Chicago Acid (SS acid)	4-Amino-5-hydroxy-1,3-naphthalenedisulfonic acid.
Chlorobenzanthrone	Chloro-7H-benz[de]anthracen-7-one.
Chromotropic acid	4,5-Dihydroxy-2,7-naphthalenedisulfonic acid.
Chrysazin	1,8-Dihydroxyanthraquinone.
1,6-Cleve's acid	5-Amino-2-naphthalenesulfonic acid.
1,7-Cleve's acid	8-Amino-2-naphthalenesulfonic acid.
Crocein acid	7-Hydroxy-1-naphthalenesulfonic acid.
2-Cyanopyridine	Picolinonitrile.
3-Cyanopyridine	Nicotinonitrile.
Cyanuric chloride	2,4,6-Trichloro-s-triazine.
D acid	6-Amino-1-naphthalenesulfonic acid.
DADI	Dianisidine diisocyanate.
DDB	p-Dibutoxybenzene.
Decacyclene	Diacenaphtho[1,2-]:1',2'-l]fluoranthene.
Dehydrothio-p-toluidine	2-(p-Aminophenyl)-6-methylbenzothiazole.
Developer Z	3-Methyl-1-phenyl-2-pyrazolin-5-one.
o-Dianisidine	3,3'-Dimethoxybenzidine.
1,1'-Dianthrilmide	1,1'-Iminodianthraquinone.
Dibenzanthrone	Violanthrone.
Dichione	2,3-Dichloro-1,4-naphthoquinone.
4,4'-Dihydrocydiphenylsulfone	4,4'-Sulfonyldiphenol.
Dimethyl POPO	1,4-Bis[2-(4-methyl-5-phenyloxazolyl)]benzene.
4,5-Dinitrochrysazin	1,8-Dihydroxy-4,5-dinitroanthraquinone.
Dioxy S acid	4,5-Dihydroxy-1-naphthalenesulfonic acid.
Diphenyl epsilon aci	6,8-Dianilino-1-naphthalenesulfonic acid.
Durene	1,2,4,5-Tetramethylbenzene.
Epsilon acid (Andresen's acid)	8-Hydroxy-1,6-naphthalenedisulfonic acid.
F acid	7-Hydroxy-2-naphthalenesulfonic acid.
Fast Red G base	2-Nitro-p-toluidine [$\text{NH}_2 = 1$].
Fast Scarlet R base	5-Nitro-o-anisidine [$\text{NH}_2 = 1$].
Fischer's aldehyd	1,3,3-Trimethyl- ω^2 , α -indolneacetaldehyde.
Fischer's base	1,3,3-Trimethyl-2-methyleneindoline.

APPENDIX B

Table B-1—Continued

Cyclic Intermediates: Glossary of synonymous names

<i>Common name</i>	<i>Standard (chemical abstracts) name</i>
Freund's acid	4-Amino-2,7-naphthalenedisulfonic acid.
G salt	7-Hydroxy-1,3-naphthalenesulfonic acid, sodium salt.
Gamma acid	6-Amino-4-hydroxy-2-naphthalenesulfonic acid, sodium salt.
Gold salt	9,10-Dihydro-9,10-dioxo-1-anthracenesulfonic acid and salt.
H acid	4-Amino-5-hydroxy-2,7-naphthalenedisulfonic acid, (8-Amino-1-naphthol-3,6-disulfonic acid).
Hellmellitene	1,2,3-Trimethylbenzene.
Indoxyl	3(2H)-Indolone.
Isodurene	1,2,3,5-Tetramethylbenzene.
J acid	7-Amino-4-hydroxy-2-naphthalenesulfonic acid, sodium salt.
J acid urea	7,7'-Ureylenebis[4-hydroxy-2-naphthalenesulfonic acid]
K acid	4-Amino-5-hydroxy-1,7-naphthalenedisulfonic acid.
Koch's acid	8-Amino-1,3,6-naphthalenetrilsulfonic acid.
L acid	5-Hydroxy-1-naphthalenesulfonic acid.
Lake Red C amine	2-Amino-5-chloro-p-toluenesulfonic acid.
Laurent's acid	5-Amino-1-naphthalenesulfonic acid.
M acid	8-Amino-4-hydroxy-2-naphthalenesulfonic acid.
MEP	5-Ethyl-2-picoline (2-Methyl-5-ethylpyridine).
Mesitylene	1,3,5-Trimethylbenzene.
Methane base	4,4'-Methylenebis[N,N-dimethylaniline].
Michler's hydrol	4,4'-Bis[dimethylamino]benzhydrol.
Michler's ketone	4,4'-Bis[dimethylamino]benzophenone.
MOCA	3,3'-Dichloro-4,4'-diaminodiphenylmethane.
MVP	5-Vinyl-2-picoline.
Naphthionic acid	4-Amino-1-naphthalenesulfonic acid.
o-Naphthionic acid	1-Amino-2-naphthalenesulfonic acid.
β-Naphthol	2-Naphthol, tech
Naphthol AS	3-Hydroxy-2-naphthanol.
α-Naphthylamine	1-Naphthylamine.
Neville & Winther's acid	4-Hydroxy-1-naphthalenesulfonic acid.
m-Nitrobenzoyl J acid	4-Hydroxy-7-(m-nitrobenzamido)-2-naphthalenesulfonic acid.
Oxy Koch's acid	1-Naphthol-3,6,8-trisulfonic acid.
Pentaanthrimide	1,4,5,8-Tetrakis(1-anthraquinonylamino)anthraquinone.
Peri acid	8-Amino-1-naphthalenesulfonic acid.
Phenylbiphenyl	Terphenyl.
N-Phenyldiethanolamine	2,2'-[(Phenyl)imino]diethanol.
Phenyl gamma acid	6-Anilino-4-hydroxy-2-naphthalenesulfonic acid.
Phenyl J acid	7-Anilino-4-hydroxy-2-naphthalenesulfonic acid.
Phenyl peri acid	8-Anilino-1-naphthalenesulfonic acid.
Picric acid	2,4,6-Trinitrophenol.
POPO	1,4-Bis[2-(5-phenyloxazolyl)]benzene.
Pseudocumene	1,2,4-Trimethylbenzene.
Pyrazoleanthrone	Anthra[1,9-cd]pyrazol-6(2H)-one.
Pyrazoleanthrone yellow	[3,3'-Bianthra[1,9-cd]pyrazole]-6,6'-(2H,2'H)dione.
Pyrazolone T	5-Oxo-1-(p-sulfophenyl)-2-pyrazoline-3-carboxylic acid.
Quinizarin	1,4-Dihydroxyanthraquinone.
2-Quinizarinsulfonic acid	9,10-Dihydro-1,4-dihydroxy-9,10-dioxo-2-anthracenesulfonic acid.
Quinoline yellow base	Quinophthalone.
R salt	3-Hydroxy-2,7-naphthalenedisulfonic acid, disodium salt.
RG acid (Violet acid)	4-Hydroxy-2,7-naphthalenedisulfonic acid.
Rhoduline acid (J Acid Imide)	7,7'-Iminobis[4-hydroxy-2-naphthalenesulfonic acid].
RR acid	3-Amino-5-hydroxy-2,7-naphthalenedisulfonic acid.
S acid	4-Amino-5-hydroxy-1-naphthalenesulfonic acid.
Schaffer's acid	6-Hydroxy-2-naphthalenesulfonic acid.
Silver salt	9,10-Dihydro-9,10-dioxo-2-anthracenesulfonic acid and salt.
Solvent Yellow 1	p-Phenylazoaniline and hydrochloride.

SYNTHETIC ORGANIC CHEMICALS, 1986

Table B-1—Continued

Cyclic Intermediates: Glossary of synonymous names

<i>Common name</i>	<i>Standard (chemical abstracts) name</i>
Solvent Yellow 3	4-(o-Tolylazo)-o-toluidine.
SS acid (Chicago acid)	4-Amino-5-hydroxy-1,3-naphthalenedisulfonic acid.
Sulfanilic acid	p-Aminobenzenesulfonic acid.
o-Sulfobenzaldehyde	o-Formylbenzenesulfonic acid.
Tetralin	1,2,3,4-Tetrahydronaphthalene.
Thiolindoxyl	3(2H)-Thianaphthenone.
Thiosalicylic	o-Mercaptobenzoic acid.
Tobias acid	2-Amino-1-naphthalenesulfonic acid.
TODI	Bitoluene diisocyanate.
o-Toldine	3,3'-Dimethylbenzidine.
α -Toluic acid	Phenylacetic acid.
α -Tolunitrile	Phenylacetonitrile.
4-m-Tolylendiamine	Toluene-2,4-diamine.
Trimellitic anhydride	1,2,4-Benzenetricarboxylic acid, 1,2-anhydride.
Trimethyl base	1,3,3-Trimethyl-2-methyleneindoline.
Trinitrophenol	Picric acid.
Urea J acid (J acid urea)	7,7'-Ureylenebis[4-hydroxy-2-naphthalenesulfonic acid].
Veratraldehyde	3,4-Dimethoxybenzaldehyde.
Veratrole	o-Dimethoxybenzene.
Vinyltoluene	ar-Methylstyrene.
Violet acid (RG acid)	4-Hydroxy-2,7-naphthalenedisulfonic acid.

APPENDIX C
SYNTHETIC ORGANIC CHEMICALS,
U.S. PRODUCTION AND SALES, 1986

SYNTHETIC ORGANIC CHEMICALS, 1986

SYNTHETIC ORGANIC CHEMICALS, U.S. PRODUCTION AND SALES, 1986

HARMONIZED SYSTEM BASIS

The following table contains 1986 U.S. production and sales data for synthetic organic chemicals in the proposed 6-digit Harmonized System (HS) format. The Commission decided to compile such data in this format in response to the decision by the U.S. Bureau of the Census to publish Standard Industrial Classification (SIC) data which will be convertible to the HS beginning with the 1987 *Census of Manufactures*. The U.S. Bureau of the Census has historically referred to the *Synthetic Organic Chemicals, United States Production and Sales* (SOC) report in the chemicals section of the *Census of Manufactures*, which permits them to omit collecting synthetic organic chemicals production and shipments data from its respondents. Because of this situation, the SOC data will now also be compiled on an HS basis to provide comparability with the new SIC format.

The table provides production and sales data on a 6-digit HS basis only where publication would not violate the statutory provisions relating to unlawful disclosure of information accepted in confidence by the Commission. It includes only the 6-digit item numbers with publishable data from a number of HS chapters in which these chemicals are classified, but does not provide totals by chapter or overall total figures.

APPENDIX C

Table C-1
Synthetic organic chemicals: U.S. production and sales, 1986, harmonized system basis

HS number	Description	Production		Sales
		Quantity	Quantity	Value
		Pounds	Pounds	Dollars
151800	Chemically modified fats and oils and their fractions (except those of heading 1516)	102,688,929	103,405,378	55,710,454
151919	Other industrial monocarboxylic fatty acids nspf	19,399,814	16,619,745	7,394,963
220720	Ethyl alcohol and other spirits, denatured, of any strength	529,436,478	697,756,579	182,403,571
271113	Butanes, liquefied	3,070,943,013	1,655,446,358	117,409,055
271114	Ethylene, propylene, butylene and butadiene, liquefied	3,748,460,537	1,602,202,15	163,745,019
271119	Other petroleum gases and other gaseous hydrocarbons nspf, liquefied	6,489,281,528	2,721,063,106	147,009,559
271129	Other petroleum gases and other gaseous hydrocarbons nspf, in gaseous state	8,551,715,361	6,605,439,023	431,277,977
290110	Acyclic hydrocarbons, saturated	2,394,500,067	1,075,699,306	140,303,858
290121	Ethylene	32,858,728,365	10,178,632,828	1,406,220,966
290122	Propene (Propylene)	16,522,226,828	7,661,048,145	838,453,543
290123	Butene (Butylene) and isomers thereof	1,124,288,563	257,202,809	56,149,589
290124	Buta-1,3-diene and isoprene	2,685,792,768	2,587,007,807	435,340,238
290129	Unsaturated acyclic hydrocarbons nspf	2,898,440,052	1,814,812,574	474,576,104
290211	Cyclohexane	2,070,482,904	1,694,488,442	255,473,417
290219	Other cyclanes, cyclenes and cycloterpenes nspf	357,369,470	164,990,068	69,641,218
290220	Benzene	9,966,472,478	.....	.....
290244	Mixed xylene isomers .....	.....	2,685,747,729	275,362,202
290250	Styrene	7,887,504,804	3,575,918,000	661,912,000
290260	Ethylbenzene	9,020,112,000	.....	.....
290270	Cumene	3,744,917,050	2,120,857,521	313,146,403
290290	Other cyclic hydrocarbons nsp	3,326,557,729	2,709,773,032	536,290,747
290311	Chloromethane (Methyl chloride) and chloroethane (Ethyl chloride)	768,160,120	.....	.....
290312	Dichloromethane (Methylene chloride)	566,406,000	519,168,610	89,042,918
290313	Chloroform (Trichloromethane)	422,415,000	416,420,680	82,117,726
290314	Carbon tetrachloride	626,972,000	495,866,470	68,871,686
290315	1,2-Dichloroethane (Ethylene dichloride)	12,940,257,804	787,882,144	65,784,043
290319	Other saturated chlorinated derivs of acyclic hydrocarbons nspf1	267,191,043	1,325,250,033	336,796,551
290321	Vinyl chloride (Chloroethylene)	8,439,083,208	3,409,208,707	456,850,544
290329	Other unsaturated chlorinated derivs of acyclic hydrocarbons nspf .....	.....	103,692,000	56,980,474
290330	Fluorinated, brominated or iodinated derivs of acyclic hydrocarbons	168,150,789	84,777,634	60,349,198
290340	Halogenated derivs of acyclic hydrocarbons containing two or more different halogens	1,082,091,704	921,626,331	693,902,622

SYNTHETIC ORGANIC CHEMICALS, 1986

Table C-1—Continued

Synthetic organic chemicals: U.S. production and sales, 1986, harmonized system basis

HS number	Description	Production		Sales
		Quantity		Quantity
		Pounds	Pounds	Value
				Dollars
290361	Chlorobenzene, o-dichlorobenzene and p-dichlorobenzene	346,042,992	197,735,872	71,435,621
290369	Other halogenated derivs of aromatic hydrocarbons nsp	179,454,338	106,852,024	124,257,832
290410	Hydrocarbon derivs containing only sulfo groups, their salts and ethyl esters	1,036,023,327	332,116,876	162,168,969
290420	Hydrocarbon derivs containing only nitro or only nitroso groups	2,037,206,768	460,378,508	123,706,580
290490	Other sulfonated, nitrated or nitrosated derivs of hydrocarbons nspf, whether or not halogenated	171,322,542	.....	.....
290511	Methanol (Methyl alcohol)	7,205,074,000	2,743,139,000	135,278,000
290512	Propan-1-ol (Propyl alcohol) and propan-2-ol (Isopropyl alcohol)	1,476,102,260	1,090,410,254	211,528,249
290513	Butan-1-ol (n-Butyl alcohol)	880,610,187	516,790,678	102,921,554
290514	Other butanols nspf	1,182,965,335	563,024,258	42,328,119
290519	Other saturated acyclic monohydric alcohols nspf .	629,738,629	248,966,520	100,259,939
290531	Ethylene glycol (Ethanediol)	4,770,876,072	3,003,203,514	534,754,827
290532	Propylene glycol (Propane-1,2-diol)	573,013,300	543,692,573	164,989,452
290539	Other acyclic diols nspf	2,459,358,914	1,692,068,094	929,906,768
290542	Pentaerythritol	119,517,161	116,415,000	57,361,000
290544	D-glucitol (Sorbitol)	185,826,704	133,620,987	48,361,636
290549	Other acyclic polyhydric alcohols nspf	900,004,964	874,271,395	52,353,780
290550	Halogenated, sulfonated, nitrated or nitrosated derivs of acyclic alcohols .....	.....	5,705,700	8,750,492
290629	Other aromatic cyclic alcohols and their halo, sulfo, nitro or nitroso derivs nspf	784,681	519,789	2,845,415
290711	Phenol (Hydroxybenzene) and its salts	3,114,550,000	1,544,158,000	292,376,000
290723	4,4'-Isopropylidenediphenol (Bisphenol A, Diphenylolpropane) and its salts	956,212,865	340,575,000	146,988,000
290810	Derivatives of phenols or phenol-alcohols containing only halogen substituents and their salts	79,610,759	52,081,405	40,673,829
290820	Derivatives of phenols or phenol-alcohols containing only sulfo groups, their salts and esters	5,386,278	2,870,947	2,256,478
290890	Other halo, sulfo, nitro or nitroso derivs of phenols or phenol-alcohols nsp	33,993,528	25,082,233	26,527,144
290919	Other acyclic ethers, and their halo, sulfo, nitro or nitroso derivs	3,209,588,946	2,464,796,986	444,884,388
290930	Aromatic ethers and their halo, sulfo, nitro or nitroso derivs	183,167,766	121,644,224	77,716,435
290941	2,2'-Oxydiethanol (Diethylene glycol, Digol)	489,590,399	362,117,506	53,086,020
290942	Monomethyl ethers of ethylene glycol or of diethylene glycol	118,922,888	115,144,830	34,124,918
290943	Monobutyl ethers of ethylene glycol or of diethylene glycol	393,811,269	366,559,233	105,280,603
290949	Other ether-alcohols and their halo, sulfo, nitro or nitroso derivs nspf	572,875,239	404,841,345	211,507,826

APPENDIX C

Table C-1—Continued

Synthetic organic chemicals: U.S. production and sales, 1986, harmonized system basis

HS number	Description	Production		Sales
		Quantity	Quantity	Value
		Pounds	Pounds	Dollars
290950	Ether-phenols, ether-alcohol-phenols and their halo, sulfo, nitro or nitroso derive	372,858,341	354,927,848	149,413,843
290960	Alcohol-, ether- and ketone peroxides and their halo, sulfo, nitro or nitroso derive	105,054,483	24,283,401	41,168,172
291010	Oxirane (Ethylene oxide)	5,429,645,420	567,963,084	116,524,261
291090	Other epoxides, epoxyalcohols, epoxyphenols and epoxyethers, with 3-membered ring, and halo, sulfo, nitro or nitroso derive	25,671,203	10,761,084	22,213,546
291211	Methanal (Formaldehyde)	5,549,417,197	1,887,016,155	112,795,119
291213	Butanal (Butyraldehyde, normal isomer)	1,470,654,620	.....	.....
291219	Other acyclic aldehydes without other oxygen function nspf	770,884,267	101,087,490	55,953,470
291229	Other cyclic aldehydes without other oxygen function nspf	8,582,097	.....	.....
291230	Aldehyde-alcohols .....	.....	1,814,874	8,449,444
291412	Butanone (Methyl ethyl ketone)	600,440,200	606,808,177	128,641,123
291413	4-Methylpentan-2-one (Methyl isobutyl ketone) ..	156,022,419	159,249,649	55,393,201
291422	Cyclohexanone and methylcyclohexanones	890,141,447	71,936,234	27,285,216
291423	Ionones and methylionones	1,417,075	948,183	7,152,441
291430	Aromatic ketones without other oxygen function ..	4,834,136	3,165,277	11,936,980
291441	4-Hydroxy-4-methylpentan-2-one (Diacetone alcohol) .....	.....	22,559,068	10,325,441
291521	Acetic acid	2,728,301,000	864,960,000	103,424,000
291522	Sodium acetate	40,840,297	.....	.....
291529	Acetic acid salts nsp	6,698,350	6,891,874	7,399,043
291531	Ethyl acetate	198,051,000	174,691,000	37,506,000
291532	Vinyl acetate	1,710,310,000	1,188,113,554	245,380,488
291533	n-Butyl acetate	179,154,726	149,315,041	44,502,864
291534	Isobutyl acetate	75,753,793	59,221,296	14,913,104
291535	2-Ethoxyethyl acetate (Ethylene glycol, monoethyl ether acetate)	84,081,536	79,879,809	31,889,692
291539	Other esters of acetic acid nspf	194,108,699	175,271,230	109,723,701
291540	Mono-, di- or trichloroacetic acids, their salts and esters	4,111,179	.....	.....
291550	Propionic acid, its salts and esters	259,734,248	113,547,690	48,933,961
291570	Palmitic acid, stearic acid, their salts and esters .	191,393,351	169,027,170	113,809,264
291590	Other saturated acyc monocarboxylic acids, their anhydrides, halides, peroxides, peroxyacids; halo, sulfo, nitro, nitroso derive nsp	470,639,875	261,666,902	172,657,867
291611	Acrylic acid and its salts	970,018,900	168,934,058	66,140,399
291615	Oleic, linoleic or linolenic acids, their salts and esters	92,873,185	84,694,503	41,531,664

SYNTHETIC ORGANIC CHEMICALS, 1986

Table C-1—Continued
Synthetic organic chemicals: U.S. production and sales, 1986, harmonized system basis

HS number	Description	Production		Sales
		Quantity		Quantity
		Pounds	Pounds	Value Dollars
291619	Other unsaturated acyc monocarboxylic acids, their anhydrides, halides, peroxides, peroxyacids nspf; halo, sulfo, nitro, nitroso deriv	42,761,658	44,643,581	60,706,411
291620	Cyclanic, cyclenic or cycloterpenic monocarboxylic acids, their anhydrides, halides, peroxides, peroxyacids and their derivs	41,613,137	33,399,567	85,624,253
291639	Other aromatic monocarboxylic acids, their anhydrides, halides, peroxides, peroxyacids and their derivs nsp	24,385,448	18,750,877	65,423,460
291719	Other acyc. polycarboxylic acids, their anhydrides, halides, peroxides, peroxyacids nspf; halo, sulfo, nitro or nitroso derivs	538,026,553	430,281,919	250,253,033
291731	Dibutyl orthophthalates	23,887,833	20,593,901	8,882,206
291732	Diocetyl orthophthalates	295,715,500	299,759,156	93,559,101
291735	Phthalic anhydride	863,122,551	547,993,805	124,794,060
291739	Other aromatic polycarboxylic acids, their anhydrides, halides, peroxides, peroxyacids nspf and their derivs	3,370,397,272	944,931,407	389,586,654
291819	Other carbox. acids w/ add alcohol function only, anhydrides, halides, peroxides, peroxyacids nspf; halo, sulfo, nitro, nitroso derivs	32,927,264	18,212,456	22,917,345
291822	O-Acetylsalicylic acid (Aspirin), its salts and esters	30,535,164	.....	.....
291829	Other carboxylic acids w/ add phenol funct only, anhydrides, halides, peroxides, peroxyacids nspf; halo, sulfo, nitro, nitroso derivs	3,943,086	3,726,108	11,124,106
291830	Other carboxylic acids with add aldehyde or ketone function only, anhydrides, halides, peroxides, peroxyacids nspf; halo, etc. derivs ..	970,959,676	32,320,097	20,382,734
291890	Other carboxylic acids w/ add oxygen function, anhydrides, halides, peroxides, peroxyacids nspf; halo sulfo, nitro, nitroso derivs	95,310,665	84,987,582	252,570,391
291900	Phosphoric esters and their salts, incl. lactophosphates; their halo, sulfo, nitro, nitroso derivs	200,431,580	150,425,482	161,960,854
292010	Thiophosphoric esters (phosphorothioates), their salts; their halo, sulfo, nitro, nitroso derivs	98,514,650	85,981,824	178,185,083
292090	Other esters of inorg. acids (excl. esters of hydrogen halides) nspf, their salts; halo, sulfo, nitro, nitroso derivs	227,257,363	161,746,079	139,265,151
292111	Methylamine, di- or trimethylamine, and their salts	111,957,000	.....	.....
292112	Diethylamine and its salts .....	.....	5,377,045	4,089,756
292119	Other acyclic monoamines and their derivs nspf; salts thereof	260,140,269	242,754,578	164,060,626
292129	Other acyclic polyamines and their derivs nspf; salts thereof.	115,946,808	92,639,357	101,213,121
292130	Cyclanic, cyclenic, cycloterpenic mono- or polyamines and their derivs; salts thereof	23,006,283	20,974,269	38,312,880
292141	Aniline and its salts	823,892,000	412,898,994	100,105,165

APPENDIX C

Table C-1—Continued

Synthetic organic chemicals: U.S. production and sales, 1986, harmonized system basis

HS number	Description	Production		Sales
		Quantity		Quantity
		Pounds	Pounds	Value Dollars
292211	Monoethanolamine and its salts	209,321,238	155,361,845	40,559,754
292212	Diethanolamine and its salts	179,432,833	162,415,842	42,943,669
292213	Triethanolamine and its salts	177,808,534	175,116,966	55,273,646
292219	Other amino-alcohols nspf, their ethers and esters, containing only one kind of oxygen function; salts thereof	115,613,442	89,589,977	99,313,352
292229	Other amino-naphthols and amino-phenols nspf, their ethers, esters, containing only one kind of oxygen function; salts thereof	3,616,804	.....	.....
292230	Amino-aldehydes, amino-ketones and amino-quinones, containing only one kind of oxygen function; salts thereof	231,540	.....	.....
292249	Other amino-acids nspf and their esters, containing only one kind of oxygen function; salts thereof	97,826,022	69,065,626	140,696,263
292250	Amino-alcohol-phenols, amino-acid-phenols and other amino-compounds with oxygen function ...	62,420,475	12,079,686	56,824,794
292390	Other quaternary ammonium salts and hydroxides nspf	42,321,866	37,600,864	50,409,922
292410	Acyclic amides (including acyclic carbamates), and their derivs; salts thereof	299,000,041	145,395,578	154,700,852
292421	Ureines and their derivs; salts thereo	27,144,157	20,367,944	65,387,421
292429	Other cyclic amides nspf (including cyclic carbamates) and their derivs; salts thereof	157,106,969	144,226,576	431,270,001
292519	Other imides nspf and their derivs; salts thereof ..	14,380,076	9,666,684	20,298,868
292520	Imines and their derivs; salts thereof	257,301,380	178,378,353	90,040,959
292690	Other nitrile-function compounds nspf	4,364,826,482	1,550,248,855	564,621,122
292700	Diazo-, azo-, or azoxy-compounds	16,082,584	14,506,818	46,642,694
292800	Organic derivs of hydrazine or of hydroxylamine ..	3,218,642	3,793,635	11,454,757
292910	Isocyanates	1,477,647,000	1,359,240,175	1,067,491,128
292990	Other compounds nspf with other nitrogen functions	50,112,378	25,027,504	21,903,905
293020	Thiocarbamates and dithiocarbamates	37,827,038	32,680,087	66,239,042
293090	Other organo-sulfur compounds nspf	328,017,306	220,051,945	406,467,273
293100	Other organo-inorganic compounds	502,090,024	153,886,156	854,452,767
293211	Tetrahydrofuran	121,957,616	47,957,671	43,004,158
293229	Other lactones nspf with oxygen hetero-atom(s) only	128,232,015	23,210,624	71,357,976
293339	Other heterocyclic cmpds with nitrogen hetero-atom(s) only nspf, with unfused pyridine ring (hydrogenated or not) in structure	89,263,009	54,495,750	393,779,794
293359	Heterocyc cmpds w/ nitrogen hetero-atom(s) only, pyrimidine (hydrogenated or not) or piperazine ring in struct; nucleic acids, salts	38,537,353	23,296,051	140,543,587
293369	Other heterocyc cmpds w/ nitrogen hetero-atom(s) only nspf, with unfused triazine ring (hydrogenated or not) in the structure	430,027,673	328,079,890	737,254,034

SYNTHETIC ORGANIC CHEMICALS, 1986

Table C-1—Continued

Synthetic organic chemicals: U.S. production and sales, 1986, harmonized system basis

HS number	Description	Production		Sales	
		Quantity		Value	
		Pounds	Pounds	Pounds	Dollars
293371	6-Hexanelactam (epsilon-Caprolactam)	1,108,898,800	.....	.....	.....
293390	Other heterocyclic compounds with nitrogen hetero atom(s) only nspf	175,478,333	102,397,728	196,875,811	
293420	Heterocyclic compounds containing a benzothiazole ring-system (hydrogenated or not), not further fused	65,580,376	46,384,628	113,481,396	
293490	Other heterocyclic compounds nspf	55,258,009	44,447,643	188,274,099	
293628	Vitamin E (Tocopherols and related cmpds with Vitamin E activity) and its derivs, unmixed	18,609,000	10,773,000	110,943,000	
294110	Penicillins and their derivs with a penicillanic acid structure; salts thereof	7,719,009	1,522,298	39,832,664	
294190	Other antibiotics nspf	3,485,343	2,158,972	302,900,939	
294200	Organic compounds nspf	819,349,065	379,640,272	177,019,897	
310210	Urea, whether or not in aqueous solution	9,500,307,000	.....	.....
320411	Disperse dyes and preparations based thereon ...	26,120,915	21,835,890	86,266,951	
320412	Acid dyes, premetallized or not, mordant dyes and preparations based thereon	21,538,000	19,822,000	85,500,000	
320413	Basic dyes and preparations based thereon	12,401,758	11,813,852	57,447,363	
320414	Direct dyes and preparations based thereon	39,816,173	34,255,226	82,191,684	
320415	Vat dyes (including those usable in that state as pigments) and preparations based thereon ..	39,146,507	40,889,779	76,226,024	
320417	Pigments and preparations based thereon	93,929,524	82,304,950	523,505,542	
320419	Other synth. organic coloring matter nspf and preparations based thereon, incl mixtures of items of subheadings 3204.11 thru 3204.19	35,476,059	31,055,274	126,255,288	
320420	Fluorescent brightening agents	50,132,423	55,333,000	63,145,000	
380610	Rosin	176,324,728	161,850,597	54,257,072	
380630	Ester gums	241,299,344	157,707,875	104,621,723	
380991	Other finishing agents, dye carriers, like products nspf, for textile industry use	52,677,913	50,919,524	24,759,985	
380999	Other finishing agents, dye carriers, like products nspf, for leather industry use	25,983,165	26,166,137	16,040,179	
381121	Lubricating oil additives containing petroleum oils or oils obtained from bituminous minerals	1,612,138,350	1,076,993,807	806,163,552	
381210	Prepared rubber accelerators .....	.....	2,647,632	6,786,638	
381230	Antioxidizing preps and compound stabilizers for rubber or plastics	93,906,025	70,680,627	47,862,837	
381590	Reaction initiators, reaction accelerators, and catalytic preps, nspf	86,475,614	12,778,168	29,603,006	
382320	Naphthenic acids, their water-insoluble salts and their esters	87,529,850	21,876,546	20,887,504	
382390	Other chemical products, preparations, and residual products of the chemical or allied industries nspf	10,364,176,170	4,665,984,509	821,155,721	
390110	Polyethylene having a specific gravity of less than 0.94	8,875,701,923	8,001,165,679	2,545,759,885	

APPENDIX C

Table C-1—Continued

Synthetic organic chemicals: U.S. production and sales, 1986, harmonized system basis

HS number	Description	Production		Sales
		Quantity	Quantity	Value
		Pounds	Pounds	Dollars
390120	Polyethylene having a specific gravity of 0.94 or more	7,107,297,963	6,762,459,090	1,863,727,817
390210	Polypropylene	6,256,482,792	4,874,046,996	1,578,384,722
390311	Polystyrene, expandable .....	.....	427,752,892	234,078,615
390319	Polystyrene, other than expandable	4,116,327,334	3,299,113,277	1,094,338,822
390320	Styrene-acrylonitrile (SAN) copolymers	319,782,386	148,358,888	86,121,244
390330	Acrylonitrile-butadiene-styrene (ABS) copolymers .	1,138,608,234	1,095,091,036	814,213,361
390390	Other polymers of styrene nspf, in primary forms .	1,112,980,097	1,090,655,247	705,760,174
390461	Polytetrafluoroethylene (PTFE)	26,607,375	21,921,715	123,634,708
390511	Polymers of vinyl acetate in aqueous dispersion ...	691,515,548	556,907,712	296,132,891
390520	Polyvinyl alcohols, whether or not containing unhydrolyzed acetate groups	171,450,662	.....	.....
390590	Polymers of vinyl esters nspf, in primary forms; other vinyl polymers nspf, in primary forms	636,671,731	535,777,801	413,846,352
390610	Polymethyl methacrylate	475,429,231	330,204,163	345,318,862
390690	Other acrylic polymers nspf in primary forms	1,802,774,188	1,347,486,332	1,343,440,546
390730	Epoxide resins	709,648,024	496,302,586	584,295,837
390750	Alkyd resins	722,172,277	472,576,805	301,634,279
390760	Polyethylene terephthalate	3,837,299,469	2,239,784,231	4,040,145,472
390791	Other polyesters nspf, unsaturated, in primary forms	1,343,543,596	1,213,407,839	741,859,648
390799	Other polyesters nspf, saturated, in primary forms	400,386,520	306,566,832	296,995,785
390810	Polyamide-6, -11, -12, -6,6, -6,9, -6,10 or -6,12 (nylon type)	2,883,152,165	.....	.....
390890	Other polyamides nspf in primary forms	407,875,550	350,893,709	550,024,497
390920	Melamine resins	215,398,717	187,474,106	162,061,861
390940	Phenolic resins	1,824,806,256	1,319,237,818	673,985,394
390950	Polyurethanes	278,988,798	181,483,424	307,069,461
391290	Cellulose and its chemical derivatives nspf, in primary forms	854,393,897	164,867,698	132,315,001
400299	Other synthetic rubber nspf	780,621,733	314,677,484	302,439,306

APPENDIX D
ALPHABETICAL CHEMICAL INDEX

SYNTHETIC ORGANIC CHEMICALS, 1986

ALPHABETICAL CHEMICAL INDEX

The alphabetical index of chemicals contained in this appendix table is an outgrowth of the processing of data by the U.S. International Trade Commission for its annual report, *Synthetic Organic Chemicals, United States Production and Sales*. This index will aid those who have an interest in the report, either as users of the published data or as suppliers of individual company data to the Commission, principally by showing the section number and line item number of specific chemicals. This information can be used to assist in locating a chemical in the report and to provide respondents to the Commission's questionnaire with information on where to list their production and sales data. The index shows only those chemicals for which production or sales were reported to the Commission for this edition of the report.

The index, initially designed for Commission use in computer processing of data for the annual report, has certain characteristics that should be noted to increase its usefulness. For example, superior headings for individual entries are not shown in the index. Thus, understanding the contents of the first item in the index, "accelerators, activators, and vulcanizing agents, acyclic, *other*," necessitates that the index user turn to the individual section (in the report) and item number (in the questionnaire) to find those acyclic accelerators, activators, and vulcanizing agents already specified. Similarly, the index entry "specific gravity 0.940 and below" does not by itself identify the chemical product. The index user will need to turn to the indicated section number and item number to determine the chemical referred to--in this case, polyethylene.

The chemical names used in this report and in the questionnaires sent to U.S. producers to obtain the data aggregated in the report are listed alphabetically in the first column of each listing in the index. The second column refers to the section in the report and questionnaire containing the chemical, and the third column shows the appropriate item number in that section in the questionnaire.

Table 4
Alphabetical chemical index

<i>Chemical name</i>	<i>Sect. No.</i>	<i>Item No.</i>
Accelerators, activators, and vulcanizing agents, cyclic, other	09	49.000
Acetaldehyde	15	782.000
Acetaldehyde, diphenethyl acetal (Phenylethyl acetal)	07	1.200
Acetaldehyde ethyl phenethyl acetal	07	1.300
Acetaldehyde phenethyl propyl acetal	07	1.400
Acetal resins	08	19.000
Acetamide	15	227.000
Acetamidoethanol (N-Acetyl-ethanolamine)	15	220.000
3-Acetamido-N-(2-succinimidoethyl)-N-ethylaniline	03	6.275
Acetaminophen	06	392.000
Acetanilide, tech.	03	7.000
Acetazolamide	06	736.000
Acetic acid, amides with polyalkylene polyamines, salt	12	357.900
Acetic acid, phenyl ester	03	8.000
Acetic acid, recovered (100%)	15	485.000
Acetic acid, synthetic (100%)	15	486.000
Acetic anhydride from acetaldehyde (100%)	15	487.000
Acetic anhydride from acetic acid, other than recovered, by the vapor-phase process (100%)	15	488.000
Acetic anhydride from acetic acid, recovered, by vapor-phase process	15	489.000
Acetoacetanilide	03	9.000
o-Acetoacetanilide	03	10.000
Acetoacetarylides yellows, all others	05	7.000
o-Acetoacetotoluidide	03	11.000
p-Acetoacetotoluidide	03	11.050
2',4'-Acetoacetoxylidide	03	11.500
Acetoacet-m-xylidide	03	11.513
Acetohexamide	06	686.000
1'-Acetonaphthone	03	12.000
2'-Acetonaphthone (β -Methyl naphthyl ketone)	07	1.500
Acetone, crude	15	809.000
Acetone from cumene	15	806.000
Acetone-formaldehyde resins	08	1.000
Acetone from isopropyl alcohol	15	807.000
Acetone sodium bisulfite	15	1281.500
Acetonitrile	15	432.000
3-(α -Acetonylbenzyl)-4-hydroxycoumarin (Warfarin)	13	169.000
Acetophenazine maleate	06	483.000
Acetophenone, tech.	03	14.000
p-Acetotoluidide	03	15.000
1-Acetoxy-2-sec-butyl-1-ethenylcyclohexane	07	93.500
6-Acetoxy-2,4-dimethyl-1,3-dioxane	15	1.000
4-Acetoxyethyl-4-nonene	07	126.050
Acetylacetone peroxide	15	1281.990

<i>Chemical name</i>	<i>Sect. No.</i>	<i>Item No.</i>
N-[(Acetylamino)methyl]-2-chloro-N-(2,6-diethylphenyl) acetamide	13	168.995
Acetyl-n-butyl (2,3-Hexanedione)	07	126.100
Acetyl cedrene (Vertoflex)	07	93.550
Acetyl chloride	15	490.500
Acetylene (For chemical use only)	02	38.000
Acetyl isovaleryl (5-Methyl-2,3-hexanedione)	07	126.500
N-Acetyl methyl anthranilate	07	93.555
Acetyl peroxide	15	1282.000
Acetyl propionyl (2,3-Pentanedione)	07	126.600
2-Acetylpyridine	03	19.450
Acid Black 1	04	203.000
Acid Black 52	04	211.000
Acid Black 60	04	214.000
Acid Black 63	04	214.063
Acid Black 92	04	215.000
Acid Black 107	04	216.000
Acid Black 172	04	218.172
Acid Black 194	04	218.194
Acid black dyes, all other	04	219.000
Acid Blue 9	04	132.000
Acid Blue 15	04	133.000
Acid Blue 25	04	136.000
Acid Blue 27	04	137.000
Acid Blue 29	04	138.000
Acid Blue 40	04	140.000
Acid Blue 41	04	141.000
Acid Blue 45	04	143.000
Acid Blue 67	04	145.067
Acid Blue 80	04	149.000
Acid Blue 92	04	153.000
Acid Blue 104	04	156.000
Acid Blue 113	04	157.000
Acid Blue 118	04	158.000
Acid Blue 145	04	161.000
Acid Blue 158, 158:1, and 158:2	04	162.000
Acid Blue 231	04	168.000
Acid Blue 277	04	168.277
Acid Blue 283	04	168.283
Acid Blue 298	04	168.298
Acid Blue 321	04	168.321
Acid Blue 324	04	168.324
Acid Blue 330	04	168.330
Acid blue dyes, all other	04	169.000
Acid Brown 14	04	189.000
Acid Brown 19	04	190.000
Acid Brown 24	04	191.024

Table 4—Continued
Alphabetical chemical index

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Chemical name	Sect. Item	
	No.	No.
Acid Brown 50	04	194.050
Acid Brown 97	04	196.000
Acid Brown 98	04	197.000
Acid Brown 147	04	197.147
Acid Brown 159	04	199.159
Acid Brown 160	04	199.160
Acid Brown 161	04	199.161
Acid Brown 165	04	199.165
Acid Brown 227	04	200.227
Acid Brown 239	04	200.239
Acid Brown 264	04	200.264
Acid brown dyes, all other	04	202.000
(Acid Green 3)	05	230.003
Acid Green 1	04	170.000
Acid Green 3	04	171.000
Acid Green 5	04	172.000
Acid Green 9	04	173.000
Acid Green 20	04	177.000
Acid Green 25	04	179.000
Acid Green 70	04	184.000
Acid Orange 7	04	43.000
Acid Orange 8	04	44.000
Acid Orange 10	04	45.000
Acid Orange 24	04	47.000
Acid Orange 60	04	54.000
Acid Orange 64	04	57.000
Acid Orange 86	04	61.000
Acid Orange 89	04	61.089
Acid Orange 116	04	62.000
Acid Orange 128	04	64.000
Acid Orange 152	04	65.152
Acid Orange 156	04	65.156
Acid Orange 161	04	65.161
Acid orange dyes, all other	04	66.000
(Acid Red 26)	05	214.000
Acid Red 1	04	67.000
Acid Red 4	04	68.000
Acid Red 14	04	69.000
Acid Red 18	04	71.000
Acid Red 27	04	73.000
Acid Red 57	04	79.000
Acid Red 73	04	81.000
Acid Red 85	04	83.000
Acid Red 87	04	84.000
Acid Red 88	04	85.000
Acid Red 97	04	87.000
Acid Red 114	04	92.000

Chemical name	Sect. Item	
	No.	No.
Acid Red 119	04	94.000
Acid Red 137	04	97.000
Acid Red 151	04	99.000
Acid Red 167	04	100.000
Acid Red 174	04	100.174
Acid Red 182	04	103.000
Acid Red 186	04	105.000
Acid Red 194	04	107.000
Acid Red 213	04	110.000
Acid Red 226	04	110.226
Acid Red 257	04	110.257
Acid Red 266	04	111.000
Acid Red 296	04	111.296
Acid Red 299	04	112.000
Acid Red 337	04	114.000
Acid Red 364	04	115.364
Acid Red 384	04	115.384
Acid Red 396	04	115.396
Acid red dyes, all other	04	116.000
Acids, acid anhydrides, and acyl halides, all other	15	586.000
Acid Violet 3	04	118.000
Acid Violet 7	04	119.000
Acid Violet 12	04	120.000
Acid Violet 17	04	121.000
Acid Violet 49	04	126.000
(Acid Yellow 1)	05	204.001
(Acid Yellow 23)	05	204.023
Acid Yellow 3	04	3.000
Acid Yellow 17	04	6.000
Acid Yellow 23	04	8.000
Acid Yellow 34	04	11.000
Acid Yellow 36	04	12.000
Acid Yellow 40	04	14.000
Acid Yellow 49	04	17.000
Acid Yellow 54	04	18.000
Acid Yellow 59	04	19.000
Acid Yellow 65	04	21.000
Acid Yellow 73	04	22.000
Acid Yellow 87	04	24.087
Acid Yellow 99	04	25.000
Acid Yellow 119	04	26.119
Acid Yellow 127	04	29.000
Acid Yellow 129	04	31.000
Acid Yellow 135	04	32.000
Acid Yellow 151	04	33.000
Acid Yellow 159	04	34.000
Acid Yellow 198	04	37.000

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 4—Continued
Alphabetical chemical index

Chemical name	Sect. Item	
	No.	No.
Acid Yellow 216	04	37.216
Acid Yellow 219	04	37.219
Acid Yellow 226	04	24.096
Acid Yellow 239	04	37.239
Acid yellow dyes, all other	04	38.000
Acrolein (Acrylaldehyde)	15	783.000
Acrylamide-2-acrylamido-2-methylpropanesulfonic acid, sodium salt polymer	14	395.000
Acrylamide-acrylic acid copolymer	14	396.000
Acrylamide-acrylic acid copolymer, sodium salt	14	397.000
Acrylamide N-dimethylaminomethylacrylamide copolymer	14	399.000
Acrylamide monomer	15	228.000
Acrylamide polymer with N,N-Diethyl-N-methyl-2[(1-oxo-2-propenyloxy)]ethaniminium sulfate	15	228.100
Acrylate-alkyd copolymer resins	08	1.900
Acrylic acid	15	491.000
Acrylic monomers, mixed	15	884.000
Acrylonitrile-butadiene-styrene (ABS) terpolymer resins	08	42.000
Acrylonitrile, monomer	15	433.000
Acyclic amphoteric surface-active agents, all other	12	19.000
Acyclic herbicides	13	212.000
Acyclic insecticides, all other	13	231.000
Acyclic plasticizers, all other	11	130.000
Acyclovir	06	186.800
Acyclic elastomers, all other	10	21.000
Adipic acid	15	492.000
Adipic acid, ammonium salt	15	613.000
Adipic acid-crosslinked polycrylamide	14	405.000
Adipic acid-diethylene triamine condensate	15	269.810
Adipic acid-diethylenetriamine-epichlorohydrin polymer	14	153.000
Adipic acid esters, all others	11	66.000
Adipic acid, sodium salt	15	613.400
Adipic acid type complex linear polyesters and polymeric plasticizers	11	131.100
Adipic dihydrazide	15	613.300
Adiponitrile	15	434.000
Aklomide	06	163.000
β -Alanine-N-(2-hydroxyethyl)-N-[2(1-oxococoyl)amino]ethyl, sodium salt	12	507.800
Albumin	06	574.800
C-20 alcohol and hydrocarbons, ethoxylated	12	742.350
C ₁₂ -C ₁₈ Alcohol lactates	15	1432.000
Alcohol mixtures, other	15	883.400
Alcohol mixtures, C11 or lower only	15	883.100
Alcohol mixtures, C19 and C20 only	15	883.300
Alcohol mixtures, C12 through C18 only	15	883.200

Chemical name	Sect. Item	
	No.	No.
Alcohols, monohydric, and their esters, C ₆ and higher, mixed	15	1425.200
Alcohols and phenols, alkoxylated and phosphated or polyphosphated, all other	12	91.000
Alcohols, unmixed C ₁₁ or lower, all other	15	870.000
Aldadiene	03	21.400
Aldehyde-amine reaction products, cyclic, other	09	8.000
Aldehydes, acyclic, all other	15	805.000
Alfentanil hydrochloride	06	392.500
Aliphatic hydrocarbon sulfides	14	253.000
Alkanolamine condensates, all other	12	575.000
Alkene thiophosphonate	14	265.000
Alkenyl succinimide	14	245.000
3-Alkoxy-2-hydroxypropyl trimethyl ammonium chloride	13	245.021
Alkoxy triacryl titanate	12	51.500
Alkoyl phenol	08	1.905
Alkyd copolymers, all other	08	3.900
Alkylalcohol ethoxylated and carbonated, sodium salt	12	318.600
2-(C ₁₅ -17 Alkyl)-1-(C ₁₄ -18 amidoethyl) (4,5-dimydro-3-methyl)imidazolium, methyl sulfate	12	455.950
N-alkylamine bismethylenephosphonic acid	14	27.000
Alkyl C ₁₂ -C ₁₄ amine hydrochloride	15	307.950
N-alkylaminobismethylene phosphonic acid salts	14	28.000
Alkyl aromatics: all other	02	4.000
Alkylaryl-p-phenylenediamines	09	55.100
Alkylaryl phosphites mixed	09	84.800
Alkylbenzene all other (except dodecyl, tridecyl and straight-chain)	03	23.000
Alkylbenzene straight-chain (except dodecyl and tridecyl)	03	22.000
Alkyl benzyl phthalates	11	16.500
Alkyl betaine	12	14.900
Alkyl dimethyl amine oxide	12	423.200
Alkyl glycidyl ethers, C ₁₂ -C ₁₄	15	1317.320
Alkyl glycidyl ethers, C ₈ -C ₁₀	15	1317.300
3-(C ₁₂ -18 alkyloxy)-1-propanamine	12	321.045
3-(C ₁₂ -18 alkyloxy)-1-propanamine	12	321.050
C ₁₂ -18 Alkyloxypropylamine, ethoxylated	12	321.060
N-(C ₁₂ -18 alkyl)oxypropyl trimethylene diamine	12	321.065
Alkylphenol formaldehyde condensate, alkoxylated	15	3.450
Alkylphenol-formaldehyde condensates, alkoxylated, all other	12	726.000
Alkylphenol formaldehyde copolymer	15	3.510
Alkyl phenols	14	219.000
Alkylphenols, mixed	03	23.100
Alkylpiperidines, mixed	12	111.600
Alkylpyridines, mixed	03	23.350

APPENDIX D

Table 4—Continued
Alphabetical chemical index

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Chemical name	Sect. Item	
	No.	No.
Alkyl succinic anhydride	14	268.000
Alkyl terephthalamate	14	269.000
All other acyclic flavor and perfume materials	07	172.000
All other benzenoid or naphthalenoid chemicals	07	93.000
All other dyes	04	1215.000
Allo-ocimene	07	126.800
Allopurinol	06	829.000
All other products from petroleum and natural gas, cyclic	02	36.000
All other terpenoid, heterocyclic, or alicyclic flavor and perfume chemicals	07	126.000
Allyl alcohol	15	840.000
Allylamines	15	258.000
p-Allylanisole	07	2.600
Allyl n-butyl trithiocarbonate	14	134.000
Allyl cyclohexyl propionate	07	93.560
4-Allyl-1,2-dimethoxybenzene (4-Allylveratrole)	07	4.000
Allyl disulfide	07	126.900
Allyl glycidyl ether	15	1298.600
Allyl heptanoate	07	126.990
Allyl hexanoate	07	127.000
Allyl methacrylate	15	885.000
4-Allyl-2-methoxyphenol (Eugenol)	07	5.000
4-Allyl-2-methoxyphenol acetate (Eugenol acetate)	07	5.100
Allyl resins	08	4.000
Allyl sulfonate, sodium salt	12	209.500
Allylsulfonic acid, sodium salt	15	614.000
alpha-Mexyl-gamma-butyrolactone	07	96.250
Alpha olefins, C ₈ -C ₁₀	02	60.100
Alpha olefins, C ₁₁ and higher	02	62.100
Alprazolam	06	466.500
Alprostadiol	06	679.100
Aluminum acetate	15	587.000
Aluminum acetylacetonate complex	15	1355.200
Aluminum chlorohydroxyphthalocyanine blue	03	23.400
Aluminum di-sec-butoxide acetoacetic ester chelate	15	1355.560
Aluminum diisopropoxide acetoacetic ester chelate	15	1355.580
Aluminum distearate	15	746.000
Aluminum 2-ethylhexanoate	15	629.000
Aluminum ethyl-3-oxobutanoate-0 ¹ ,0 ² -dihydroxy T-4	15	1355.600
Aluminum isopropoxide	15	1355.650
Aluminum monostearate	15	747.000
Aluminum octanoate	15	713.000
Aluminum phenolsulfonate	06	552.000
Aluminum stearate	15	748.100
Aluminum tri-sec-butoxide	15	1355.750
Aluminum tristearate	15	748.000

Chemical name	Sect. Item	
	No.	No.
Amides, all other	15	257.000
Amido amine salts as curing agents	15	228.300
Amiloride hydrochloride	06	736.500
Amine oxides and oxygen-containing amines (Except those with amide linkages), acyclic, all other	12	341.000
Amine oxides and oxygen-containing amines (Except those having amine linkages), cyclic, all other	12	357.000
Amines, all other	15	307.000
Amine salts (Not containing oxygen), all other	12	403.000
Amine salts of fatty, rosin, and tall oil acids, all other	12	35.000
3'-Aminoacetanilide	03	26.000
4'-Aminoacetanilide (Acetyl-p-phenylenediamine)	03	27.000
3'-Amino-p-acetanilide	03	27.100
Amino acids and salts, acyclic, all other	14	22.000
Amino acids and salts, cyclic, all other	14	23.000
2-(p-Aminoanilino)-5-nitrobenzenesulfonic acid	03	34.000
1-Aminoanthraquinone and salt	03	37.000
6-Amino-3,4'-azodibenzenesulfonic acid (C.I. Acid Yellow 9)	03	44.000
p-Aminobenzamide	03	45.100
3'-Aminobenzanilide	03	50.500
o-Aminobenzenethiol	03	53.000
Aminobenzolic acid	06	393.000
p-Aminobenzolic acid, tech.	03	56.000
2-Amino-6-benzothiazolesulfonic acid	03	58.090
1-Amino-4-bromo-9,10-dihydro-9,10-dioxo-2-anthracenesulfonic acid and sodium salt	03	61.000
1-Amino-2-bromo-4-hydroxyanthraquinone	03	62.000
2-Amino-1-butanol	15	308.000
2-Amino-5-chloropyridine	03	81.500
2-Amino-5-chloro-p-toluenesulfonic acid [SO ₃ H=1]	03	82.000
6-Amino-5-chloro-m-toluenesulfonic acid [SO ₃ H=1] (2B Acid)	03	83.000
p-Aminocyclohexylmethane carbonate	09	156.100
3-Amino-2,5-dichlorobenzolic acid, ammonium salt (2,5-Dichloro-3-aminobenzolic acid, ammonium salt)	13	40.500
4-Amino-N,N-di(β-hydroxyethyl)aniline sulfate	03	91.503
2-Amino-4,6-dihydroxypyrimidine	03	92.100
2-Amino-4,5-dimethoxybenzolic acid, methyl ester	03	92.300
5-Amino-2,3-dimethylbenzenesulfethanolamide	03	92.503
2-Amino-2,3-dimethylbutane	15	308.500
Amino dimethyl butyronitrile	15	434.400
4-Amino-6-(1,1-dimethylethyl)-3-(methylthio)-1,2,4-triazin-5-(4H)-one	13	40.600
2-Aminoethanol hydrochloride	15	309.900
2-Aminoethanol (Monoethanol amine) sulfite	15	310.000

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 4—Continued
Alphabetical chemical index

Chemical name	Sect. Item	
	No.	No.
Aminoethoxyethanol	15	311.000
2-(2-Aminoethylamino)ethanol (Aminoethylethanolamine)	15	312.000
N-Aminoethylaminopropyl trimethoxysilane	15	1378.450
3-Amino-9-ethylcarbazole	03	95.000
(2-Aminoethyl)ethyl(hydrogenated tallow alkyl)(2-hydroxyethyl)ammonium ethyl sulfate	12	448.000
2-Aminoethyl mercaptoacetate (Monoethanolamine thioglycolate)	15	313.000
1-(2-Aminoethyl)-2-nor(tall oil alkyl)-2-imidazolone	12	406.000
Aminoethyl piperazine	15	4.000
1-(2-Aminoethyl)piperazine, technical	15	5.000
2-Amino-2-ethyl-1,3-propanediol	15	314.000
Aminoglutethimide	06	417.000
Aminoguanidine hydrochloride	15	315.020
N-Aminohexamethyleneimine	03	99.100
Aminohippuric acid	06	574.900
2-Amino-2-(hydroxymethyl)-1,3-propanediol [Tris(hydroxymethyl)aminomethane]	15	316.000
4-Amino-3-hydroxy-1-naphthalenesulfonic acid	03	109.000
2-(2-Amino-5-hydroxy-7-sulfo-1-naphthylazo)-5-nitrobenzoic acid	03	113.500
2-Amino-5-mercapto-1,3,4-thiadiazole	14	320.000
3-Amino-4-methoxyacetanilide	03	115.800
4-Amino-5-methoxy-2-methylbenzenesulfonic acid (5-methyl-o-anisidinesulfonic acid)	03	116.803
m-[(4-Amino-3-methoxyphenyl)azo]benzenesulfonic acid	03	118.000
3-Amino-3-methyl-1-butyne	15	316.700
2-Amino-2-methyl-1,3-propanediol	15	317.000
2-Amino-2-methyl-1-propanol	15	319.000
2-Amino-2-methyl-1-propanol hydrochloride	15	320.000
2-Amino-2-methylpropyl 8-bromotheophyllinate	03	130.100
2-Amino-3-methylpyridine	03	133.500
2-Amino-4-methylpyridine	03	133.550
2-Amino-5-methylpyridine	03	133.600
2-Amino-6-methylpyridine	03	134.000
6-Amino-2-naphthalenesulfonic acid (Broenner's acid)	03	159.000
5 (and 8)-Amino-2-naphthol	03	168.000
2-Amino-4-nitroacetanilide	03	169.800
2-Amino-6-nitrobenzothiazole	03	171.202
4-Amino-4'-nitro-2,2'-stilbenedisulfonic acid	03	177.000
2-Amino-5-nitrothiazole	03	178.000
2-Amino-4-nitrotoluene hydrochloride	03	178.400
5-Amino-2-[(2-oxo-5-benzimidazolnyl) amino]benzenesulfonic acid	03	182.000
p-Aminophenol	03	186.000
2-(p-Aminophenoxy)ethanol hydrochloride	03	186.100
p-[(p-Aminophenyl)azo]benzenesulfonic acid	03	188.000

Chemical name	Sect. Item	
	No.	No.
2-(4-Aminophenylazo)-4-methylphenol	03	188.500
7-[(4-Aminophenyl)azo]-1,3-naphthalenedisulfonic acid	03	189.000
Aminophylline	06	745.100
1-(3-Aminopropyl)morpholine	15	6.000
2-Aminopyridine	03	194.000
Amino resins, all other	08	17.500
Aminosallylic acid	06	142.000
2-Aminothiazole nitrate	03	200.050
3-Amino-p-toluamide	03	200.100
4-Amino-m-toluenesulfonic acid [SO ₃ H=1]	03	202.000
6-Amino-m-toluenesulfonic acid [SO ₃ H=1]	03	203.000
m-[(4-Amino-3-tolyl)azo]benzenesulfonic acid	03	206.000
4-Amino-3,5,6-trichloropicolinic acid (Picloram)	13	41.000
Aminotrimethyl phosphonic acid	14	30.000
Amitriptyline	06	524.900
Amitriptyline hydrochloride	06	525.000
Ammonium acetate	15	588.000
Ammonium benzoate	15	9.100
Ammonium citrate	15	621.000
Ammonium heparin	06	623.000
Ammonium isovalerate	07	127.300
Ammonium lactate	15	672.900
Ammonium mercaptoacetate	15	691.000
Ammonium oxalate	15	722.000
Ammonium oxydiethylenedis (alkyl* dimethyl chloride)		
*Alkyl-40% C ₁₂ , 50% C ₁₄ , 10% C ₁₆	13	245.022
Ammonium phenolsulfonate	06	553.000
Ammonium polyacrylate	14	426.000
Ammonium stearate	15	749.000
Amobarbital	06	443.000
Amobarbital, sodium	06	444.000
Amoxicillin (trihydrate)	06	9.600
Amoxicillin (anhydrous)	06	9.500
Amphetamine	06	512.000
Amphetamine sulfate	06	513.000
Amphotericin B	06	1.000
Ampicillin (anhydrous)	06	10.000
Ampicillin (trihydrate)	06	10.100
Ampicillin, sodium	06	11.000
Amprolium	06	166.000
Amyl acetate (n-Pentyl acetate)	15	886.000
Amyl acetates, all other	15	888.000
Amyl alcohol, ethoxylated and phosphated	12	76.050
Amyl alcohol, primary	15	844.100
Amylases, all other	14	98.000
Amyl cinnamyl alcohol	07	5.650
p-tert-Amylcyclohexanone (Orivone)	07	93.600

Table 4—Continued
Alphabetical chemical index

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Chemical name	Sect. Item	
	No.	No.
Amyl cyclohexyl acetate	07	93.900
Amyl p-dimethylaminobenzoate	15	8.000
Amyl hydrogen phosphate	15	1016.500
Amyl nitrite	06	367.000
p-tert-Amylphenol sulfide (Tackifier)	09	124.000
Amyl salicylate	07	5.800
Amyl vinyl carbonyl acetate	07	127.340
Amyris acetate	07	93.650
Anabolic agents and androgens, all other	06	644.000
Analgesics and antipyretics, other than salicylates, all other	06	416.000
Androstenedione	06	644.001
Anhydrosorbitol dioleate	12	589.000
Anhydrosorbitol monoester of tall oil acids	12	590.000
Anhydrosorbitol monolaurate	12	591.000
Anhydrosorbitol mono-oleate	12	592.000
Anhydrosorbitol monopalmitate	12	593.000
Anhydrosorbitol monostearate	12	594.000
Anhydrosorbitol sesquileate	12	596.000
Anhydrosorbitol sesquistearate	12	596.500
Anhydrosorbitol trioleate	12	600.000
Anhydrosorbitol tristearate	12	602.000
Aniline (Aniline oil)	03	212.000
Aniline, ethoxylated	12	342.200
2-Anilinoethanol	03	215.000
7-Anilino-4-hydroxy-2-naphthalenesulfonic acid	03	218.000
Anilinoethanesulfonic acid and salt	03	219.000
p-Anilinophenol	09	66.000
Animal grease, sodium salt	12	52.100
Anionic surface-active agents, all other	12	320.000
p-Anisaldehyde	07	6.000
o-Anisidinomethanesulfonic acid	03	228.000
Anisole, tech.	03	230.000
Anisoyl chloride	03	230.090
Anisyl acetate	07	7.000
Anthranilic acid (o-Aminobenzoic acid)	03	232.000
N,N'-(1,5-Anthraquinonylene)dianthranilic acid	03	237.000
Antibiotics, for medicinal use, all other	06	62.000
Anti-infective agents, all other	06	276.000
Antineoplastic agents, all other	06	283.000
Antiviral agents, all other	06	189.000
l-Arabinose	14	455.000
Arachidylbenzylalkyl amine	12	417.900
Aromatics, C ₆	02	36.010
Arsanilic acid	06	151.000
Aryl alkyl polyether alcohol	14	324.000
Ascorbic acid	06	807.000

Chemical name	Sect. Item	
	No.	No.
Aspartic acid	14	2.000
Aspirin	06	385.000
Atracurium besylate	06	745.200
Aurantol	07	7.100
Aurothioglucose	06	398.000
Avocado amide and avocado oil	12	539.900
1-Aza-3,7-dioxo-5-ethyl bicyclooctane	15	9.200
Azathloprine	06	277.000
Azelaic acid	15	493.000
Azelaic acid esters, all others	11	70.000
1,1'-Azobisformamide	15	229.000
2,2'-Azobis[2-methylpropionitrile] (Azobisisobutyronitrile)	15	435.000
Azolic Black 4	04	251.000
Azolic black compositions, all other	04	253.000
Azolic Blue 3	04	238.000
Azolic Blue 6	04	239.000
Azolic Brown 7	04	245.000
Azolic Brown 9	04	246.000
Azolic brown compositions, all other	04	249.000
Azolic Coupling Component 2	04	297.000
Azolic Coupling Component 4	04	299.000
Azolic Coupling Component 7	04	301.000
Azolic Coupling Component 12	04	305.000
Azolic Coupling Component 14	04	307.000
Azolic Coupling Component 17	04	310.000
Azolic Coupling Component 18	04	311.000
Azolic Coupling Component 20	04	313.000
Azolic Coupling Component 21	04	314.000
Azolic Coupling Component 29	04	316.000
Azolic Coupling Component 34	04	317.000
Azolic Coupling Component 35	04	318.000
Azolic Coupling Component 43	04	319.000
Azolic Diazo Component 4, base	04	256.000
Azolic Diazo Component 5, base	04	257.000
Azolic Diazo Component 13, base	04	262.000
Azolic Diazo Component 14, base	04	263.000
Azolic Diazo Component 32, base	04	265.000
Azolic Diazo Component 34, base	04	266.000
Azolic Diazo Component 1, salt	04	271.000
Azolic Diazo Component 3, salt	04	273.000
Azolic Diazo Component 5, salt	04	275.000
Azolic Diazo Component 8, salt	04	277.000
Azolic Diazo Component 9, salt	04	278.000
Azolic Diazo Component 10, salt	04	279.000
Azolic Diazo Component 11, salt	04	280.000
Azolic Diazo Component 12, salt	04	281.000

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 4—Continued
Alphabetical chemical index

Chemical name	Sect. Item	
	No.	No.
Azoic Diazo Component 13, salt	04	282.000
Azoic Diazo Component 14, salt	04	283.000
Azoic Diazo Component 20, salt	04	284.000
Azoic Diazo Component 32, salt	04	285.000
Azoic Diazo Component 34, salt	04	286.000
Azoic Diazo Component 35, salt	04	287.000
Azoic Diazo Component 42, salt	04	291.000
Azoic Diazo Component 48, salt	04	293.000
Azoic Diazo Component 49, salt	04	294.000
Azoic diazo components, base, all other	04	270.000
Azoic diazo components, salt, all other	04	296.000
Azoic orange compositions, all other	04	226.000
Azoic Red 1	04	227.000
Azoic Red 2	04	228.000
Azoic Red 6	04	229.000
Azoic red compositions, all other	04	234.000
Azoic Violet 1	04	235.000
Azoic violet compositions, all other	04	236.000
Azoic Yellow 1	04	220.000
Aztreonam	06	38.700
Bacillus thuringiensis	13	166.010
Bacitracin (medicinal grade)	06	39.000
Bacitracin (animal feed grade)	06	63.000
Bacterial amylase	14	93.000
Barium acetate	15	589.000
Barium benzoate	15	9.210
Barium cadmium laurate	15	677.000
Barium 2-ethylhexanoate	15	630.000
Barium stearate	15	750.000
Basic black dyes, all other	04	359.999
Basic black dyes, all other, modified	04	420.000
(Basic Blue 7)	05	123.007
Basic Blue 1	04	343.000
Basic Blue 3	04	400.000
Basic Blue 7	04	347.000
Basic Blue 21	04	401.000
Basic Blue 26	04	350.000
Basic Blue 41	04	404.000
Basic Blue 54	04	407.000
Basic Blue 60	04	408.000
Basic Blue 77	04	412.000
Basic Blue 94 and 94:1	04	414.094
Basic Blue 140	04	414.140
Basic blue dyes, all other	04	351.000
Basic blue dyes, all other, modified	04	415.000
(Basic Blue 14, PMA)	05	227.014
(Basic Blue 1, PTA)	05	227.001

Chemical name	Sect. Item	
	No.	No.
Basic Brown 1	04	355.000
Basic Brown 4	04	357.000
Basic brown dyes, all other	04	358.000
Basic Green 1	04	352.000
Basic Green 4	04	354.000
Basic green dyes, all other	04	354.100
(Basic Green 1, PMA)	05	230.101
Basic Orange 1	04	326.000
Basic Orange 2	04	327.000
Basic Orange 21	04	372.000
Basic orange dyes, all other	04	329.000
(Basic Red 1)	05	215.001
Basic Red 12	04	333.000
Basic Red 14	04	383.000
Basic Red 15	04	384.000
Basic Red 17	04	386.000
Basic Red 22	04	389.000
Basic Red 29	04	390.000
Basic Red 46	04	391.046
Basic Red 49	04	392.000
Basic Red 51	04	392.051
Basic Red 54	04	392.054
Basic Red 73	04	392.073
Basic Red 104	04	392.104
Basic Red 111	04	392.111
Basic red dyes, all other	04	334.000
(Basic Red 81, PMA)	05	210.050
(Basic Violet 1)	05	221.001
(Basic Violet 4)	05	221.004
(Basic Violet 10)	05	221.010
Basic Violet 1	04	335.000
Basic Violet 3	04	337.000
Basic Violet 4	04	338.000
Basic Violet 10	04	339.000
Basic Violet 16	04	396.000
Basic Violet 35	04	398.035
Basic violet dyes, all other	04	342.000
Basic Yellow 2	04	323.000
Basic Yellow 11	04	360.000
Basic Yellow 13	04	361.000
Basic Yellow 15	04	362.000
Basic Yellow 24	04	364.000
Basic Yellow 25	04	365.000
Basic Yellow 28	04	367.000
Basic Yellow 29	04	368.000
Basic Yellow 37	04	324.000
Basic Yellow 49	04	370.049

Table 4—Continued
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Chemical name	Sect. Item	
	No.	No.
Basic Yellow 53	04	370.053
Basic Yellow 58	04	370.058
Basic Yellow 65	04	370.065
Basic Yellow 78	04	370.078
Basic Yellow 79	04	370.079
Basic Yellow 83	04	370.083
Basic Yellow 94	04	370.094
Basic Yellow 96	04	370.096
Basic yellow dyes, all other	04	325.000
Basic yellow dyes, all other, modified (Basic Yellow 2), fugitive	04	371.000
Beclomethasone	06	648.500
Behemarnide	15	229.200
N-Behenylarachidyl propylene diamine	12	406.800
Benzaldehyde glyceryl acetal	07	7.500
Benzaldehyde propylene glycol acetal	07	7.550
Benzaldehyde, tech.	03	247.000
Benzalkonium heparin	06	624.500
7-Benzamido-4-hydroxy-2-naphthalenesulfonic acid	03	256.000
Benzanilide	03	259.000
Benzenamine, 4,4'-[(2-chlorophenyl)-methylene]bis[N,N- dimethyl]-	03	261.000
Benzene (Benzol) (90-100%)	01	2.000
Benzene High purity (98-100%)	02	5.500
Benzene-methan ammonium-N,N-dimethyl-N-tetradecyl- chloride	12	448.410
Benzene other	02	6.500
Benzenephosphinic acid	15	9.250
Benzenephosphonic acid	15	9.252
Benzenesulfonic acid	03	264.000
Benzene sulfonic acid	12	137.710
Benzenesulfonic acid, 2-formyl-, sodium salt	03	264.200
Benzenesulfonic acid, 3,3'-(1-methylethylidene)-bis(6- hydroxydisodium salt), polymer with formaldehyde and 4,4'-sulfonylbis(phenol)	12	142.900
Benzenesulfonyl chloride	03	266.000
1,2,4-Benzenetricarboxylic acid, 1,2-dianhydride (Trimellitic anhydride)	03	268.100
Benzhydrol (Diphenylmethanol)	03	269.000
Benzimidazole	03	273.100
Benzocaine	06	704.000
Benzocaine, propoxylated	12	705.180
1,3-Benzodioxole	03	273.500
Benzoic acid	06	134.000
Benzoic acid, 2-[4-(dimethylamino)-benzoyl]-	03	274.850
Benzoic acid, methyl ester	03	274.903
Benzoic acid salts, all other	15	13.000

Chemical name	Sect. Item	
	No.	No.
Benzoic acid, tech.	03	275.000
Benzoin	03	277.000
Benzoin isobutyl ether	03	277.100
Benzonatate	06	425.000
Benzophenone	07	8.000
Benzophenone	03	278.100
Benzothiazole	15	15.000
2-Benzothiazolethiol, sodium salt	03	278.200
1H-Benzotriazole	03	281.000
Benzotriazole, substituted	15	15.500
2H-3,1-Benzoxazine-2,4(1H)-dione	03	282.000
2-Benzoxazolethiol	03	283.200
Benzoyl chloride	03	286.000
Benzoyl peroxide	15	16.000
Benzphetamine hydrochloride	06	535.000
Benzthiazide	06	718.000
Benztropine mesylate	06	308.000
Benzyl acetate	07	9.000
Benzyl alcohol	15	17.000
Benzyl(alkylpyridinium)chloride	12	508.190
Benzylamine	03	289.000
2-(Benzylamino)ethanol	03	290.000
Benzyl (polyoxyethylene, octadecylamine) ammonium chloride with benzyl(polyoxyethylene, tallowamine) ammonium chloride	12	453.230
Benzyl benzoate	07	11.000
Benzyl butyrate	07	12.000
Benzyl chloroformate	15	17.115
Benzyl chloroformate	15	71.115
Benzyl-2-chloro-4-(trifluoromethyl)-5- thiazolecarboxylate	13	175.012
Benzyl cinnamate	07	13.000
Benzyl(coconut oil alkyl)bis(2-hydroxyethyl)ammonium chloride	12	449.000
Benzyl(coconut oil alkyl)dimethylammonium chloride	12	509.000
Benzyl(coconut oil amidopropyl)dimethylammonium chloride	12	470.000
Benzyl-di(hydrogenated tallow alkyl)methylammonium chloride	12	509.900
Benzyl dimethyl (hydrogenated tallow alkyl) ammonium chloride	12	509.980
Benzyl dimethyl(mixed alkyl)ammonium chloride	12	510.000
Benzyl dimethyloctadecylammonium chloride	12	510.950
Benzyl dimethyloctadecylammonium chloride	12	511.000
Benzyl dimethyl oleyl ammonium chloride	12	512.000
Benzyl dimethyl(tallow alkyl)ammonium chloride	12	512.800
Benzyl dimethyltetradecylammonium chloride	12	513.000
Benzyl dodecyl dimethylammonium chloride	12	514.000

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 4—Continued
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Chemical name	Sect. Item	
	No.	No.
Benzyl ether (Dibenzyl ether)	03	292.000
3-(Benzylethylamino)acetanilide	03	292.200
Benzyl formate	07	15.000
Benzylhexadecyldimethylammonium chloride	12	515.000
Benzyl(hydrogenated tallow alkyl)dimethylammonium chloride	12	516.000
2-Benzyl-2'-hydroxy-5,9-dimethyl-6,7-benzomorphanhydrobromide	03	294.950
1-Benzyl-1-(2-hydroxyethyl)-2-nor(tall oil alkyl)-2-imidazoline	12	453.000
Benzyl isobutyrate	07	15.400
Benzyl isopentyl ether	07	15.600
Benzyl isovalerate	07	15.700
Benzyl laurate	07	15.900
Benzyl-methyl-bis(hydrogenated tallow)ammonium chloride	12	516.500
1-(Benzyloxy)-2-methoxy-4-propenylbenzene (Benzyl isoeugenyl ether)	07	16.000
p-(Benzyloxy)phenol	03	297.500
Benzyl phenylacetate	07	17.000
1-Benzyl-4-phenylisonipicotonitrile	03	298.200
Benzyl picolinium chloride	12	517.100
Benzyl(polyoxyethylene cocoamine) ammonium chloride with benzyl (polyoxyethylene, tallowamine) ammonium chloride	12	453.200
Benzyl propionate	07	18.000
Benzyl (mixed alkyl) pyridinium	12	516.650
1-Benzylpyridinium chloride	12	518.000
Benzyl salicylate	07	19.000
Benzyl(tallow alkyl)bis(2-hydroxyethyl)ammonium chloride	12	453.500
Benzyltrimethylammonium chloride	12	519.000
Benzyltrimethylammonium hydroxide	03	300.000
Beta carotene (provitamin A)	06	769.000
Betaine hydrochloride	06	614.000
Betamethasone	06	649.000
Betamethasone dipropionate	06	649.500
Betamethasone sodium phosphate	06	650.000
Betamethasone valerate	06	651.000
Beta methyl ionone coevr	07	104.100
Bethanechol chloride	06	314.500
Biological stains	14	24.000
Biotin	06	794.000
Biphenyl	03	307.000
N,N-Bis(2,2-acetamido)glycine	14	3.000
Bis(alkyl-aryl)alcohols, ethoxylated	12	758.800
Bis(N-Amidopropyl, N,N-dimethyl, N-benzyl ammonium chloride)	12	453.950

Chemical name	Sect. Item	
	No.	No.
Bis(N-amidopropyl)-N,N-dimethyl-N-ethylammonium ethyl sulfate, dimer acid	12	467.500
1,4-Bis(3-aminopropyl)piperazine	03	308.500
2,6-Bis(p-azidobenzylidene)-4-methylcyclohexanone	03	311.400
Bis-behenyl-dimethyl ammonium chloride	12	479.900
1,3-Bis(2-benzothiazolymercaptomethyl) urea	09	24.000
4,4'-bis(2-Benzoxazolyl)stilbene	14	474.000
Bis(2-[bis(2-hydroxyethyl) amino]ethyl) diisopropyl titanate	15	1063.100
Bis-1,4-bromoacetoxy-2-butene	13	176.000
2,2-Bis(bromomethyl)-1,3-propanediol	15	1071.000
Bis(2-butoxyethyl)ether (Diethylene glycol di-n-butyl ether)	15	1142.000
1,1-Bis(carboxymethyl)-2-undecyl-2-imidazolium chloride, disodium salt	12	20.000
Bis[p-chlorobenzoyl]peroxide	15	17.900
Bis(2-chloroethyl)ether (Dichlorodimethyl ether)	15	1300.000
Bis(2-Chloroethyl)-2-chloroethylphosphonate	15	1017.000
Bis(coconut oil alkyl)amine	12	431.000
Bis(coconut oil alkyl)dimethylammonium chloride	12	480.000
Bis[coconut oil alkyl] dimethylammonium nitrate	12	483.025
Bis-cumylphenyl-oxoethylene titanate	12	775.800
Bis(dibutylthiocarbamoyl) disulfide	09	144.950
Bis(2,4-dichlorobenzoyl) peroxide	15	18.000
4,4'-Bis[diethylamino]benzophenone (Ethyl ketone base)	03	320.000
Bis(diethylthiocarbamoyl) disulfide	09	146.000
4,4'-Bis[dimethylamino]benzhydrol (Michler's hydrol)	03	322.000
Bis(dimethylaminoethyl) ether	15	322.900
Bis(α, α -dimethylbenzyl)peroxide	15	19.000
Bis(1,3-Dimethylbutyl)phosphorodithioate oleyl amine salt	14	232.000
N,N'-Bis(1,4-dimethylpentyl)-p-phenylenediamine	09	55.551
Bis(dimethylthiocarbamoyl) disulfide	09	147.000
1,5-Bis[2,4-dinitrophenoxy]-4,8-dinitroanthraquinone	03	325.000
S-[1,2-Bis(ethoxycarbonyl)ethyl]O,O-dimethyl phosphorodithioate (Malathion)	13	215.000
Bis(2-ethoxyethyl)ether (Diethylene glycol diethyl ether)	15	1143.000
Bis(2-ethylhexyl) hydrogen phosphate	15	1018.000
Bis(2-ethylhexyl)hydrogen phosphite	15	1019.000
Bis(2-ethylhexyl)terephthalate	11	16.550
N,N'-Bis(1-ethyl-3-methylpentyl)-p-phenylenediamine	09	56.000
Bis(N,N1-ethyl(stearic/arachidic/behenic)amide) cyanoethyl ethylammonium ethosulfate	12	470.400
2,2-Bis(ferrocenyl)propane	15	19.200
Bis-hexamethylenetriamine amine	15	260.000
Bis(hydrogenated tallow alkyl)amine	12	432.000

Table 4—Continued
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Chemical name	Sect. Item	
	No.	No.
Bis(hydrogenated tallow alkyl)dimethylammonium chloride	12	481.000
Bis(hydrogenated tallow alkyl)dimethylammoniummethyl sulfate	12	482.000
3'-(Bis(2-hydroxyethyl)amino)benzanilide, diacetate ester	03	326.300
Bis-Hydroxyethyl coco amine oxide, phosphated potassium salt	12	321.095
N,N-Bis(2-hydroxyethyl)dodecylamine	12	321.500
Bis(2-hydroxyethyl, ethoxylated)methyl(9-octadecenyl)-ammonium chloride	12	454.000
Bis(2-hydroxyethyl, ethoxylated)methyloctadecylammonium chloride	12	455.000
Bis-2-hydroxyethyl-hydrogenated tallow-ethyl sulfate	12	455.500
Bis-(2-hydroxyethyl)isodecylxypropylamine oxide	12	321.700
Bis(2-hydroxyethyl)methyl soya ammonium chloride	12	455.525
Bis[2-hydroxyethyl]methyl[tallow alkyl]ammonium chloride	12	455.540
N,N-bis-(2-Hydroxyethyl)octadecanamide	14	489.000
N,N-Bis(2-hydroxyethyl)octadecylamine	12	322.000
Bis-2-hydroxyethyl-octyl-methyl-p-toluene sulfonate	12	455.600
N,N-Bis(2-hydroxyethyl)(tallow alkyl)amine	12	324.000
N,N-Bis(2-hydroxyethyl)(tallow alkyl)amine acetate	12	325.000
Bis(2-hydroxyethyl)tallowammonium ethanoate	12	0.500
Bis(hydroxymethyl)oleyl oxazoline	15	20.500
2,2-bis(Hydroxy-methyl)-propionic acid	15	494.500
Bis(hydroxypropyl) azelate	11	66.600
4,6-Bis(Isopropylamino)-2-methoxy-s-triazine (Prometon)	13	118.010
2,4-Bis(Isopropylamino)-6-(methylthio)-s-triazine (Prometryn)	13	41.500
Bis[2-(2-methoxyethoxy)ethyl] ether (Tetraethylene glycol dimethyl ether)	15	1145.000
Bis(2-methoxyethyl)ether (Diethylene glycol dimethyl ether)	15	1146.000
N,N'-Bis(1-methylheptyl)-p-phenylenediamine	09	60.000
N,N-Bis(4-methylphenyl)sulfonylamine, potassium salt	03	327.500
Bis(morpholinothiocarbonyl) disulfide	09	38.500
Bismuth 2-ethylhexanoate	15	630.500
Bismuth neodecanoate	15	701.900
Bismuth subsalicylate	06	154.000
Bis[2-(octadecylamido)ethyl]-N-(2-cyanoethyl)-N-ethyl ammonium ethyl sulfate	15	229.500
Bis(pentachloro-2,4-dicyclopentadien-1-yl)	13	128.000
Bisphenol A, ethoxylated	12	742.090
Bisphenol, hindered	09	88.100
1,3-Bis(Stearyl)dimethyl ammonium chloride-2-propanol	12	455.700
Bis(tallow alkyl)amine	12	432.300
Bis(tallow alkyl)dimethylammonium chloride	12	482.500

Chemical name	Sect. Item	
	No.	No.
1,2-Bis(tribromophenoxy)ethane	03	330.218
Bis(tributyltin) oxide	13	195.015
1,1-Bis[3,3,5-trimethyl]dicyclohexane	15	21.300
Bis(triphenylsilyl)chromate	15	21.400
Bitolylene diisocyanate (TODI)	03	1017.000
Blend of fatty and phosphate esters	12	111.800
Bornyl phenylamine	14	271.000
Boron fluoride - ethyl ether complex	15	1368.000
Boron fluoride - phenol complex	15	22.000
Bromchlorenone	06	251.000
Brominated (Including bromochlorinated) hydrocarbons, all other	15	1216.000
N-Bromoacetamide	15	230.000
Bromoacetic acid	13	245.017
Bromoacetic acid	15	495.000
p-Bromoaniline	03	332.000
Bromobenzaldehyde	03	333.100
Bromobenzene, mono	03	335.000
o-Bromobenzic acid	03	336.000
3-[3-(4'-Bromo[1,1'-biphenyl]-4-yl)-1,2,3,4-tetrahydro-1-naphthalenyl]-4-hydroxy-2H-1-benzopyran-2-one	13	169.500
1-Bromobutane (n-Butyl bromide)	15	1197.000
5-Bromo-3-sec-butyl-6-methyluracil (Bromacil)	13	42.000
Bromobutyric acid	15	496.000
Bromochloro-5,5'-dimethyl hydantoin	15	21.900
Bromochloromethane	15	1199.000
2-Bromo-2-chloro-1,1,1-trifluoroethane	15	1253.000
4-Bromo-3,5-dihydroxybenzamide	03	343.503
4-Bromo-3,5-dihydroxybenzoic acid	03	343.700
2-Bromo-4,6-dinitroaniline	03	344.000
Bromoethane (Ethyl bromide)	15	1202.000
1-Bromo-4-ethoxy-2-methylbenzene	03	344.900
p-Bromofluorobenzene	03	345.500
1-Bromohexadecane	15	1202.990
1-Bromohexane (n-Hexyl bromide)	15	1203.000
2-Bromo-4'-hydroxyacetophenone	13	40.017
1-Bromo-2-methyl-2-butene	15	1205.000
1-Bromonaphthalene	03	354.000
β -Bromo- β -nitrostyrene	15	22.400
1-Bromo-octadecane	15	1206.000
1-Bromopropane (n-Propyl bromide)	15	1209.000
3-Bromo-propyl-amine hydrobromide	07	127.460
2-Bromopyridine	03	359.000
Bromotrifluoromethane	15	1254.000
Brompheniramine maleate	06	85.000
Butabarbital	06	447.000
Butabarbital, sodium	06	448.000

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 4—Continued
Alphabetical chemical index

Chemical name	Sect. Item	
	No.	No.
Butadiene and butylene fractions	02	49.000
1,3-Butadiene, grade for rubber (Elastomers)	02	48.000
Butalbital	06	449.000
Butamben	06	706.990
n-Butane	02	44.000
1,2(and 1,3)-Butanediol	15	1072.000
1,4-Butanediol	15	1073.000
1,4-Butanediol diglycidyl ether	15	1317.400
Butanediol, ethoxylated	12	758.900
Butanol, ethoxylated	12	726.900
2-Butanol, ethoxylated and propoxylated	12	726.910
Butanol residue stream	15	1429.000
2-Butanone peroxide	15	1284.000
1-Butene	02	45.000
2-Butene	02	46.000
1-Butene and 2-butene, mixed	02	47.000
2-Butenedioic acid(ε)-linoleic acid, reaction product	15	1296.570
2-Butene-1,4-diol	15	1074.000
2,3,4,5-δ ² -Butenylene-tetrahydrofurfural	13	166.014
1-Butoxy-2,3-epoxypropane (Butyl glycidyl ether)	15	1317.460
2-Butoxyethanol (Ethylene glycol monobutyl ether)	15	1147.000
2-(2-Butoxyethoxy)ethanol (Diethylene glycol monobutyl ether)	15	1148.000
2-[2-(2-Butoxyethoxy)ethoxy]ethanol (Triethylene glycol monobutyl ether)	15	1149.000
α-[2-(2-n-Butoxyethoxy)ethoxy]-4,5-methylenedioxy-2-propyloleone (Piperonyl butoxide)	13	172.000
2-(2-Butoxyethoxy)ethyl acetate	15	1098.000
1-Butoxyethoxy-2-propanol	15	1150.000
2-Butoxyethyl acetate	15	1099.000
2-Butoxyethyl benzoate	15	22.990
Butoxyethylene oxyacetic acid, sodium salt	12	35.950
2-Butoxyethyl oleate	11	89.900
p-Butoxyphenol	03	364.000
n-Butyl acetate	15	890.000
n-Butyl acetyricinoleate	11	106.000
Butyl acrylate	15	893.000
Butyl acrylate ethyl acrylate copolymer resins	08	19.950
n-Butyl alcohol (n-Propylcarbinol)	15	845.000
sec-Butyl alcohol (Methylethylcarbinol)	15	846.000
tert-Butyl alcohol (Trimethylcarbinol)	15	847.000
Butyl alcohol, ethoxylated and phosphated	12	76.100
Butyl alcohol, propoxylated	12	734.950
n-Butylamine, mono	15	261.000
sec-Butylamine, mono	15	264.000
tert-Butylamine, mono	15	265.000
2-(sec-Butylamino)-4-ethylamino-6-methoxy-s-triazine	13	118.041

Chemical name	Sect. Item	
	No.	No.
2-(tert-Butylamino)-4-ethylamino-6-(methylthio)-s-triazine	13	118.017
tert-Butylaminoethyl methacrylate	15	327.455
p-Butylaniline	03	368.000
3-(N-Butylanilino)propionitrile	03	368.500
Butylated hydroxyanisole	15	22.600
p-tert-Butylbenzaldehyde	03	370.000
n-Butylbenzene	03	371.000
N-n-butyl benzenesulfonamide	11	0.500
Butyl benzoate	15	23.000
N-tert-Butyl-2-benzothiazolesulfenamide	09	25.000
tert-Butylbenzylamine	12	323.700
Butyl benzyl phthalate	11	17.000
n-Butyl-4,4-bis[t-butylperoxy]valerate	15	1284.200
Butyl butyrl lactate	07	127.500
n-Butyl chlorocrotonate	15	896.400
sec-Butyl chloroformate	15	898.000
3-tert-Butyl-5-chloro-6-methyluracil	13	118.018
2-tert-Butyl-p-cresol	03	377.000
6-tert-Butyl-m-cresol	03	376.000
2-tert-Butyl cyclohexanol	07	93.710
2-sec-Butylcyclohexanone	07	93.700
p-tert-Butylcyclohexyl acetate (Verbeniax)	07	94.000
4-tert-Butylcyclohexyl peroxydicarbonate	15	23.500
tert-Butyldiethanolamine	15	327.500
4-terc-Butyl-2',6'-dimethyl-3',5'-dinitroacetophenone (Musk ketone)	07	20.000
Butylene glycol adipate	11	58.750
1,3-Butylene glycol diborate	15	1100.150
1,3-Butylene glycol diborate/hexylene glycol boric anhydride	15	1100.155
1,3-Butylene glycol, ethoxylated	12	758.940
Butylene glycol glutarate	11	85.050
Butylene oxide	15	1303.000
Butyl ether (Di-n-butyl ether)	15	1304.000
Butyl ethers of tetra- and higher ethylene glycols (high boiling)	15	1151.500
n-Butylethylamine	15	267.000
Butyl 2-ethylhexyl phthalate	11	21.000
Butyl ethyl magnesium	15	1374.800
1-Butyl-3-ethyl-2-thiourea	15	328.000
N-Butyl-N-ethyl-α,α,α-trifluoro-2,6-dinitro-p-toluidine (Benefin)	13	43.000
Butyl formcel	15	1430.000
Butyl hydrogen phosphate	15	1021.000
tert-Butyl hydroperoxide	15	1285.000
tert-Butylhydroquinone	15	24.850

APPENDIX D

Table 4—Continued
Alphabetical chemical index

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Chemical name	Sect. Item	
	No.	No.
4,4'-Butyldenebis(6-tert-butyl-m-cresol)	09	88.200
Butyl(isobutylene-isoprene) type	10	9.000
Butyl and isopropyl phthalimides	15	27.495
Butyl lactate	15	900.000
n-Butylaluminum	15	1372.000
sec-Butylaluminum	15	1373.000
Butyl maleate	15	901.000
n-Butyl mercaptan (1-Butanethiol)	02	90.910
sec-Butyl mercaptan (2-Butanethiol)	02	90.915
tert-Butyl mercaptan (2-Methyl-2-propanethiol)	02	91.000
Butyl mercaptopropionate	15	901.800
Butyl methacrylate	15	902.000
Butyl methacrylate-ethyl methacrylate copolymer resins	08	19.960
2-(and 3)-tert-Butyl-4-methoxyphenol (BHA)	15	25.000
p-tert-Butyl-o-methylhydrocinnamalehyde	07	21.900
2-[(1-Butyl-2-methylindol-3-yl)carbonyl]benzoic acid	03	382.200
Butyl methyl pyrophosphate ethylenedioxy titanium salt/n, n-dimethyl amino ethyl methacrylate salt	12	102.205
Butyl methyl pyrophosphate isopropoxy titanium salt octyl phosphite adduct	12	92.300
Butylmorpholine	15	25.500
Butyl myristate	12	705.200
Butylnaphthalenesulfonic acid, sodium salt	12	162.000
Butyl octyl phthalates	11	23.000
Butyl oleate	11	90.000
Butyl oleate	15	909.000
Butyl oleate, sulfated, sodium salt	12	257.000
n-Butyl palmitate	11	96.200
tert-Butyl peroxide (Di-tert-butyl peroxide)	15	1286.000
tert-Butyl peroxyacetate	15	903.000
tert-Butyl peroxybenzoate	15	26.000
tert-Butyl peroxy-2-ethylhexanoate	15	904.000
tert-Butyl peroxyisobutyrate	15	905.000
tert-Butyl peroxyisopropylcarbonate	15	907.000
tert-Butylperoxy maleic acid	15	498.000
tert-Butyl peroxyneodecanoate	15	908.000
tert-Butyl peroxyvalate	15	910.000
tert-Butyl peroxy-3,5,5-trimethyl cyclohexane	15	26.500
o-sec-Butylphenol	03	383.000
o-tert-Butylphenol	03	385.000
p-sec-Butylphenol	03	384.000
p-tert-Butylphenol	03	386.000
Butylphenols, mixed	03	387.000
2-(p-tert-Butylphenoxy)cyclohexyl-2-propynyl sulfite	13	168.017
N-(3-(p-tert-butylphenyl)-2-methylpropylidene)- anthranilic acid, methyl ester	07	21.920
Butyl-o-phenylphenol sulfonic acid, sodium salt	12	162.100

Chemical name	Sect. Item	
	No.	No.
N-sec-Butyl-N-phenylphenylenediamine	14	155.000
Butyl phosphate, potassium salt	12	92.500
Butyl phthalyl butyl glycolate	11	41.400
Butyl picolinium bromide	12	519.500
Butyl and propyl oleate, sulfated, sodium salt	12	257.300
Butyl ricinoleate	11	107.000
Butyl stearate	15	911.000
n-Butyl stearate	11	117.000
p-tert-Butyltoluene	03	388.000
Butyl 2-[4-[[5-(trifluoromethyl)-2- pyridinyl]oxy]phenoxy]propanoate	13	43.050
5-tert-Butyl-1,2,3-trimethylbenzene	03	389.000
1-tert-Butyl-3,4,5-trimethyl-2,6-dinitrobenzene (Musk tibetene)	07	22.000
5-tert-Butyl-2,4,6-trinitro-m-xylene (Musk xylol)	07	23.000
Butyl undecylenate	07	127.650
Butyl vinyl ether	15	1305.000
5-tert-Butyl-m-xylene	03	390.000
6-tert-Butyl-2,4-xyleneol	03	391.000
2-Butyne-1,4-diol	15	1075.000
Butynediol, ethoxylated	12	758.950
Butyraldehyde	15	784.000
Butyraldehyde-aniline condensate	09	52.000
n-Butyraldehyde-butylamine condensate	09	156.800
Butyraldehyde diethyl acetal	07	127.655
Butyric acid	15	499.000
Butyric anhydride	15	500.000
Butyrolactone	15	104.500
n-Butyronitrile	15	436.000
Butyryl chloride	15	501.000
Cadlone	07	94.100
Cadmium benzoate	15	10.000
Cadmium 2-ethylhexanoate	15	631.000
Cadmium naphthenate	14	297.000
Cadmium stearate	15	751.000
Cadmium tallate	15	169.500
Caffeine, natural	06	537.000
Caffeine, synthetic	06	538.000
Calcitonin	06	691.500
Calcium acetate	15	591.000
Calcium t- α -alkylcarboxylate	15	668.000
Calcium citrate	15	622.000
Calcium 2-ethylhexanoate	15	632.000
Calcium gluceptate	06	759.000
Calcium lactate	15	673.000
Calcium linoleate	15	681.000
Calcium manganese tallate	15	170.000

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 4—Continued
Alphabetical chemical index

Chemical name	Sect. Item	
	No.	No.
Calcium mercaptoacetate	15	693.000
Calcium naphthenate	14	298.000
Calcium neodecanoate	15	703.000
Calcium oleate	15	718.500
Calcium polycarbophil	06	591.600
Calcium propionate	15	737.000
Calcium ricinoleate	15	740.000
Calcium stearate	15	752.000
Calcium tallate	15	171.000
Calcium undecylenate	06	135.000
Camphene	15	29.000
α-Campholenic aldehyde	07	94.200
Canrenoate, potassium	06	736.700
Canrenoate, potassium	07	111.500
Capreomycin	06	253.500
Capric acid (Ratio =2/1)	12	530.000
Capric acid (Ratio=1/1)	12	546.010
Caprolactam (2-Oxohexamethylenimine)	15	29.500
Caprolactam magnesium bromide	15	29.505
Caprolactone	15	104.600
3-[Caprylamidoethylene-(2-hydroxyethyl)amino]propionic acid	12	0.700
Caprylampropionate	12	9.800
Caprylic acid tetraethylene-pentamine condensate	12	358.700
Caprylic amphopropionate	12	705.300
Captopril	06	355.400
Caramiphen edisylate	06	426.000
Carbarsonne	06	155.000
Carbenicillin, disodium	06	12.000
Carbenicillin indanyl, sodium	06	12.500
Carbidopa	06	830.500
1-(Carboethoxy)ethyl-3-(2-chloro-4-(trifluoromethyl)phenoxy)benzoate	03	398.000
2-Carbomethoxy-1-propen-2-yl dimethyl phosphate	13	216.000
Carbon black feedstock	02	36.050
Carbon Black oil	01	21.010
Carbon disulfide	15	1296.600
Carbon tetrachloride	15	1217.000
Carboplatin	06	278.100
1-Carboxyethyl-1-(2-ethoxycarboxyethyl)-2-cocoimidazolium, disodium salt	12	21.150
1-Carboxyethyl-1-(2-hydroxyethyl)-2-heptyl-2-imidazolium hydroxide, sodium derivative, sodium salt	12	21.200
1-Carboxyethyl-1-(2-hydroxyethyl)-2-nonyl-2-imidazolium hydroxide, sodium derivative, sodium salt	12	21.250

Chemical name	Sect. Item	
	No.	No.
(1-Carboxyheptadecyl)trimethylammonium hydroxide, inner salt	12	1.000
5(or 6)carboxy-4-hexyl-2-cyclohexene-1-octanoic acid, potassium/sodium salts	12	52.500
5(or 6)-Carboxy-4-hexyl-2-cyclohexene-1-octanoic acid, reaction products with castor oil	12	38.500
Carboxylic acid -- alkanolamine condensates, all other	12	582.000
Carboxylic acid amides, all other	12	588.000
Carboxylic acid-diamine and polyamine condensate, all other	12	587.000
Carboxylic acid-diamine and polyamine condensates, all other	12	374.000
Carboxylic acid esters, all other	12	721.000
Carboxylic acids, all other	12	75.000
Carboxylic acids with amide, ester or ether linkage, other	12	51.000
Carboxymethyl-3-cocoamidopropyl dimethyl ammonium chloride, sodium salt	12	3.980
(Carboxymethyl)[3-(coconut oil amido)propyl]dimethylammonium hydroxide, inner salt	12	4.000
1-Carboxymethyl-2-heptadecyl-1-(2-hydroxyethyl)-2-imidazolium hydroxide, sodium derivative, sodium salt	12	22.000
1-Carboxymethyl-1-(2-hydroxyethyl)-2-heptyl-2-imidazolium hydroxide, sodium derivative, sodium salt	12	22.600
1-Carboxymethyl-1-(2-hydroxyethyl)-2, imidazolium hydroxide sodium derivative, sodium salt	12	23.200
1-Carboxymethyl-1-(2-hydroxyethyl)-2-nonyl-2-imidazolium hydroxide, sodium derivative, sodium salt	12	24.000
1-Carboxymethyl-1-(2-hydroxyethyl)-2-undecyl-2-imidazolium hydroxide, sodium derivative, sodium salt	12	25.000
1-Carboxymethyl-1-(2-hydroxyethyl)-2-undecyl-2-imidazolium hydroxide, sodium derivative, sodium salt	12	21.300
(Carboxymethyl)-3-(lauryl amido propyl dimethyl ammonium hydroxide inner salt	12	21.400
Carnauba wax, ethoxylated	12	668.950
Carprofen	06	399.150
Carvacrol	07	23.500
l-Carvone	07	94.300
β-Caryophyllene	07	94.500
Caryophyllene oxide	07	94.600
Castor oil acids (Ratio = 2/1)	12	531.000
Castor oil acids, sodium salt	12	53.000
Castor oil, ethoxylated	12	669.000
Castor oil fatty acids, dehydrated	15	502.000

APPENDIX D

Table 4—Continued
Alphabetical chemical index

Chemical name	Sect. No.	Item No.
Castor oil, sulfated, sodium salt	12	305.000
Catechol (Pyrocatechin)	14	328.000
Cationic cellulose ether	14	406.000
Cationic surface-active agents, all other	12	529.000
α -Cedrene epoxide (Andrane)	07	94.760
Cedrenol	07	94.780
Cedrol	07	94.790
Cedryl acetate	07	94.800
Cedryl formate	07	94.810
Cefaclor	06	39.300
Cefamandole	06	39.500
Cefazolin, sodium	06	40.000
Cefonicid	06	40.100
Cefoxitin	06	40.200
Ceftazidime	06	255.500
Celkose acetate	14	384.000
Celkose acetate	08	20.990
Celkose acetate butyrate	08	21.000
Celkose acetate hexahydrophthalate	15	29.900
Celkose acetate phthalate	15	30.000
Celkose acetate propionate	08	21.010
Celkose ethers and esters, all other	14	413.000
Celkose, oxidized	06	635.000
Celkose plastics, all other	08	21.040
Celtone	15	1430.250
Cephalexin	06	41.000
Cephaloridine	06	42.000
Cephalothin, sodium	06	43.000
Cephapirin	06	43.200
Cephapirin, sodium	06	43.300
Cephradine	06	43.600
Ceteryl alcohol and ethoxylated ceteryl alcohol	12	758.960
Cetylalcosyl methacrylate	15	911.700
Cetyl lactate	15	912.000
Cetylpyridinium chloride	06	256.000
Chelating agents, nitroacids and salts, all other	14	90.000
Chemical indicators	14	91.000
Chemically defined linear alcohol, alkoxyated, all other	12	734.000
Chemical reagents and fine chemicals	14	92.000
Chlorinated (not otherwise halogenated) hydrocarbons, all other	15	1252.000
Chlorinated insecticides, cyclic, all other	13	147.000
Chlorinated paraffins, 35-64% chlorine	15	1219.000
Chlorinated paraffins, less than 35% chlorine	15	1218.000
Chlorinated paraffins, 65% or more chlorine	15	1220.000
Chloroacetic acid, mono	15	503.000

Chemical name	Sect. No.	Item No.
Chloroacetic acid, sodium salt	15	620.000
4'-Chloroacetophenone	03	411.000
N-(Chloroacetyl)-N-(2,6-diethylphenyl) glycine, ethyl ester	13	43.025
1-(3-Chloroallyl)-3,5,7-triazo-1-azoniaadamantane chloride	15	32.000
o-Chloroaniline	03	414.000
m-Chloroaniline	03	413.000
p-Chloroaniline	03	415.000
p-Chlorobenzaldehyde	03	425.000
Chloro-7H-benz[de]anthracen-7-one (Chlorobenzanthrone)	03	426.000
Chlorobenzene, mono	03	427.000
p-Chlorobenzenesulfonic acid	03	430.000
4-Chloro-2-benzothiazolemine	03	435.100
5-Chlorobenzotriazole	14	329.000
4-Chloro-2,6-bis(2,4-dihydroxybenzyl)phenol	09	124.200
2-Chloro-4,6-bis(ethylamino)-s-triazine (Simazine)	13	44.050
2-Chloro-4,6-bis(isopropylamino)-s-triazine (Propazine)	13	44.100
1-Chlorobutane (n-Butyl chloride)	15	1221.000
Chlorobutanol	06	257.000
Chlorobutyl formol	15	1296.630
2-Chloro-1,4-dibutoxybenzene	03	440.780
1-Chloro-2,5-dibutoxy-4-nitrobenzene	03	440.803
2-Chloro-1,4-diethoxybenzene	03	440.900
1-Chloro-2,5-diethoxy-4-nitrobenzene	03	441.000
3-Chloro-4-diethylaminobenzene diazonium chloride (p-Diazo-2-chloro-N,N-diethylaniline zinc chloride)	14	330.000
2-Chloro-2',6'-diethyl-N-(n-butoxymethyl)acetanilide (Butachlor)	13	44.160
2-Chloro-N,N-diethylethylamine hydrochloride	15	333.000
2-Chloro-2',6'-diethyl-N-(methoxymethyl)acetanilide (Alachlor)	13	44.180
1-Chloro-1,1-difluoroethane	15	1255.000
Chlorodifluoromethane (F-22)	15	1256.000
4'-Chloro-2',5'-dimethoxyacetanilide	03	448.000
5-Chloro-2,4-dimethoxyaniline	03	450.000
2-[p-Chloro- α -(2-dimethylaminoethyl)benzyl]pyridine	03	451.300
2-Chloro-10-[3-(dimethylamino)propyl]phenothiazine	03	451.600
2-Chloro-N,N-dimethylethylamine (Dimethylamino ethyl chloride) hydrochloride	15	334.000
1-Chloro-2,4-dinitrobenzene (Dinitrochlorobenzene)	03	453.000
2-Chloro-N-(2,6-dinitro-4-(trifluoromethyl)phenyl)-N-ethyl-6-fluorobenzenemethanamine	13	168.135
3-Chlorodiphenylamine	03	457.000
2-Chloro-N-ethoxymethyl-N-(2-ethyl-6-methylphenyl)acetamide (Acctochlor)	13	44.190

Table 4—Continued
Alphabetical chemical index

Chemical name	Sect. No.	Item No.
2-Chloro-1-(3-ethoxy-4-nitrophenoxy)-4-(trifluoromethyl) benzene (Oxyfluorfen)	13	118.044
2-Chloro-4-(ethylamino)-6-(isopropylamino)-s-triazine (Atrazine)	13	45.000
2-[4-Chloro-6-(ethylamino)-s-triazin-2-ylamino]-2-methylpropanitrile (Cyanazine)	13	45.100
N-(2-Chloroethyl)-N-ethylaniline	03	462.000
p-[(2-Chloroethyl)methylamino]benzaldehyde	03	463.000
2-(Chloroethyl)phosphonic acid	13	231.250
Chloroform	15	1224.000
Chlorohydroquinone	14	332.000
2-Chloro-N-isopropylacetanilide (Propachlor)	13	45.200
Chloromethane (Methyl chloride)	15	1226.000
2-Chloro-N-[(4-methoxy-6-methyl-1,3,5-triazin-2-yl) aminocarbonyl]benzenesulfonamide	13	118.054
Chloromethoxypropylmercuric acetate	13	177.100
Chloromethyl methyl ether	15	1307.000
4-Chloro-2-methylphenoxyacetic acid, dimethylamine salt	13	109.011
4-Chloro-2-methylphenoxyacetic acid, iso-octyl ester	13	109.010
2-(4-Chloro-2-methylphenoxy)propionic acid, dimethylamine salt	13	118.048
3-Chloro-2-methyl-1-propene (Methyl chloride)	15	1228.000
2-[(Chloromethyl)thio]benzothiazole	03	486.500
1-Chloro-2-nitrobenzene (Chloro-o-nitrobenzene)	03	495.000
1-Chloro-4-nitrobenzene (Chloro-p-nitrobenzene)	03	498.000
4-Chloro-3-nitrobenzenesulfonamide	03	500.000
2-Chloro-4-nitrobenzoic acid	03	506.000
2-Chloro-5-nitrobenzoic acid	03	507.000
2-Chloro-4-nitrobenzoic acid, potassium salt	03	508.030
4-Chloro-3-nitrobenzotrifluoride	03	508.100
α -Chloro-4-nitrotoluene	03	511.900
2-Chloro-4-nitrotoluene	03	512.000
5-Chloro-2-pentanone	15	811.000
o-Chlorophenol	03	517.000
2-Chlorophenothiazine	03	519.000
1-(4-Chlorophenoxy)-3,3-dimethyl-1-(1,2,4-triazol-1-yl) butan-2-one	13	40.009
α -(2-Chlorophenyl)- α -(4-chlorophenyl)-5-pyrimidinmethanol	13	40.020
o-Chlorophenylcyclopentyl ketone	03	522.300
4-Chloro-o-phenylenediamine	03	523.000
α -(2-Chlorophenyl)- α -(4-fluorophenyl)-5-pyrimidinmethanol	13	40.019
β -(4-Chlorophenyl)methyl- α -(1,1-dimethylethyl)-1,2,4-triazole-1-ethanol	13	168.994
2-(2-Chlorophenyl)methyl-4,4-dimethyl-3-isoxazolidinone	13	166.051
2-(2-Chlorophenyl)methyl-4,4-dimethyl-3-isoxazolinone	13	118.067

Chemical name	Sect. No.	Item No.
4-Chlorophthalic acid	03	528.000
1-Chloroplnacolone	15	812.320
3-Chloro-1,2-propanediol (Glycerol α -chlorohydrin)	15	1076.000
Chloro-2-propanone (Chloroacetone)	15	813.000
3-Chloropropene (Allyl chloride)	15	1229.000
α -Chloropropyltrichlorosilane	15	1379.000
Chloropropyltrimethoxysilane	15	1380.000
3-Chloropropyl-2,5-xlyyl ether	03	530.070
2-Chloropyridine	03	532.000
4-Chlororesorcinol	03	537.000
2-(4-Chlorosulfonylphenyl)ethyltrichlorosilane	03	539.200
Chlorosulfurized sperm oil	14	197.000
7-Chloro-1,2,3,4-tetrahydro-2-methyl-3-(2-methylphenyl) 4-oxo-6-quinazolonesulfonamide	03	539.500
Chlorothioxanthone	15	34.600
Chlorothiazide	06	719.000
o-Chlorotoluene	03	543.000
m-Chlorotoluene	03	542.000
p-Chlorotoluene	03	544.000
α -Chlorotoluene (Benzyl chloride)	03	545.000
3-Chloro-p-toluidine [NH ₂ =1]	03	547.000
2-Chloro-6-(trichloromethyl)pyridine	13	168.991
Chlorotrifluoroethylene (Trifluorovinyl chloride)	15	1258.000
Chlorotrifluoromethane	15	1259.000
2-Chloro-N-[[[4-(trifluoromethoxy) phenyl]amino]carbonyl]benzamide	13	133.200
3-(2-Chloro-4-trifluoromethylphenoxy)toluene	03	556.050
p-Chloro- α, α, α -trifluorotoluene	03	558.000
Chlorotrimethylsilane	15	1381.000
p-Chloro-o-xylene	03	563.500
4-Chloro-3,5-xlyenol	03	565.000
Chlorphenesin carbamate	06	477.000
Chlorpheniramine maleate	06	89.000
Chlorpheniramine tannate	06	90.000
Chlorpromazine hydrochloride	06	484.000
Chlortetracycline (animal feed grade)	06	64.000
Chlortetracycline (medicinal grade)	06	31.000
Cholecalciferol (vitamin D ₃)	06	811.000
Choleretics and hydrocholeretics, all other	06	604.000
Cholesterol esterase	14	110.000
Cholesterol oxidase	14	122.000
Choline	15	342.000
Choline bicarbonate	06	605.000
Choline bitartrate	06	606.000
Choline chloride (animal feed grade)	06	607.000
Choline chloride (medicinal grade)	06	608.000
Choline dihydrogen citrate	06	611.000

Table 4—Continued
Alphabetical chemical index

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Chemical name	Sect. No.	Item No.
Choline magnesium salicylate	06	385.300
Chromium acetate	15	592.000
Chromium acetylacetonate complex	15	1371.100
Chromium 2-ethylhexanoate	15	632.500
Chromium naphthenate	14	299.000
Cimetidine	06	619.400
Cimetidine hydrochloride	06	619.600
Cineole [eucalyptol]	07	23.700
Cinnamaldehyde	07	24.000
Cinnamic aldehyde dimethyl acetal	07	24.200
Cinnamyl acetate	07	25.000
Cinnamyl alcohol	07	26.000
Cinnamyl butyrate	07	27.100
Cinnamyl cinnamate	07	27.200
Cinnamyl nitrile	07	27.500
Cinnamyl propionate	07	28.000
Cisplatin	06	278.200
Citral dimethyl acetal	07	127.700
Citric and acetylcitric acid esters, all other	11	71.000
Citric acid	15	505.000
Citric acid, sodium salts (50%) in sodium phosphates (20%)	12	53.500
Citronellal acid	07	127.950
Citronellal acetate	07	128.000
Citronellal ethyl ether	07	131.700
Citronellal formate	07	130.000
Citronellal isobutyrate	07	131.000
Citronellal propionate	07	131.500
Citrandamycin	06	45.000
Clorazepate dipotassium	06	498.000
Cloxacillin, benzathine	06	20.001
Cloxacillin, sodium	06	13.000
Cobalt acetate	15	593.000
Cobalt t- α -alkylcarboxylate	15	669.000
Cobalt 2-ethylhexanoate	15	633.000
Cobalt manganese acetate	15	593.010
Cobalt manganese tartrate	15	172.010
Cobalt naphthenate	14	301.000
Cobalt neodecanoate	15	705.000
Cobalt-potassium 2-ethylhexanoate	15	633.010
Cobalt stearate	15	753.000
Cobalt tartrate	15	172.000
N-Cocoalkyl-1,3-propylenediamine acetate	13	245.011
Cocoamide diethanolamine-amine lauryl sulfate	12	470.700
Cocoamidoamphoglycinate	12	9.250
3-Cocoamido-N,N-dimethyl propylamine oxide	12	385.285
Cocoamidopropyl betaine	12	9.255

Chemical name	Sect. No.	Item No.
Cocoamidopropyl dimethyl amine	12	328.300
Cocoamidopropyl dimethyl amine oxide	12	385.280
N-Cocoamido-propyl-N,N-dimethylamine oxide	12	9.580
3-[(3-(Cocoamidopropyl)dimethylammonio]-2-hydroxypropane sulfonate	12	9.600
(3-Cocoamidopropyl)(2-hydroxy-3-sulfopropyl)dimethyl hydroxide, inner salt	12	9.720
(3-Cocoamidopropyl)-(2-hydroxy-3-sulfopropyl)-dimethyl ammonium hydroxide, inner salt	12	9.650
3-Cocoamidopropyl-2-hydroxy-3-sulfopropyl dimethyl ammonium hydroxide, inner salt	12	9.700
Cocoaminoamide	12	587.900
Cocoamphocarboxyglycinate	12	9.260
Cocoamphocarboxypropionate	12	9.265
Cocoamphopropionate	12	9.280
Cocodimethyl ethyl ammonium ethyl sulfate	12	482.750
N-coco- γ -hydroxybutyramide	15	232.100
Coconitrile	15	437.000
Coconut acids, modified	12	546.004
2-Coconut-1-ethyl oxypropionic acid, sodium salt	12	10.305
Coconut oil acids	12	569.000
Coconut oil acids (Ratio = 1/1)	12	564.000
Coconut oil acids (Ratio = 2/1)	12	532.000
Coconut oil acids (Ratio = 1/1)	12	546.000
Coconut oil acids (Ratio = 2/1)	12	556.000
Coconut oil acids	12	554.000
Coconut oil acids, diethanolamine salt	12	29.100
Coconut oil acids-dimethylaminopropylamine condensate (amine/acid ratio = 1/1)	12	586.480
Coconut oil acids-ethanolamine condensate, ethoxylated	12	576.000
Coconut oil acids, ethanolamine salt	12	29.200
Coconut oil acids-ethanolamine salt, sulfated, potassium salt	12	248.000
Coconut oil acids, potassium salt	12	54.000
Coconut oil acids, sodium salt	12	55.000
Coconut oil acids, 2-sulfoethyl ester, sodium salt	12	198.000
Coconut oil acids, triethanolamine salt	12	29.000
N-(Coconut oil acyl)-N-methylaurine, sodium salt	12	183.000
N-(Coconut oil acyl)sarcosine, sodium salt	12	40.000
Coconut oil alcohol, ethoxylated	12	735.000
N-(Coconut oil alkyl)- β -alanine, partial sodium salt	12	10.100
N-(Coconut oil alkyl)- β -alanine, sodium salt	12	10.000
3-[(Coconut oil alkyl)amidoethylene-(2-hydroxyethyl) amino]propionic acid	12	10.130
(Coconut oil alkyl)amine	12	418.000
(Coconut oil alkyl)amine, ethoxylated	12	326.000
(Coconut oil alkyl)amine, ethoxylated, acetate	12	327.000

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 4—Continued
Alphabetical chemical index

Chemical name	Sect. Item	
	No.	No.
(Coconut oil alkyl)amine, ethoxylated, diethosulfate	12	455.970
N-[(Coconut oil alkyl)amino]butyric acid	12	10.150
N-[(Coconut oil alkyl)amino]butyric acid, sodium salt	12	483.000
(Coconut oil alkyl)bis(2-hydroxyethyl, ethoxylated)-methylammonium chloride	12	456.000
N-(Coconut oil alkyl)sulfosuccinamic and disodium salt	12	176.950
N-(Coconut oil alkyl)trimethylenediamine	12	407.000
Coconut oil amide	15	232.000
Coconut oil, ethoxylated	12	669.200
Coconut oil fatty acid polyoxyethylene	12	456.100
Coconut oil, sulfated, sodium salt	12	306.000
Coconut oil and talow acids (Ratio = 2/1)	12	533.000
Coconut and soybean oil acids	12	564.050
Cocoyl amidopropyl dimethylamine oxide	12	327.600
Codeine	06	429.000
Cod oil, sulfated, sodium salt	12	298.000
Colestipol hydrochloride	06	614.500
Complex linear polyesters and polymeric plasticizers, all other	11	132.000
Copolyurethane urea	14	386.000
Copper acetate	15	594.000
Copper t- α -alkylcarboxylate	15	669.050
Copper 2-ethylhexanoate	15	634.000
Copper gluconate	06	762.000
Copper naphthenate	14	302.000
Copper oleate	15	718.000
Corn oil acids, potassium salt	12	56.000
Corticosteroids, all other	06	670.000
Corticotropin	06	692.000
Cortisone acetate	06	653.000
Coumarin	07	29.000
Coumarone-indene resins	08	22.000
Creosote oil (Dead oil): creosote content in solution (100% basis)	01	21.000
Creosote oil (Dead oil): creosote in coal tar solution (100% solution basis)	01	20.000
Creosote oil (Dead oil): distillate as such (100% creosote basis)	01	19.000
m-Cresol	03	569.000
p-Cresol	03	572.000
o-Cresol, from petroleum	03	571.000
(m,p)-Cresol, from petroleum	03	574.000
Cresolsulfonic acid, formaldehyde condensate	15	34.830
m-Cresyl acetate	06	258.500
Cresyl diphenyl phosphate	11	9.000
Cresylic acid (Less than 75 percent distilling over 215° C)	02	12.000

Chemical name	Sect. Item	
	No.	No.
Cresylic acid, refined; from petroleum	03	580.000
Crotonaldehyde	15	786.000
Crotonic acid (2-Butenoic acid)	15	506.000
Crotononitrile	15	438.000
Crude acetate mixture (Linalyl, neryl, geranyl acetates, main components)	07	162.100
Crude caryophyllene mixture (α , β and γ isomers)	07	162.130
Crude coal tar	01	0.500
Crude coal tar solvent	01	22.030
Crude light oil	01	1.000
Crude tar acid oils having a tar acid content of: 5% to less than 24%	01	15.000
Cumene (Isopropyl benzene)	03	581.000
Cumene hydroperoxide	15	35.000
Cumenesulfonic acid, ammonium salt	12	144.000
Cumenesulfonic acid, sodium salt	12	144.100
Cumyl acetate	07	29.200
Cumyl alcohol	07	29.300
Cumyl formate	07	29.400
α -Cumyl peroxyneodecanoate	15	35.400
Cumyl phenolate isopropoxy titanium salt	12	776.500
Cyanoacetic acid (Malonic nitrile)	15	438.600
4-(Cyanoacetyl)morpholine	03	582.200
Cyanocobalamin (animal feed grade)	06	795.000
Cyanocobalamin (U.S.P. crystalline)	06	797.000
Cyanoethyl cellulose	03	582.500
1-(2-Cyanoethyl)ethyl urea	15	349.000
N-Cyano-s-methyl-N-2(4-methyl-5-imidazolyl)-methylthioethylisothiourea	03	584.213
Cyano-3-phenoxybenzyl-cis, trans-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropane carboxylate	13	166.049
Cyano(3-phenoxyphenyl)methyl-4-chloro- α -(1-methylethyl)benzeneacetate	13	166.024
Cyanuric acid	15	36.000
Cyclacillin	06	13.500
Cyclic chemicals, all other	15	218.000
Cyclic elastomers, all other	10	6.000
Cyclic fungicides, all other	13	40.000
Cyclic herbicides, all other	13	118.000
Cyclic insecticides, all other	13	166.000
Cyclic intermediates, all other	03	1554.000
Cyclic plasticizers, all other	11	58.000
Cyclizine hydrochloride	06	79.000
Cyclobenzaprine hydrochloride	06	477.500
Cyclohexadecen-7-olide	07	95.000
2,5-Cyclohexadiene-1,4-dione, dioxime	03	585.700
Cyclohexane	03	586.000

APPENDIX D

Table 4—Continued
Alphabetical chemical index

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<i>Chemical name</i>	<i>Sect. No.</i>	<i>Item No.</i>
1,2-Cyclohexanedicarboxylic acid anhydride	03	588.000
1,3-Cyclohexanedione	03	588.212
Cyclohexanesulfamic acid (Cyclamic acid)	07	82.000
Cyclohexanesulfamic acid, calcium salt (Calcium cyclamate)	07	83.000
Cyclohexanesulfamic acid, sodium salt (Sodium cyclamate)	07	84.000
Cyclohexanethiol	15	36.800
Cyclohexanol	03	589.000
Cyclohexanone	03	590.000
Cyclohexanone oxime	03	591.000
Cyclohexene	03	592.000
3-Cyclohexene-1-carboxaldehyde	03	592.100
4-Cyclohexene-1,2-dicarboxylic anhydride	03	594.000
2-Cyclohexene-1-octanoic acid, 5 (and 6)-carboxy-4-hexyl, C ₂₁ H ₃₈ O ₄	15	39.500
Cyclohexene oxide	03	594.100
β-(1-Cyclohexenyl)ethylamine	03	594.298
Cycloheximide	06	65.000
Cyclohexylamine	03	595.000
Cyclohexylamine	15	39.900
N-Cyclohexyl-2-benzothiazolesulfenamide	09	26.000
Cyclohexyl cyclohexanol	07	95.140
2-Cyclohexylcyclohexanone	07	95.150
3-Cyclohexyl-6-(dimethylamino)-1-methyl-1,3,5-triazine-2,4-(1H,3H)-dione	13	118.019
1,4-Cyclohexylenedimethanol	15	41.000
Cyclohexyl isooctyl phthalate	11	23.200
N-Cyclohexyl-N'-phenyl-p-phenylenediamine	09	58.000
Cyclohexyl salicylate	07	95.270
N-(Cyclohexylthio)phthalimide	09	124.250
Cyclo chloroacetate	15	41.800
Cyclooctadiene	03	597.800
Cyclopentane	02	11.000
Cyclopentanone	07	95.250
Cyclopentene	03	600.000
Cyclopropane	15	42.000
Cyclopropanecarbonyl chloride	03	601.750
Cyclopropanecarboxylic acid	03	601.760
Cyclopropane carboxylic acid chloride	15	42.100
α-Cyclopropyl-α-(p-methoxyphenyl)-5-pyrimidine methanol (Ancymidol)	13	168.140
2-Cyclopropylmethylamino-5-chlorobenzophenone	03	601.780
2-(N-Cyclopropylmethyl-N-phthalimidoacetyl)-amino-5-chlorobenzophenone	03	601.800
Cyclosoils	02	4.010
p-Cymene	03	602.000
Cypermethrin	13	166.029

<i>Chemical name</i>	<i>Sect. No.</i>	<i>Item No.</i>
Cyproheptadine hydrochloride	06	91.000
Cytarabine	06	278.300
Danazol	06	692.500
Decabromodiphenyl ether (DBDP)	15	43.005
Decahydronaphthalene (Decalin)	15	44.000
Decanal (Capraldehyde)	07	132.000
1-Decanamine, N,N-didodecyl	12	432.850
n-Decane	15	1337.000
1-Decanol	15	850.500
Decanoyl chloride	15	507.000
Decanoyl peroxide	15	1291.000
Decyl acetate	07	132.500
Decyl alcohol, ethoxylated	12	727.000
Decyl alcohol, ethoxylated and phosphated	12	76.200
Decyl alcohol, ethoxylated and phosphated, potassium salt	12	76.205
Decyl alcohol, ethoxylated and phosphated, potassium salt	12	76.203
Decyl alcohol, ethoxylated and polyphosphated	12	76.208
Decyl alcohol, ethoxylated and propoxylated	12	727.010
Decyl alcohol, potassium salt	12	76.210
Decylaldehyde dimethyl acetal	07	132.550
n-Decyl mercaptan	09	170.800
Decyl and octyl alcohols, ethoxylated	12	736.000
Decyl and octyl phosphate	12	92.000
Decyl and octyl sulfate, sodium salt	12	217.000
Decyl oleate	11	90.300
Decyloxypoly(ethyleneoxy)ethyl chloride	12	728.000
Decyl polyphosphate, sodium salt	12	95.000
Decyl sulfate, sodium salt	12	218.000
Dehydroacetic acid or sodium salt	15	45.000
Developmental alcohol, ethoxylated	12	736.500
Dexamethasone	06	654.000
Dexamethasone acetate	06	654.500
Dexamethasone sodium phosphate	06	655.000
Dexbrompheniramine maleate	06	92.000
Dexpanthenol	06	789.000
Dextran	06	637.000
Dextroamphetamine	06	514.000
Dextroamphetamine sulfate	06	517.000
Dextromethorphan hydrobromide	06	430.000
Dextrothyroxine, sodium	06	614.700
Diacenaphtho[1,2-;1',2'-]fluoranthene (Decacyclene)	03	604.100
3-Diacetoxyethylaminobenzanilide	03	605.600
Dialkylbenzene	03	608.200
Dialkyldithiocarbamic acid derivative	09	127.950
Di(C ₅ -C ₆ alkyl)naphthalenesulfonic acid	12	162.500

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 4—Continued
Alphabetical chemical index

Chemical name	Sect. Item	
	No.	No.
Diallyl isophthalate	08	4.030
Diallyl maleate	15	913.000
Di-amine derivatives of dimer acids	15	258.500
Diamines and polyamines, all other	12	417.000
1,5(and 1,8)-Diaminoanthraquinone	03	612.000
2,4-Diaminobenzenesulfonic acid [SO ₃ H=1]	03	616.000
1,3 Diaminocyclohexane	03	618.100
Diamino cyclohexane, mixed	15	45.830
1,5-Diamino-4,8-dihydroxyanthraquinone	03	626.000
4,4-Diaminodiphenyl ether	15	45.840
3,3-Diaminodiphenyl sulfone	15	45.850
4,4'-Diaminodiphenyl sulfone	03	629.100
2,6-Diaminopyridine	03	634.000
4,4'-Diamino-2,2'-stilbenedisulfonic acid	03	635.000
Diammonium dithiodiglycolate	15	627.400
di-t-Amyl acid phosphate	14	191.000
2,5-Dianilino-terephthalic acid	03	640.000
Diarylenediamines, mixed	09	59.000
Diarylide yellows, other	05	12.000
Diatrizeate, sodium	06	564.000
1,4-Diazobicyclo(2.2.2)octane	15	47.000
4-Diazo-2,5-diehoxymorpholinobenzene	14	336.000
Diazodinitrophenol	15	48.000
Diazoxide	06	355.500
2,5-Di(benzoyl peroxy)-2,5-dimethylhexane	15	49.000
Dibenzylamine	09	40.000
Dibenzylthiocarbamic acid, sodium salt	09	9.000
Dibenzylthiocarbamic acid, zinc salt	09	10.000
N,N'-Dibenzylethylenediamine diacetate	03	654.000
N,N-Dibenzylhydroxylamine	14	476.000
2,4-Dibromoacetophenone	03	656.000
m-Dibromobenzene	03	658.000
p-Dibromobenzene	03	659.000
1,2-Dibromo-2,2-dichloroethyl dimethyl phosphate (Naled)	13	217.000
1,2-Dibromo-2,4-dicyanobutane	13	195.012
Dibromodifluoromethane	15	1260.000
(1,2-Dibromoethyl)benzene	03	659.300
3,5-Dibromo-4-hydroxybenzonitrile (Bromoxynil)	13	118.031
Dibromomethane (methylene bromide)	15	1213.000
2,2-Dibromo-3-nitropropionamide	15	233.500
2,6-Dibromo-4-nitroaniline	03	660.100
2,4-Dibromo-6-nitro-m-cresyl methyl ether	07	29.750
2,6-Dibromophenol	03	661.800
2,3-Dibromopropanol	15	1296.700
Dibucaine	06	702.000
Dibucaine hydrochloride	06	703.000

Chemical name	Sect. Item	
	No.	No.
Dibutoxy acetophenone	15	50.500
p-Dibutoxybenzene (DBB)	03	665.100
Di(2-(2-butoxyethoxy)ethyl) adipate	11	59.000
Dibutoxyethyl adipate	11	59.200
Di(2-butoxyethyl) phthalate	11	24.000
2,5-Dibutoxy-4-morpholinobenzenediazonium sulfate salt (DBB Sulfate)	03	666.100
2,5-Dibutoxy-4-morpholinonitrobenzene	03	666.200
Di-n-butylamine	15	262.000
2-Dibutylaminoethanol	15	350.000
Dibutylaminomethanol	15	350.500
Dibutyl butylphosphonate	15	1022.000
2,6-Di-tert-butyl-p-cresol, (BHT), food grade	15	51.000
2,6-Di-tert-butyl-p-cresol, (BHT), technical grade	15	52.000
2,5-Di-sec-butyldecylhydroquinone	09	88.400
Di-t-butyl diperoxyphthalate	15	53.200
Dibutylidithiocarbamic acid, nickel salt	09	128.100
Dibutylidithiocarbamic acid, sodium salt	09	128.000
Dibutylidithiocarbamic acid, zinc salt	09	130.000
Di-tert-butylethyldiamine	15	267.800
Dibutyl fumarate	15	915.000
Dibutyl hydrogen phosphite	15	1023.000
2,5-Di-tert-butylhydroquinone	15	53.000
Di-n-butylmagnesium	15	1374.200
Dibutyl maleate	15	916.000
Dibutyl-naphthalenesulfonic acid	12	163.000
2,6-Di-tert-butyl-4-nonylphenol	03	666.500
Di(sec-butyl)peroxydicarbonate	15	917.000
2,4-Di-tert-butylphenol	03	667.000
2,6-Di-sec-butylphenol	03	860.040
2,6-Di-tert-butylphenol	03	860.050
2,6-Di-tert-4-sec-butylphenol	03	846.900
2,4-Di-t-butyl phenyl 3,5-di-t-butyl hydroxybenzoate	15	53.500
N,N'-Di-sec-butyl-p-phenylenediamine	14	180.000
Dibutyl phthalate (including diisobutyl phthalate)	11	25.000
Dibutyl pyrophosphate	15	1023.500
Dibutyl sebacate	11	112.000
1,3-Dibutyl-3-thiourea	15	351.000
Dibutyltin bis(butylmaleate)	15	1401.100
Dibutyltin bis(isooctylmercaptoacetate)	15	1401.200
Dibutyltin bis(mercaptolaurate)	15	1402.000
Dibutyltin dichloride	15	1402.500
Dibutyltin di-2-ethylhexanoate	15	635.000
Dibutyltin dilaurate	15	677.500
Dibutyltin maleate	15	687.000
Dibutyltin oxide	15	1404.000
Di-n-butylxantho disulfide	09	152.000

Table 4—Continued
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Chemical name	Sect. Item	
	No.	No.
N-(1,2-Dicarboxyethyl)-N-octadecylsulfosuccinamic acid, tetrasodium salt	12	177.000
Dicatechol borate, di-o-tolylguanidine salt	09	17.000
2,2-dichloroacetyl chloride	15	507.500
3,4-Dichloroaniline	03	670.000
3,6-Dichloro-2-anisic acid (Dicamba)	13	50.000
Dichlorobenzanthrone	03	675.100
o (and p)-Dichlorobenzene	03	678.000
o-Dichlorobenzene	03	677.000
m-Dichlorobenzene	03	676.000
p-Dichlorobenzene	03	679.000
3,3'-Dichlorobenzidine base and salts	03	682.000
2,6-Dichlorobenzonitrile	13	51.100
3,4-Dichlorobenzotrifluoride	03	683.150
3,5-Dichlorobenzoyl chloride	03	684.050
Dichlorobenzyl chloride	03	684.100
2,4-Dichlorobenzyl dimethyl (mixed alkyl) ammonium chloride	12	519.900
(3,4-Dichlorobenzyl) dodecyl dimethyl ammonium chloride	12	520.000
2,4-Dichloro-6-(o-chloroanilino)-s-triazine	13	3.000
2,2-Dichloro-1,1-difluoroethyl methyl ether	15	1308.000
Dichlorodifluoromethane (F-12)	15	1262.000
4,6-Dichloro-1,3-dihydroxybenzene	03	687.500
1,4-Dichloro-2,5-dimethoxybenzene (Chloroneb)	13	4.000
1,3-Dichloro-5,5-dimethylhydantoin	15	54.000
Dichlorodimethylsilane	15	1382.000
Dichlorodiphenylsilane	03	690.000
3,3'-Dichloro-4,4'-(2-hydroxy-3-anilido-1-naphthazo) biphenyl	03	691.250
2,6-Dichloro-3-methylaniline	03	694.050
2,5-Dichloro-4-(3-methyl-5-oxo-2-pyrazolin-1-yl) benzenesulfonic acid	03	695.000
Dichloromethylphenylsilane	03	696.000
Dichloromethylsilane	15	1383.000
Dichloromethylvinylsilane	15	1384.000
2,6-Dichloro-4-nitroaniline	03	697.000
1,2-Dichloro-4-nitrobenzene	03	698.000
2,4-Dichloro-5-nitrotrifluoromethylbenzene	03	699.900
Dichlorooctamethyl tetrasiloxane	15	1384.500
2,4-Dichlorophenoxyacetic acid (2,4-D)	13	86.000
2,4-Dichlorophenoxyacetic acid, butoxyethanol ester	13	86.500
2,4-Dichlorophenoxyacetic acid, n-butyl ester	13	89.000
2,4-Dichlorophenoxyacetic acid, sec-butyl ester	13	90.000
2,4-Dichlorophenoxyacetic acid, dimethylamine salt	13	91.000
2,4-Dichlorophenoxyacetic acid, esters and salts, all other	13	99.000
2,4-Dichlorophenoxyacetic acid, ethanolamine and isopropanolamine salts	13	92.000

Chemical name	Sect. Item	
	No.	No.
2,4-Dichlorophenoxyacetic acid, iso-octyl ester	13	95.000
2,4-Dichlorophenoxyacetic acid, isopropyl ester	13	96.000
2-(2,4-Dichlorophenoxy)propionic acid, dimethylamine salt	13	118.052
2-(2,4-Dichlorophenoxy)propionic acid, isooctyl ester	13	118.060
3-(3,4-Dichlorophenyl)-1,1-dimethylurea (Diuron)	13	53.000
O-(2,4-Dichlorophenyl) O-ethyl S-propyl phosphorodithioate	13	165.013
3-(3,4-Dichlorophenyl)-1-methoxy-1-methylurea (Linuron)	13	54.000
1-[-(2,4-Dichlorophenyl)4-propyl-1,3-dioxolan-2-ylmethyl]-1H-1,2,4-triazole	13	118.065
1,2-Dichloropropane (Propylene dichloride)	15	1235.000
1,3-Dichloropropene	13	238.000
2,3-Dichloropropene	15	1236.000
3',4'-Dichloropropionanilide (Propanil)	13	56.000
2,2-Dichloropropionic acid, sodium salt (Dalapon)	13	201.000
2,5-Dichlorosulfanilic acid [SO ₂ H=1]	03	706.000
Dichlorotetrafluoroethane	15	1263.000
p,α-Dichlorotoluene	03	708.000
4,4'-Dichloro-3-(trifluoromethyl)carbanilide	15	56.000
Dichlorophenamide	08	738.000
Dicloxacillin, sodium	06	14.000
Dicresylphosphorodithioic acid	14	130.000
Dicresylphosphorodithioic acid, ammonium salt	14	131.000
Dicumyl peroxide	15	56.500
Dicyandiamide resins	08	4.050
Dicyanodiamide formaldehyde ammonium chloride polymer	14	477.000
1,1-Dicyclohexane	15	56.950
Dicyclohexylamine	03	712.000
Dicyclohexylamine, nitrate salt	03	712.100
Dicyclohexyl phthalate	11	27.000
Dicyclopentadiene (includes Cyclopentadiene)	03	714.000
Dicyclopentadienylchromium	15	57.800
Didecyl dimethyl ammonium chloride	12	483.500
2,5-Di-(1,1-dimethylpropyl)hydroquinone	09	89.000
Diesel fuel additives, acyclic, all other	14	151.000
Diesel fuel additives, cyclic, all other	14	152.000
Diethanolamine	15	380.000
Diethanolamine condensate, all other	12	555.000
Diethanolamine condensates, amine/acid ratio=1/1, all other	12	553.000
Diethanolamine-stearic acid (amine acid ratio=1/2)	12	575.130
α,α-Diethoxyacetophenone	03	716.200
p-Diethoxybenzene	03	718.000
Diethoxyethane	15	1308.500
2,5-Diethoxy-4-morpholinobenzendiazonium chloride	14	338.000

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 4—Continued
Alphabetical chemical index

Chemical name	Sect. No.	Item No.
Diethoxyphenyl acetophenone	15	57.200
2-(Diethoxyphosphinylimino)-4-methyl-1,3-dithiolane	13	165.016
Diethoxyphosphorylethyltriethoxysilane	15	1385.000
Diethyl acetal	07	132.700
Diethylaluminum chloride	15	1356.000
Diethyl aluminum ethoxide	15	1356.200
Diethylaluminum iodide	15	1357.000
Diethylamine	15	277.000
p-Diethylaminobenzenediazonium chloride (p-Diazo-N,N-diethylaniline zinc chloride)	14	340.000
2-Diethylaminoethanol (N,N-Diethylethanolamine)	15	355.000
2-(2-Diethylaminoethoxy)ethanol	15	356.000
2-Diethylaminoethyl acrylate	15	357.000
Diethylaminoethylacrylate, dimethyl sulfate, quaternary salt	15	357.100
3'-[2-(Diethylamino)ethyl]-4'-hydroxyacetanilide	03	721.200
2-Diethylaminoethyl methacrylate	15	358.000
2[4-Diethylamino-2-hydroxybenzylbenzoic acid]	03	722.503
o-(2-(Diethylamino)-6-methyl (4-pyrimidinyl) o,o-dimethyl phosphorothioate	13	152.600
N,N-Diethylaniline	03	727.000
2,6-Diethylaniline	03	727.200
Diethylbenzene	03	729.000
Diethylcarbamazine citrate	06	118.000
Diethylcarbamoyl chloride	15	359.000
Diethyl carbonate (Ethyl carbonate)	15	922.000
Diethyl cyclohexylamine	15	57.430
N,N'-Diethyl-N,N'-diphenylurea	15	57.400
Diethyldithiocarbamic acid, cadmium salt and bis(diethylthiocarbamoyl)disulfide, mixture	09	132.000
Diethyldithiocarbamic acid, selenium salt	09	134.000
Diethyldithiocarbamic acid, sodium salt	09	135.000
Diethyldithiocarbamic acid, tellurium salt	09	136.000
Diethyldithiocarbamic acid, zinc salt	09	137.000
N,N-Diethyldodecanamide	15	235.000
Diethylene glycol	15	1153.000
Diethylene glycol adipate	15	1100.800
Diethylene glycol, borated	15	1101.000
Diethylene glycol dibenzoate	11	1.300
Diethylene glycol dimethacrylate	15	1103.000
Diethylene glycol dioleate	12	603.500
Diethylene glycol distearate	12	604.000
Diethylene glycol esters, all other	12	615.000
Diethylene glycol monoester of coconut oil acids	12	605.000
Diethylene glycol monoester of tall oil acids	12	605.800
Diethylene glycol monooleate	12	607.000
Diethylene glycol mono-oleate	12	608.000

Chemical name	Sect. No.	Item No.
Diethylene glycol monostearate	12	610.000
Diethylene glycol phthalate	11	27.500
Diethylene glycol sesquilester of tall oil acids	12	611.000
Diethylene glycol sesquileurate	12	612.000
Diethylene glycol succinate	11	125.500
Diethylene glycol terephthalate	12	614.200
Diethylenetriamine	15	269.800
Diethylenetriamine, ethoxylated and propoxylated	12	327.700
(Diethylenetriamine)pentamethylenephosphonic acid	14	31.000
(Diethylenetriamine)pentamethylenephosphonic acid, sodium salt	14	32.000
Diethylenetriamine, propoxylated	12	327.710
Diethylenetriamine, triethylphosphate, urea polymer, stearate	14	478.000
(Diethylenetrinitrilo)pentaacetic acid	14	33.000
(Diethylenetrinitrilo)pentaacetic acid, monosodium hydrogen ferric salt	14	34.000
(Diethylenetrinitrilo)pentaacetic acid, pentasodium salt	14	35.000
N,N-Diethyl-3-ethoxyaniline	03	730.050
O,O-Diethyl S-[2-(ethylthio)ethyl] phosphorodithioate (Disulfoton)	13	218.000
O,O-Diethyl O-[2-(ethylthio)ethyl] phosphorothioate (Demeton O)	13	219.000
O,O-Diethyl S-[(ethylthio)methyl] phosphorodithioate (Phorate)	13	221.000
Diethylglycol amine (DEGA)	15	359.700
Di(2-ethylhexyl) adipate	11	60.000
Di(2-ethylhexyl) azelate	11	67.000
Di(2-ethylhexyl)chloroendate	15	57.500
Di(2-ethylhexyl) isophthalate	11	33.950
Di(2-ethyl-1-hexyl) maleate	15	928.000
Di-(2-ethylhexyl) peroxydicarbonate	15	1292.000
Di(2-ethyl-1-hexyl) peroxydicarbonate	15	929.000
Di-2-ethylhexylphosphorodithioic acid	14	233.000
Di(2-ethylhexyl) phthalate	11	34.000
Di(2-ethylhexyl) sebacate	11	113.000
Diethyl hydrogen phosphite	15	1026.000
Diethylhydroxylamine	15	360.000
Diethyl isobutylidene malonate	07	132.850
Diethyl isophthalate	11	27.900
O,O-Diethyl O-(2-isopropyl-4-methyl-6-pyrimidinyl) phosphorothioate (Diazinon)	13	155.000
Diethyl maleate	15	930.000
N,N-Diethyl-4-methoxymetanilamide	03	732.000
O,O-Diethyl O-[4-(methylsulfinyl)phenyl]phosphorothioate	13	165.011
O,O-Diethyl O-(p-nitrophenyl)phosphorothioate (Parathion)	13	156.000

Table 4—Continued
Alphabetical chemical index

Chemical name	Sect. No.	Item No.
Diethyl oxalate (Ethyl oxalate)	15	934.000
N,N-Diethyl-p-phenylenediamine	03	738.000
o,o-Diethyl-o-phenyl phosphorothioate	15	1027.200
Diethyl phosphorothionic dichloride	15	1032.200
Diethyl phosphorochlorodithionate	15	1027.000
Diethyl phthalate	11	28.000
Diethylpropion hydrochloride	06	544.000
Diethyl sebaca/e	07	133.000
Diethyl succinate	07	134.000
Diethyl sulfide (Ethyl sulfide)	02	92.810
1,5-Diethyl-2-thio-4,6-pyrimidinedione	15	57.750
1,3-Diethyl-2-thiourea	15	361.000
N,N-Diethyltoluamide (DEET)	13	148.000
3,5-Diethyltoluene	03	827.700
N,N-Diethyl-m-toluidine	03	739.000
N,N-Diethyl-p-toluidine	03	739.500
O,O-Diethyl 0-3,5,6-trichloro-2-pyridyl phosphorothioate	13	156.100
3,9-Diethyl-6-tridecyl sulfate, sodium salt	12	242.000
Diethylzinc	15	1408.000
Diflorasone diacetate	06	655.400
Diflunisal	06	385.500
1,1-Difluoroethane	15	1264.000
Digoxin	06	378.300
Di-(n-heptyl-n-nonyl) undecyl phthalate	11	28.925
Di-n-hexyl adipate	11	60.600
Diethyl fumarate	07	134.020
Di-n-hexyl magnesium	15	1374.500
Dihydrocarvone	07	134.050
Dihydrocoumarin	07	29.780
Dihydro-cyclacet	07	95.280
6,11-Dihydrodibenz(b,e)oxepin-11-one	03	740.500
2,3-Dihydro-2,2-dimethyl-7-benzofuranyl	03	744.200
2,3-Dihydro-2,2-dimethyl-7-benzofuranol	03	744.100
2,3-Dihydro-2,2-dimethyl-7-benzofuranyl[(di)butylamino thio]methyl carbamate	13	148.300
2,3-Dihydro-2,2-dimethyl-7-benzofuranyl methylcarbamate	13	148.400
2,2-(2,3-Dihydro-1,3-dioxo-1H-inden-2-yl)-(quinolinyl)-6-methylbenzothiazole-7-sulfonic acid	03	752.600
1,2-Dihydro-6-ethoxy-2,2,4-trimethylquinoline (Ethoxyquin)	09	68.000
Dihydroxinalool	07	136.500
1,3-Dihydro-4(or 5)-methyl-2H-benzimidazole-2-thione	09	41.450
2,3-Dihydro-2-[6-methyl-7-sulfo-2-benzothiazolyl]-2-quinolinyl-1,3-dioxo-1H-indene-5-carboxylic acid	03	756.500
Dihydromyrcene	15	1137.500
Dihydro myrcenol	07	134.100
Dihydronordicyclopentadienyl acetate (Cyclacet)	07	95.330

Chemical name	Sect. No.	Item No.
Dihydronordicyclopentadienyl propionate (Cyclaprop) (Verdyl propionate extra)	07	95.470
Dihydro pentamethyl indanone	07	134.200
1,2-Dihydro-3,6-pyridazinedione (Maleic hydrazide) (MH)	13	168.300
Dihydrostreptomycin	06	6.000
Dihydro terpineol	07	95.490
Dihydroterpinyl acetate	07	95.510
Dihydroterpinyl acetate	07	166.367
1,2-Dihydro-2,2,4,7-tetramethylquinoline	03	761.700
2,5-Dihydrothiophene-1,1-dioxide (Sulfolene)	15	58.000
1,2-Dihydro-2,2,4-trimethylquinoline	09	69.000
Dihydroxyaluminum aminoacetate	06	620.000
1,4-Dihydroxyanthraquinone	03	764.000
2,6-Dihydroxyanthraquinone	03	768.000
2,4-Dihydroxybenzaldehyde	03	768.200
2,5-Dihydroxy-p-benzenedisulfonic acid, dipotassium salt	03	769.200
3,4-Dihydroxybenzoic acid, methyl ester	03	768.500
2,4-Dihydroxybenzophenone	03	769.100
Di(hydroxy)bis(ammoniumlactato)titanium	15	1059.500
Dihydroxydimethyl benzophenone	15	59.100
3,5-Dihydroxy-3,5-dimethyl-1,2-peroxycyclopentane	15	60.000
1,5-Dihydroxy-4,8-dinitroanthraquinone	03	770.000
1,8-Dihydroxy-4,5-dinitroanthraquinone	03	771.000
N,N-di(hydroxyethyl)-n-carboxymethyl tallow ammonium quat, inner salt	12	10.320
N,N-Di(β-hydroxyethyl)-m-chloroaniline	03	771.300
N,N-Dihydroxyethylglycine, sodium salt	14	39.000
3,5-Dihydroxy-N-(2-hydroxyethyl)benzamide	03	771.503
Dilodomethane (Methylene iodide)	15	1277.000
Dilodomethyl-p-tolyl sulphone	15	63.000
Diisobutyl adipate	11	61.000
Diisobutyl alcohol	15	850.700
Diisobutylaluminum chloride	15	1358.000
Diisobutylaluminum hydride	15	1359.000
Diisobutylamine	15	263.000
Di-isobutylene (DI-isobutene)	02	74.000
Di-isobutylene maleate	12	707.000
Diisobutylene polysulfide	14	256.000
Diisodecyl adipate	11	62.000
Diisodecyl phthalate	11	30.000
Diisohexyl phthalate	11	30.050
Dilisononyl adipate	11	62.500
Dilisononyl phthalate	11	30.100
Diiso-octyl adipate	11	63.000
Diiso-octyl azelate	11	69.000
Diiso-octyl phthalate	11	35.000

Table 4—Continued
Alphabetical chemical index

Chemical name	Sect. Item	
	No.	No.
Di-Isopropane (2,3-Dimethylbutane)	02	64.000
Dilsopropyl adipate	11	63.200
Dilsopropylamine	15	286.000
Dilsopropylamine	15	408.000
2-Dilsopropylaminoethanol (N,N-Dilsopropylethanolamine)	15	362.000
Dilsopropylaniline	03	778.000
Dilsopropylbenzene	03	778.100
Dilsopropylbenzene hydroperoxide	15	64.000
Dilsopropyl carbodiimide	15	364.100
Dilsopropyl ketone (2,4-Dimethyl-3-pentanone)	15	817.000
Dilsopropyl naphthalenesulfonic acid, sodium salt	12	166.000
Dilsopropyl peroxydicarbonate (Isopropyl percarbonate)	15	1293.600
N,N'-Dilsopropyl-p-phenylenediamine	14	181.000
S-(O,O-Dilsopropyl phosphorodithioate) ester of N-(α -mercaptoethyl)benzenesulfonamide (Bensulide)	13	58.000
Dilsopropyl sebacate	11	114.100
Dilsopropyltitanate bis(ethyl-3-oxobutanoate)	15	1059.450
Diketene	15	66.000
Dilauryldimethylammonium chloride	12	484.300
Dilauryl-3,3'-thiodipropionate	15	940.000
Dimenhydrinate	06	80.000
Dimer acid (C ₂₈ Aliphatic dibasic acid)	15	509.000
Dimeracidalkyl amine	12	419.300
N-(Dimeracidalkyl)trimethylenediamine	12	407.700
Dimer acid esters and polyesters	14	273.000
2,5-Dimercapto-1,3,4-thiadiazole	09	27.800
Dimer diamine	12	407.710
Dimethindene maleate	06	94.000
2,5-Dimethoxyaniline, ethoxylated	12	342.250
m-Dimethoxybenzene	03	784.000
p-Dimethoxybenzene (Dimethyl ether of hydroquinone)	15	67.000
Dimethoxyethane (Ethylene glycol dimethyl ether)	15	1155.000
Di(2-methoxyethyl) phthalate	11	31.000
1,1-Dimethoxy octane	07	129.690
3-(Dimethoxyphosphinyloxy)-N,N-dimethyl-cis-crotonamide	13	222.000
1,2-Dimethoxy-4-propenylbenzene (4-Propenylveratrole)	07	30.000
2,5-Dimethoxytetrahydrofuran	03	794.300
3,4-Dimethoxytoluene	03	794.400
N,N-Dimethylacetamide	15	236.000
N,N-Dimethylacetoacetamide	15	236.500
O,S-Dimethylacetylphosphoramidothioate (Acephate)	13	222.500
Dimethyl adipate	11	63.225
N,N-Dimethyl-N-alkylamine phosphate	12	393.200
Dimethyl-alpha-lonone	07	102.100
Dimethylamine	15	288.000
Dimethylamine epichlorohydrin copolymer	15	364.750

Chemical name	Sect. Item	
	No.	No.
Dimethylamine epichlorohydrin ethylenediamine copolymer	14	417.000
p-(Dimethylamino)benzaldehyde	03	795.250
p-Dimethylaminobenzediazonium chloride (p-Diazo-N,N dimethylaniline zinc chloride)	14	346.000
m-(Dimethylamino)benzoic acid	03	796.000
2-[4-(Dimethylamino)benzoyl]benzoic acid	03	796.500
2-Dimethylaminoethanethiol hydrochloride	15	365.000
2-Dimethylaminoethanol (N,N-Dimethylethanolamine)	15	366.000
Dimethylaminoethylacrylate, methyl chloride, quaternary salt	15	367.900
Dimethylaminoethyl methacrylate	15	368.000
Dimethylaminoethylmethacrylate, dimethyl sulfate, quaternary salt	15	368.200
Dimethylaminoethylmethacrylate, methyl chloride, quaternary salt	15	369.000
Dimethylaminomethanol	15	369.500
2-Dimethylamino-2-methyl-1-propanol hydrochloride	15	369.600
1-(Dimethylamino)-2-propanol	15	369.700
Dimethylaminopropylamine	15	274.000
Dimethylaminopropylamine, propoxylated	15	369.900
11-[3(Dimethylamino)propyl]-6H-hydroxydibenz(b,e)oxepin	03	803.000
Dimethylaminopropyl methacrylamide	15	236.780
4-Dimethylaminopyridine	03	803.500
Dimethylammonium hydrogen isophthalate	09	41.725
N,N-Dimethylaniline	03	805.000
Dimethylarsinic acid (Cacodylic acid)	13	201.200
N,N-Dimethyl(behenyl alkyl)amine	12	432.200
N,N-Dimethylbemylarachidyl amine	12	432.970
2,2-Dimethyl-1,3-benzodioxol-4-yl N-methylcarbamate	13	166.027
N,N-Dimethylbenzylamine	03	809.000
1,1'-Dimethyl-4,4'-bipyridinium dichloride	13	118.049
2,5-Dimethyl-2,5-bis(2-ethyl-1-hexanoyl peroxy) hexane	15	1294.000
2,2-Dimethylbutanol (isohexyl alcohol)	15	851.700
3,3-Dimethylbutene	15	1337.400
N,N-Dimethylbutylamine	15	274.995
N-(1,3-Dimethylbutyl)-N'-phenyl-p-phenylenediamine	09	59.310
Dimethyl caprylamide capramide	15	236.800
Dimethyl carbonate	15	941.000
N,N-Dimethyl(coconut oil alkyl)amine	12	433.000
Dimethyl-1,4-cyclohexanedicarboxylate	03	811.500
Dimethyl cyclohexane methanol	07	95.580
γ ,4-Dimethyl-3-cyclohexene-1-propanol	07	30.500
N,N-Dimethylcyclohexylamine	03	813.000
Dimethylid(C12-18)ammonium chloride (mixed straight and branched chains)	12	485.780
Dimethyl diarachidyl behenylammonium chloride	12	485.870
2,5-Dimethyl-2,5-di(tert-butylperoxy)hexane	15	1295.000

Table 4--Continued
Alphabetical chemical index

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Chemical name	Sect. No.	Item No.
2,5-Dimethyl-2,5-di(tert-butylperoxy)hexyne-3	15	1296.000
O,O-Dimethyl-O-2,2-dichlorovinyl phosphate (DDVP)	13	223.000
Dimethyldioctadecylammonium chloride	12	486.000
Dimethyldioctadecylammonium methyl sulfate	12	487.000
N,N-Dimethyl-2,2-diphenylacetamide (Diphenamid)	13	59.000
N,N'-Dimethyl-N,N'-diphenylurea	15	67.800
Dimethyldithiocarbamic acid, bismuth salt	09	138.000
Dimethyldithiocarbamic acid, copper salt	09	139.000
Dimethyldithiocarbamic acid, lead salt	09	140.000
Dimethyldithiocarbamic acid, potassium salt	13	181.100
Dimethyldithiocarbamic acid, potassium salt	09	174.000
Dimethyldithiocarbamic acid, selenium salt	09	141.000
Dimethyldithiocarbamic acid, sodium salt	09	175.000
Dimethyldithiocarbamic acid, sodium salt and sodium polysulfide	09	142.000
Dimethyldithiocarbamic acid, zinc salt	09	143.000
N,N-Dimethyldodecylamine	12	434.000
N,N-Dimethyldodecylamine oxide	12	327.910
Dimethyl dodecyl ethyl ammonium ether sulfate	12	456.500
Dimethylethanolamine-stearic acid (amine acid ratio=1/1)	12	575.150
S-[[[(1,1-Dimethylethyl)thio]methyl] O,O-diethyl phosphorodithioate (Turbufos)	13	223.500
N,N-Dimethylformamide	15	237.000
N,N-Dimethylglycine	14	5.000
N,N-Dimethylglycine hydrochloride	14	6.000
2,6-Dimethylheptan-2-ol	07	95.610
2,6-Dimethyl-5-hepten-1-ol	07	134.500
N,N-Dimethylhexadecylamine	12	435.000
N,N-Dimethylhexadecylamine oxide	12	328.000
Dimethyl hexanediol	07	134.600
2,5-Dimethyl-3-hexyne-2,5-diol	07	134.650
5,5-Dimethylhydantoin	03	816.000
1,1-Dimethylhydrazine	15	373.000
N,N-Dimethyl(hydrogenated tallow alkyl)amine	12	436.000
Dimethyl hydrogen phosphite	15	1028.000
Dimethyl isophthalate	11	31.500
Dimethyl isopropanolamine	15	408.100
Dimethyl maleate	15	943.000
2,2-Dimethyl-3-(2-methyl-5-isopropenyl cyclopent-1-enyl)-prop-1-yl propionate	07	95.630
Dimethyl methylphosphonate	15	1029.000
O,O-Dimethyl O-[4-(methylthio)-m-tolyl]phosphorothioate (Fenthion)	13	157.000
N,N-Dimethyl(mixed alkyl)amine	12	437.000
N,N-Dimethyl(mixed alkyl)amine oxide	12	328.100
2,5-Dimethyl-4(2)-morpholinylmethylphenol, hydrochloride	03	819.600
Dimethyl-2,6-naphthalenedicarboxylate	03	819.500

Chemical name	Sect. No.	Item No.
0,0-Dimethyl 0-(p-nitrophenyl)phosphorothioate (Methyl parathion)	13	158.000
N,N-Dimethyl(9-octadecenyl-alkyl)amine	12	437.500
N,N-Dimethyloctadecenylamine	12	433.450
N,N-Dimethyl-9-octadecenylamine	12	438.200
N,N-Dimethyloctadecylamine	12	438.000
3,7-Dimethyl-trans-2,6-octadienal (Citral A;geranial)	07	134.850
3,7-Dimethyl-2,6-octadienal (Citral a&b)	07	134.900
3,7-Dimethyl-2,6-octadienenitrile	07	140.350
3,7-Dimethyl-cis-2,6-octadien-1-ol (Nerol)	07	135.000
3,7-Dimethyl-trans-2,6-octadien-1-ol (Geraniol)	07	138.000
3,7-Dimethyl-1,6-octadien-3-ol (Linalool) (Linalyl alcohol)	07	136.000
3,7-Dimethyl-cis-2,6-octadienol, acetate (Neryl acetate)	07	135.100
3,7-Dimethyl-1,6-octadien-3-ol,acetate (Linalyl acetate)	07	137.000
3,7-Dimethyl-1,6-octadien-3-yl formate	07	30.900
3,7-Dimethyl-1,6-octadien-3-yl isobutyrate (Linalyl isobutyrate)	07	139.000
3,7-Dimethyl-2,6-octadienyl phenylacetate (Geranyl phenylacetate)	07	31.000
3,7-Dimethyl-1,6-octadien-3-yl propionate (Linalyl propionate)	07	140.000
Dimethyloctanal	07	140.100
3,7-Dimethyloctanol-1 (Tetrahydrogeraniol)	07	140.450
3,7-Dimethyl-3-octanol	07	140.500
Dimethyloctanyl acetate	07	140.600
3,7-Dimethyl-6-octen-1-ol (Citronellal)	07	141.000
3,7-Dimethyl-6-octenenitrile	07	141.030
3,7-Dimethyl-6-octen-1-ol (Citronellol)	07	142.000
3,7-Dimethyl-7-octenol 70%, 6-octenol isomer 30%	07	142.100
Dimethyldihydroxyethylene urea	14	479.000
N,N-Dimethyl oleyl amine oxide	12	328.400
Dimethyl oleylammonium ethanoate	12	10.336
4,4-Dimethyl oxazolidene	15	67.900
4,4-Dimethyl oxazolone	15	68.200
O,O-Dimethyl S-[(4-oxo-1,2,3-benzotriazin-3(3H)-yl)methyl]phosphorodithioate (Azinphos-methyl)	13	159.000
α,α -Dimethylphenethyl acetate	07	32.000
Dimethyl phenylethyl carbinol	07	33.300
Dimethyl phosphate of 3-hydroxy-N-methyl-cis-crotonamide	13	225.000
O,S-Dimethyl phosphoramidothioate	13	229.012
Dimethyl phosphoridothionate	15	1030.000
Dimethyl phthalate	11	32.000
Dimethyl piperazine	15	68.250
1,1-Dimethylpiperidinium chloride	13	168.350
N,N-Dimethyl-1,3-propanediamine polymer with epichlorohydrin, sulfate	14	160.000

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 4—Continued
Alphabetical chemical index

Chemical name	Sect. No.	Item No.
2,2-Dimethyl-1,3-propanediol (Neopentyl glycol)	15	1080.000
Dimethylpropionic acid	15	510.000
N-(1,1-Dimethyl-2-propynyl)-3,5-dichlorobenzamide (Pronamide)	13	118.023
Dimethyl sebacate	11	114.900
Dimethyl(soya alkyl)ammonium ethyl sulfate	12	487.125
N,N-Dimethyl(soybean oil alkyl)amine	12	439.000
Dimethyl succinate	07	142.700
Dimethyl sulfide	02	92.820
Dimethyl sulfone	15	1309.150
N,N-Dimethyl(tallow alkyl)amine	12	439.500
Dimethyl-2,3,5,6-tetrachloroterephthalate (DCPA)	13	62.000
N,N-Dimethyltetradecylamine	12	440.000
Dimethyltetradecylamine oxide	12	328.130
N-[5-(1,1-Dimethyl)-1,3,4-thiadiazol-2-yl]-N,N-dimethylurea (Tebuthiuron)	13	118.061
Dimethyltin dichloride	15	1404.200
Dimethyltin-IOTG	15	1404.210
N,N-Dimethyl-o-toluidine	03	827.800
N,N-Dimethyl-p-toluidine	03	828.000
N-[2,4-dimethyl-5-[[trifluoromethyl]sulfonyl]amino]phenyl]acetamide, diethanolamine salt	13	168.375
Dimorpholine diethyl ether	15	68.279
Dimydrinolalyl acetate	07	136.700
Dimyristyl-3,3'-thiodipropionate	15	946.000
N,N'-Di-2-naphthyl-p-phenylenediamine	09	61.000
Dinitolmide	06	171.000
1,5 (and 1,8)-Dinitroanthraquinone	03	831.000
m-Dinitrobenzene	03	834.000
Dinitrobenzene-nitrobenzene mixture (30/70)	03	834.500
2,4-Dinitrobenzenesulfonic acid, sodium salt	03	835.100
3,5-Dinitrobenzoyl chloride	03	837.000
Dinitrobutylphenol (DNBP)	13	63.000
Dinitrobutylphenol, ammonium salt	13	64.000
Dinitrobutylphenol, triethanolamine salt	13	65.000
4,4-Dinitrocarbanilide-4,6-dimethyl-2-pyrimidinol	15	69.000
3,5-Dinitrochlorobenzenesulfonic acid, potassium salt	03	838.500
2,6-Dinitro-N,N-dipropyl cumidine	13	118.038
3,5-Dinitro-N;N-dipropylsulfanilamide	13	118.032
2,4-Dinitrophenol, tech.	03	840.000
2,4-Dinitrophenoxyethanol	03	840.500
3,5-Dinitrosalicylic acid, methyl ester	03	842.200
p-Dinitrosobenzene	03	842.800
Dinitrosopentamethylenetetramine	09	108.000

Chemical name	Sect. No.	Item No.
4,4'-Dinitrostilbene-2,2'-disulfonic acid	03	843.000
2,4-Dinitrotoluene	03	844.000
2,4 (and 2,6)-Dinitrotoluene	03	845.000
3,5-Dinitro-o-toluic acid	03	846.200
Dinonylhydroxybenzenesulfonic acid	03	846.400
Dinonylphenol	03	846.700
Dinonylphenol, ethoxylated	12	743.000
Dinonylphenol, ethoxylated and phosphated	12	76.300
Dinonylphenol ethoxylated and phosphated, barium salt	12	76.320
Dinonyl phthalate	11	33.000
Dinoprostone	06	679.200
Di-n-octadecyl-3,5-di-tert-butyl-4-hydroxyphenyl phosphonate	15	70.000
N,N'-Dioctadecyl-N,N'-diisopropyl thuram disulfide	09	150.200
Di-n-octyl adipate	11	63.300
Di-n-octylaluminum iodide	15	1359.500
N,N-Dioctyl-N,N-dimethyl ammonium chloride	12	487.150
Diocetyl maleate	15	947.000
Di-n-octyl phthalate	11	36.000
Diocetyl phthalates, all other	11	37.000
Dioleic acid (Ratio = 1/2)	12	555.100
Dioleil hydrogen phosphite	15	1031.000
Dioxane (1,4-Diethylene oxide)	15	72.000
2,3-p-Dioxanedithiol S,S-bis-(O,O-diethyl phosphorodithioate (Dioxathion))	13	162.000
1,3-Dioxolane	15	73.000
Di-para-benzoquinone dioxime	03	847.100
Di-para-xylene	15	74.066
Di-N,N'-pentamethylenethiuram tetrasulfide	09	42.000
Dipentylamine	15	295.000
2,4-Di-tert-pentylphenol	03	847.000
Diperoxydodecanediolic acid	15	1296.200
Diphenhydramine citrate	06	115.002
Diphenhydramine hydrochloride	06	95.000
1,5-Diphenoxyanthraquinone	03	848.000
Diphenoxylate	06	620.300
2-Diphenylacetyl-1,3-indandione and sodium salt	13	171.010
Diphenylamine	03	853.000
Diphenylamine-acetone aldehyde	09	52.700
Diphenylamine-acetone condensate	09	53.000
p-Diphenylaminediazonium sulfate	14	350.000
Diphenylcarbonyl chloride	03	855.100
Diphenyldimethoxysilane	03	855.500
Diphenyl-4,4'-diphenylmethylenedicarbamate	09	124.350
Diphenyldisulfide	03	855.250
Diphenyl-2-ethylhexyl phosphite	15	73.250
Diphenylsodocyl phosphite	15	73.300

Table 4—Continued
Alphabetical chemical index

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Chemical name	Sect. Item	
	No.	No.
Diphenylsocioctyl phosphite	15	73.340
Diphenylmercuric dodecenyil succinate	13	7.500
Diphenylmethane	03	856.100
Diphenylmethane-4,4'-diisocyanate (MDI)	03	1020.000
Diphenyloxidesulfonic acid-formaldehyde condensate	12	205.800
N,N'-Diphenyl-p-phenylenediamine	09	62.000
Diphenyl phthalate	03	857.400
Diphenylsulfone sulfonic acid, potassium salt	12	210.700
1,3-Di-4-piperidylpropane	03	858.313
Dipolyetherdisulfonic acid, diethanolamine salt	12	205.910
Dipropandiol dibenzoate (Dipropylene glycol dibenzoate)	11	4.000
Di-n-propyl adipate	11	63.350
Di-n-propylaluminum chloride	15	1359.400
Dipropylamine	15	300.000
Dipropylene glycol	15	1156.000
Dipropylene glycol monomethyl ether	15	1156.500
Dipropylene glycol salicylate	15	74.000
Di-n-propylsocioincheronate	13	148.500
Di-n-propyl peroxydicarbonate	15	1296.300
Di-N-propylphosphorodithioic acid	14	234.000
Di(pyrrolidonylethyl)imine	12	328.435
Direct Black 4	04	608.000
Direct Black 19	04	612.000
Direct Black 22	04	613.000
Direct Black 80	04	623.000
Direct Black 91	04	623.091
Direct Black 165	04	623.165
Direct Black 170	04	623.170
Direct Black 190	04	623.190
Direct black dyes, all other	04	625.000
Direct Blue 1	04	534.000
Direct Blue 2	04	535.000
Direct Blue 8	04	537.000
Direct Blue 15	04	539.000
Direct Blue 25	04	542.000
Direct Blue 67	04	544.000
Direct Blue 71	04	545.000
Direct Blue 75	04	547.000
Direct Blue 76	04	548.000
Direct Blue 79	04	549.079
Direct Blue 80	04	550.000
Direct Blue 86	04	552.000
Direct Blue 98	04	555.000
Direct Blue 100	04	556.000
Direct Blue 108	04	557.108
Direct Blue 120, 120:1, 120:2, and 120:3	04	558.000
Direct Blue 160	04	564.000

Chemical name	Sect. Item	
	No.	No.
Direct Blue 189	04	565.000
Direct Blue 191	04	566.000
Direct Blue 199	04	567.000
Direct Blue 218	04	568.000
Direct Blue 261	04	569.261
Direct Blue 269	04	570.269
Direct Blue 279	04	570.279
Direct Blue 280	04	570.280
Direct Blue 281	04	570.281
Direct Blue 283	04	570.283
Direct Blue 285	04	570.285
Direct Blue 286	04	570.286
Direct blue dyes, all other	04	571.000
Direct Brown 2	04	590.000
Direct Brown 31	04	593.000
Direct Brown 44	04	597.000
Direct Brown 154	04	605.000
Direct Brown 230	04	606.230
Direct Brown 231	04	606.231
Direct Brown 232	04	606.232
Direct Brown 238	04	606.238
Direct brown dyes, all other	04	607.000
Direct Green 92	04	586.092
Direct green dyes, all other	04	587.000
Direct Orange 6	04	457.000
Direct Orange 15	04	461.000
Direct Orange 26	04	462.000
Direct Orange 29	04	463.000
Direct Orange 34	04	464.000
Direct Orange 39	04	466.000
Direct Orange 72	04	470.000
Direct Orange 80	04	475.000
Direct Orange 102	04	479.000
Direct Orange 118	04	479.118
Direct orange dyes, all other	04	480.000
Direct Red 2	04	482.000
Direct Red 4	04	483.000
Direct Red 9	04	483.009
Direct Red 16	04	488.000
Direct Red 24	04	491.000
Direct Red 26	04	492.000
Direct Red 28	04	493.000
Direct Red 31	04	494.000
Direct Red 72	04	499.000
Direct Red 73	04	500.000
Direct Red 79	04	503.000
Direct Red 80	04	504.000

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 4—Continued
Alphabetical chemical index

<i>Chemical name</i>	<i>Sect. No.</i>	<i>Item No.</i>
Direct Red 81	04	505.000
Direct Red 83	04	506.000
Direct Red 149	04	517.000
Direct Red 153	04	519.000
Direct Red 236	04	521.236
Direct Red 238	04	521.238
Direct Red 239	04	521.239
Direct Red 254	04	521.254
Direct red dyes, all other	04	522.000
Direct Violet 9	04	525.000
Direct Violet 66	04	531.000
Direct Violet 99	04	532.099
Direct Yellow 4	04	421.000
Direct Yellow 5	04	422.000
Direct Yellow 6	04	423.000
Direct Yellow 11	04	427.000
Direct Yellow 28	04	433.000
Direct Yellow 34	04	435.000
Direct Yellow 44	04	438.000
Direct Yellow 50	04	439.000
Direct Yellow 51	04	439.051
Direct Yellow 105	04	445.000
Direct Yellow 106	04	446.000
Direct Yellow 107	04	447.000
Direct Yellow 118	04	450.000
Direct Yellow 119	04	451.000
Direct Yellow 127	04	453.000
Direct Yellow 131	04	454.000
Direct Yellow 132	04	454.132
Direct Yellow 133	04	454.133
Direct Yellow 137	04	454.137
Direct Yellow 147	04	454.147
Direct Yellow 148	04	454.148
Direct Yellow 150	04	454.150
Direct Yellow 152	04	454.152
Direct yellow dyes, all other	04	455.000
N,N'-Disalicylidene-1,2-propanediamine	14	161.000
Disodium cyanodithioimidocarbonate	13	179.000
Disopyramide phosphate	06	378.500
Disperse Black 1	04	749.000
Disperse Black 9	04	751.000
Disperse Black 33	04	752.000
Disperse black dyes, all other	04	753.000
Disperse Blue 3	04	716.000
Disperse Blue 27	04	719.000
Disperse Blue 56	04	722.000
Disperse Blue 60	04	723.000

<i>Chemical name</i>	<i>Sect. No.</i>	<i>Item No.</i>
Disperse Blue 62	04	725.000
Disperse Blue 64	04	727.000
Disperse Blue 72	04	728.072
Disperse Blue 73	04	729.000
Disperse Blue 77	04	730.000
Disperse Blue 79	04	731.000
Disperse Blue 81	04	732.000
Disperse Blue 95	04	734.000
Disperse Blue 102	04	735.000
Disperse Blue 118	04	739.000
Disperse Blue 122	04	739.122
Disperse Blue 148	04	742.148
Disperse Blue 165	04	743.165
Disperse Blue 200	04	743.200
Disperse Blue 281	04	743.281
Disperse Blue 284	04	743.284
Disperse Blue 291	04	743.291
Disperse Blue 337	04	743.337
Disperse Blue 338	04	743.338
Disperse blue dyes, all other	04	744.000
Disperse Brown 1	04	746.000
Disperse Brown 2	04	747.000
Disperse Brown 18	04	747.018
Disperse Brown 22	04	747.022
Disperse brown dyes, all other	04	748.000
Disperse Green 9	04	745.009
Disperse green dyes, all other	04	745.999
Disperse Orange 3	04	653.000
Disperse Orange 5	04	654.000
Disperse Orange 17	04	656.000
Disperse Orange 25 and 25:1	04	658.000
Disperse Orange 29	04	659.000
Disperse Orange 30	04	660.000
Disperse Orange 37	04	661.000
Disperse Orange 41	04	662.000
Disperse Orange 44 and 44:1	04	663.000
Disperse Orange 73	04	667.073
Disperse Orange 88	04	668.088
Disperse Orange 89	04	668.089
Disperse Orange 94	04	668.094
Disperse Orange 129	04	668.129
Disperse Orange 136	04	668.136
Disperse Orange 138	04	668.138
Disperse Orange 145	04	668.145
Disperse orange dyes, all other	04	669.000
(Disperse Red 214)	05	84.914
Disperse Red 1	04	670.000

Table 4—Continued
Alphabetical chemical index

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Chemical name	Sect. No.	Item No.
Disperse Red 5	04	672.000
Disperse Red 13	04	676.000
Disperse Red 15	04	677.000
Disperse Red 17	04	678.000
Disperse Red 22	04	679.022
Disperse Red 30	04	680.000
Disperse Red 35	04	682.000
Disperse Red 40	04	682.040
Disperse Red 50	04	683.000
Disperse Red 55	04	684.000
Disperse Red 60	04	686.000
Disperse Red 65	04	687.000
Disperse Red 73	04	688.000
Disperse Red 74	04	688.074
Disperse Red 82	04	689.000
Disperse Red 88	04	691.000
Disperse Red 91	04	692.091
Disperse Red 117	04	694.000
Disperse Red 128	04	694.128
Disperse Red 133	04	695.000
Disperse Red 135	04	695.135
Disperse Red 136	04	696.000
Disperse Red 137	04	697.000
Disperse Red 153	04	699.153
Disperse Red 159	04	700.000
Disperse Red 167 and 167:1	04	700.167
Disperse Red 177	04	701.000
Disperse Red 179	04	702.000
Disperse Red 195	04	703.195
Disperse Red 207	04	703.207
Disperse Red 263	04	703.263
Disperse Red 274	04	703.274
Disperse Red 278	04	703.278
Disperse Red 305	04	703.305
Disperse Red 307	04	703.307
Disperse Red 309	04	703.309
Disperse Red 311	04	703.311
Disperse Red 313	04	703.313
Disperse Red 316	04	703.316
Disperse Red 319	04	703.319
Disperse Red 325	04	703.325
Disperse Red 333	04	703.333
Disperse Red 338	04	703.338
Disperse Red 339	04	703.339
Disperse Red 340	04	703.340
Disperse Red 345	04	703.345
Disperse Red 364	04	703.364

Chemical name	Sect. No.	Item No.
Disperse red dyes, all other	04	704.000
Disperse Violet 1	04	705.000
Disperse Violet 28	04	710.000
Disperse Violet 33	04	710.033
Disperse Violet 36	04	710.036
Disperse Violet 60	04	713.060
Disperse violet dyes, all other	04	714.000
Disperse Yellow 3	04	628.000
Disperse Yellow 23	04	631.000
Disperse Yellow 34	04	635.000
Disperse Yellow 42	04	636.000
Disperse Yellow 54	04	638.000
Disperse Yellow 64	04	639.064
Disperse Yellow 67	04	640.000
Disperse Yellow 77	04	642.000
Disperse Yellow 86	04	644.000
Disperse Yellow 88	04	646.000
Disperse Yellow 108	04	650.108
Disperse Yellow 125	04	651.000
Disperse Yellow 126	04	651.126
Disperse Yellow 198	04	651.198
Disperse Yellow 200	04	651.200
Disperse Yellow 210	04	651.210
Disperse Yellow 219	04	651.219
Disperse yellow dyes, all other	04	652.000
Distearyldimethyl ammonium methosulfate	12	456.550
Distearyl maleate	15	948.000
Distearyl-3,3'-thiodipropionate	15	949.000
Distinnaxane, hexakis(2-methyl-2-phenylpropyl)	13	166.011
Distyrenated phenol, ethoxylated	12	76.500
Disulfuram	06	832.000
N,N'-(DI-tall oil acid)amidoethylamine	12	385.500
Ditallowamidoammonium sulfate	12	487.500
DI-tertiary nonylpolysulfide	14	257.000
2',2'-Dithiobis(benzanilide)	09	115.000
2,2'-Dithiobis[benzothiazole]	09	29.000
Dithiobis(stearyl propionate)	15	950.000
2,5-Dithiobiurea	15	376.000
Dithiocarbamic acid derivatives, acyclic, other	09	144.000
Dithiodiglycolic acid	15	513.080
4,4'-Dithiodimorpholine	09	43.000
Dithiodipropionic acid	15	513.100
1,4-DI-p-toluidinoanthraquinone	03	862.000
DI-tridecyl adipate	11	63.400
DItridecyl maleate	15	951.000
DI-tridecyl phthalate	11	39.000
DI(tridecyl)-3,3'-thiodipropionate	15	952.000

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 4—Continued
Alphabetical chemical index

Chemical name	Sect. Item	
	No.	No.
Diundecyl phthalate	11	39.300
1,5-diureidonaphthalene	03	865.800
Divinylbenzene	03	866.000
Divinyl tetramethyldisloxane	15	1385.500
Dobutamine hydrochloride	06	326.300
Docosanyl docosenoate	15	969.050
N-(Docosyl and elcosyl)trimethylenediamine	12	408.300
Docusate, potassium	06	591.720
Docusate, sodium	06	591.740
n-Dodecane	15	1338.000
Dodecanedioic acid	15	514.000
Dodecane nitrile	07	143.930
Dodecene	02	78.000
Dodecenyl-acetic succinimide	14	247.000
Dodecenyl succinic acid, benzotriazole salt	14	276.000
Dodeceny succinic anhydride	15	74.150
Dodecyl alcohol (Lauryl alcohol)	15	872.000
Dodecyl alcohol, ethoxylated	12	729.000
Dodecyl alcohol, ethoxylated and phosphated	12	77.000
Dodecyl alcohol, ethoxylated and sulfated, ammonium salt	12	270.000
Dodecyl alcohol, ethoxylated and sulfated, sodium salt	12	271.000
Dodecylamine	12	420.000
Dodecylaniline	03	866.200
Dodecylbenzene, other	03	870.000
Dodecylbenzene, straight-chain	03	869.000
Dodecylbenzene sulfonates, all other	12	128.000
Dodecylbenzenesulfonic acid	12	114.000
Dodecylbenzenesulfonic acid, (Mixed alkyl)amine salt	12	122.000
Dodecylbenzenesulfonic acid, ammonium salt	12	115.000
Dodecylbenzenesulfonic acid, calcium salt	12	117.000
Dodecylbenzenesulfonic acid, diethanolamine salt	12	118.000
Dodecylbenzene sulfonic acid, DMAP salt	12	118.500
Dodecylbenzenesulfonic acid, isopropanolamine salt	12	120.000
Dodecylbenzenesulfonic acid, isopropylamine salt	12	121.000
Dodecylbenzenesulfonic acid, isoproxy titanium salt	12	121.100
Dodecylbenzenesulfonic acid, monoethanolamine salt	12	122.500
Dodecylbenzenesulfonic acid, oleyl amine, ethoxylated, salt	12	122.700
Dodecylbenzenesulfonic acid, potassium salt	12	123.000
Dodecylbenzenesulfonic acid, sodium salt	12	125.000
Dodecylbenzenesulfonic acid, triethanolamine salt	12	127.000
Dodecyldiphenyloxidedisulfonic acid	12	205.990
Dodecyldiphenyloxidedisulfonic acid, disodium salt	12	206.000
tert-Dodecyldisuccinamide	15	378.000
n-Dodecylguanidine acetate (Dodine)	13	188.000
Dodecylguanidine hydrochloride	13	195.011
N-Dodecyl-3-iminodipropionic acid	12	10.500

Chemical name	Sect. Item	
	No.	No.
N-Dodecyl-3-iminodipropionic acid, disodium salt	12	11.000
N-Dodecyl-3-imino-dipropionic acid, monosodium salt	12	11.020
N-Dodecyl-3-iminopropionic acid, monosodium salt	12	10.550
tert-Dodecyl mercaptan, ethoxylated	12	759.000
n-Dodecyl mercaptans	09	171.000
Dodecylmethylbenzyl chloride	03	871.000
4-(Dodecyloxy)-2-hydroxybenzophenone	15	75.000
Dodecyloxypoly(ethyleneoxy)acetic acid, sodium salt	12	40.400
Dodecylpentadecyl methacrylate	15	952.700
p-Dodecylphenol	03	873.000
Dodecylphenol, ethoxylated	12	744.000
Dodecylphenol, ethoxylated and phosphated	12	79.000
Dodecylphenol, ethylenediamine, formaldehyde polymer, calcium salt	14	227.000
Dodecylphenyl- α -naphthylamine	14	277.000
Dodecylphenyl- α -naphthylamine, dioctyl diphenylamine co polymer	14	278.000
1-Dodecylpyridinium chloride	12	526.000
Dodecylsuccinic anhydride	15	75.800
Dodecyl succinic lactate	15	952.800
Dodecyl sulfate, ammonium salt	12	221.000
Dodecyl sulfate, diethanolamine salt	12	222.000
Dodecyl sulfate, N,N-diethylcyclohexylamine salt	12	223.000
Dodecyl sulfate, isopropanolamine salt	12	224.000
Dodecyl sulfate, magnesium salt	12	225.000
Dodecyl sulfate, potassium salt	12	226.000
Dodecyl sulfate, sodium salt	12	227.000
Dodecyl sulfate, triethanolamine salt	12	228.000
Dodecyl sulfoacetate	12	199.000
Dodecyl sulfoacetate, sodium salt	12	199.100
Dodecyl and tetradecyl alcohols, ethoxylated and sulfated, ammonium salt	12	273.000
Dodecyl and tetradecyl alcohols, ethoxylated and sulfated, magnesium salt	12	273.500
Dodecyltrimethylammonium chloride	12	489.000
Doxapram hydrochloride	06	550.001
Doxepin base	03	814.200
Doxepin hydrochloride	06	527.000
Doxycycline	06	33.000
Doxylamine succinate	06	96.000
Droperidol	06	467.500
Drug and Cosmetic Green 5	04	793.000
Drug and Cosmetic Green 6	04	794.000
Drug and Cosmetic Green 8	04	796.000
Drug and Cosmetic Orange 4	04	797.000
Drug and Cosmetic Orange 5	04	798.000
Drug and Cosmetic Orange 17	04	799.000

Table 4—Continued
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Chemical name	Sect. Item	
	No.	No.
Drug and Cosmetic Red 6	04	800.000
Drug and Cosmetic Red 7	04	801.000
Drug and Cosmetic Red 8	04	801.008
Drug and Cosmetic Red 9	04	802.000
Drug and Cosmetic Red 17	04	807.000
Drug and Cosmetic Red 19	04	808.000
Drug and Cosmetic Red 21	04	809.000
Drug and Cosmetic Red 22	04	810.000
Drug and Cosmetic Red 27	04	811.000
Drug and Cosmetic Red 28	04	812.000
Drug and Cosmetic Red 30	04	813.000
Drug and Cosmetic Red 33	04	815.000
Drug and Cosmetic Red 34	04	816.000
Drug and Cosmetic Red 38	04	817.000
Drug and Cosmetic Yellow 5	04	820.000
Drug and Cosmetic Yellow 6	04	821.000
Drug and Cosmetic Yellow 8	04	822.008
Drug and Cosmetic Yellow 10	04	823.000
Edrophonium chloride	06	575.700
Elcosane	02	79.000
Elcosanyl alcohol, phosphated	12	96.500
Enalapril maleate	06	360.100
Enflurane	06	436.500
Epichlorohydrin	15	1310.000
Epichlorohydrin bisphenol A, ethoxylated	12	744.500
Epichlorohydrin elastomers (CO, ECO) type	10	1.000
Epicillin	06	14.500
Epoxides, ethers, acetals, all other	15	1325.000
Epoxidized esters, all other	11	80.000
Epoxidized linseed oils	11	75.400
epoxidized pentaerythritol tetraphthalate	11	75.800
Epoxidized soya oils	11	76.000
Epoxy, resins advanced	08	6.000
Epoxy, resins unmodified	08	5.000
Ergocalciferol (vitamin D ₂)	06	813.000
Erucamide	15	238.000
Erucamide stearamide mix	15	239.200
[Erucyl alkyl]amine	12	420.500
Erythromycin	06	46.000
Erythromycin estolate	06	46.500
Erythromycin stearate	06	46.700
Esters of sulfated oleic acid, all other	12	263.000
Ester tin mercaptoesters	15	1404.500
Estradiol cypionate	06	674.500
Estrogens, all other	06	679.000
Estrogens, conjugated	06	675.000
Estrogens, esterified	06	676.000

Chemical name	Sect. Item	
	No.	No.
Ethanaminium, 2-hydroxy-N,N-bis(2-hydroxyethyl)-N-methyl-, salt with silicic acid	12	456.700
Ethane	02	39.000
1,2-Ethanedisulfonic acid	15	518.500
1,2-Ethanedithiol	15	1325.800
Ethanoldiglycine, disodium salt	14	43.000
4-Ethanolpiperidine	03	873.550
5-Ethanoxy-3-trichloromethyl-1,2,4-thiadiazole	03	873.700
Ethchlorvynol	06	468.000
2,2'-(1,2-Ethenediyl)bis(5[[4-chloro-6-(phenylamino)-1,3,5-triazin-2-yl]amino]benzenesulfonic acid, disodium salt	03	896.370
Ethers and thioethers, all other	12	775.000
Ethisterone	03	873.800
Ethopabate	06	172.000
Ethosuximide	06	419.000
Ethotoin	06	420.000
p-Ethoxybenzaldehyde	07	33.900
4(5)-Ethoxycarbonyl-5(4)-methylimidazole	03	874.000
N-(p-ethoxycarbonylphenyl)-n'-ethyl-n'-phenylformamidine	07	34.200
6-Ethoxy-12-dihydro-2,2,4-trimethyl quinoline	15	76.500
2-Ethoxyethanol (Ethylene glycol monoethyl ether)	15	1159.000
2-(2-Ethoxyethoxy)ethanol (Diethylene glycol monoethyl ether)	15	1160.000
2-[2-(2-Ethoxyethoxy)ethoxy]ethanol (Triethylene glycol monoethyl ether)	15	1161.000
2-(2-Ethoxyethoxy)ethyl acetate	15	1105.000
2-Ethoxyethyl acetate	15	953.000
Ethoxylated acetic acid, sodium salt	12	318.100
Ethoxylated anhydrosorbitol monolaurate	12	616.000
Ethoxylated anhydrosorbitol mono-oleate	12	617.000
Ethoxylated anhydrosorbitol monopalmitate	12	618.000
Ethoxylated anhydrosorbitol monostearate	12	619.000
Ethoxylated anhydrosorbitol monotallate	12	619.100
Ethoxylated anhydrosorbitol triester of tall oil acids	12	621.000
Ethoxylated anhydrosorbitol trioleate	12	622.000
Ethoxylated anhydrosorbitol tristearate	12	623.000
ethoxylated 1,3-butylene glycol condensed with oil fatty aciEthoxylated 1,3-butylene glycol stearate	12	707.820
Ethoxylated castor oil, ditridecylmaleate	12	707.900
Ethoxylated glycerol mono- and diesters of hydrogenated tallow acids	12	708.800
Ethoxylated glycerol and propylene glycol esters of coco fatty acids	12	708.780
Ethoxylated hydantoin glycol dicocoate	14	162.000
Ethoxylated(hydrogenated tallow amine), methyl ammonium chloride	12	458.100

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 4—Continued
Alphabetical chemical index

Chemical name	Sect. Item	
	No.	No.
Ethoxylated methyl chloride reaction products of formaldehyde and tallow diamine	12	489.500
Ethoxylated nonylphenol esters of coconut oil acids	12	709.500
Ethoxylated nonylphenol laurate	12	714.630
Ethoxylated 1,2-propanediol monostearate	12	711.000
Ethoxylated and propoxylated glycerol mono- and diesters of tallow acids	12	708.700
Ethoxylated, quaternized(C ₁₂₋₁₈ alkyl) oxypropyl trimethylene diamine	12	458.200
Ethoxylated, quaternized reaction product of formaldehyde and tallow diamine	12	458.250
Ethoxylated sorbitol beeswax ester	12	625.000
Ethoxylated sorbitol esters, all other	12	637.000
Ethoxylated sorbitol hexaester of tall oil acids	12	627.000
Ethoxylated sorbitol hexaoleate	12	628.000
Ethoxylated sorbitol lanolin ester	12	629.000
Ethoxylated sorbitol mono-oleate	12	630.000
Ethoxylated sorbitol oleate, acetylated	12	631.500
Ethoxylated sorbitol pentalaurate	12	633.000
Ethoxylated sorbitol tetraester of lauric and oleic acids	12	635.000
Ethoxylated sorbitol tetraoleate	12	636.400
Ethoxylated sorbitol tetrastearate	12	636.500
Ethoxylated tallow amine, potassium propionate derivative	12	458.500
Ethoxylated tallow amine propionate methyl sulfate, potassium salt	12	458.555
1-Ethoxy-3-methylbenzene	03	877.700
4-Ethoxy-2-methyl-N-phenylaniline	03	877.900
2-Ethoxynaphthalene	07	35.000
4-Ethoxy-2-nitroacetanilide	03	879.050
3-Ethoxypropionitrile	15	440.000
2-Ethyhexyl pelargonate	11	101.350
Ethyl acetate (100% basis)	15	954.001
Ethyl acetoacetate	15	955.000
Ethyl acrylate	15	956.000
Ethyl acrylate butyl acrylate copolymer	08	20.045
Ethyl acrylate methacrylic acid copolymer	14	419.000
Ethyl alcohol, synthetic only	15	853.000
Ethyl-alpha-cyano-beta-methyl cinnamate	03	895.300
Ethylaluminum dichloride	15	1360.000
Ethylaluminum sesquichloride	15	1361.000
Ethylamine, mono-	15	278.000
Ethylamine with borane (1:1)	15	1368.400
3'-(Ethylamino)acetanilide	03	880.200
2-Ethylaminoethanol (Ethylmonoethanolamine)	15	385.000

Chemical name	Sect. Item	
	No.	No.
2-(Ethylamino)-4-(isopropylamino)-6-(methylthio)-s-triazine (Ametryne)	13	69.000
o-Ethylaniline	03	882.500
N-Ethylaniline, refined	03	883.000
2-(N-Ethylanilino)ethanol	03	884.000
3-(N-Ethylanilino)propionitrile	03	886.000
α-(N-Ethylanilino)-m-toluenesulfonic acid	03	887.000
α-Ethyl anthranilate	07	35.800
5-Ethyl-1-aza-3,7-dioxabicyclo[3.3.0]octane	15	76.900
Ethylbenzene	03	892.000
p-(N-Ethylbenzimidobenzene)diazonium chloride		
(p-Diazo-N-benzyl-N-ethylaniline)-zinc chloride	14	351.000
Ethyl benzoate	07	35.900
Ethylbenzyl chloride	03	894.000
(Ethylbenzyl)dimethyl(mixed alkyl)ammonium chloride	12	527.000
N-Ethyl-N,N-bis(polyoxyethylene)tallow ammonium ethyl sulfate	12	458.850
Ethyl butyrate	07	144.000
Ethyl caprate	07	144.100
Ethyl cellulose	08	21.030
Ethyl chloride (Chloroethane)	15	1223.000
Ethyl chloroacetate	15	958.000
Ethyl chloroformate	15	959.000
Ethyl chlorothioformate	15	959.600
Ethyl cinnamate	07	36.000
Ethyl cyanoacetate	15	387.000
2-(N-Ethyl-N,β-cyanoethyl)-4-acetaminoanisole	03	895.100
S-Ethyl cyclohexylmethylthiocarbamate	13	69.100
Ethyl 4,4'-dichlorobenzilate (Chlorobenzilate)	13	135.700
N-Ethyl-N-(2,3-dihydroxypropyl)-m-toluidine	03	896.150
S-Ethyl d-isobutylthiocarbamate (Butylate)	13	202.500
Ethyl dimethyl(mixed alkyl)ammonium ethyl sulfate	12	490.000
O-Ethyl S,S-dipropyl phosphorodithioate	13	243.010
S-Ethyl dipropylthiocarbamate (EPTC)	13	202.000
Ethylene	02	40.000
Ethylene-acrylic acid resins (EAA)	08	31.900
N-N-Ethylenebiscocoamide	15	239.900
Ethylene bis(dithiocarbamic acid), disodium salt (Nabam)	13	183.000
Ethylene bis(dithiocarbamic acid), manganese salt with zinc ions	13	184.500
Ethylene bis(dithiocarbamic acid), zinc and manganese salts	13	187.010
Ethylene bis(dithiocarbamic acid), zinc salt (Zineb)	13	185.000
N,N'-Ethylenebis-oleamide (Oleic acid-ethylenediamine condensate (Amine/acid ratio = 1/2))	15	240.000
N,N'-Ethylenebis(stearamide)	15	241.000

APPENDIX D

Table 4—Continued
Alphabetical chemical index

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Chemical name	Sect. Item	
	No.	No.
Ethylene brassylate	07	95.750
Ethylene carbonate	15	961.000
Ethylenediamine	15	280.000
Ethylenediamine, alkoxyated	12	328.450
Ethylenediamine dihydriodide	06	583.000
Ethylenediamine dihydrochloride	15	387.990
Ethylene diamine ethoxlated	12	328.455
Ethylenediamine, propoxyated	12	328.460
Ethylenediaminetetra(methylene phosphonic acid)	14	48.000
Ethylenediaminetetra(methylene phosphonic acid, potassium salt)	14	48.500
Ethylene dibromide	14	182.000
Ethylene dichloride	15	1233.000
(Ethylenedinitrilo)tetraacetic acid		
(Ethylenediaminetetraacetic acid) (EDTA)	14	47.000
(Ethylenedinitrilo)tetraacetic acid, calcium disodium salt	14	49.000
(Ethylenedinitrilo)tetraacetic acid, diammonium salt	14	50.000
(Ethylenedinitrilo)tetraacetic acid, disodium copper salt, dihydrate	14	54.000
(Ethylenedinitrilo)tetraacetic acid, disodium salt	14	53.000
(Ethylenedinitrilo)tetraacetic acid, disodium zinc salt, dihydrate	14	56.000
(Ethylenedinitrilo)tetraacetic acid, manganese salt	14	58.000
(Ethylenedinitrilo)tetraacetic acid, monosodium iron salt	14	60.000
(Ethylenedinitrilo)tetraacetic acid, tetraammonium salt	14	61.000
(Ethylenedinitrilo)tetraacetic acid, tetrapotassium salt	14	62.000
(Ethylenedinitrilo)tetraacetic acid, tetrasodium salt	14	63.000
(Ethylenedinitrilo)tetraacetic acid, trisodium salt	14	64.000
1,1-Ethylenediurea	15	388.200
Ethylene glycol	15	1081.000
Ethylene glycol adipate	11	63.450
Ethylene glycol diacetate	15	1106.000
Ethylene glycol dimercaptoacetate	15	1107.000
Ethylene glycol dimethacrylate	15	1108.000
Ethylene glycol distearate	12	638.000
Ethylene glycol di-tributyl ether	15	1161.700
Ethylene glycol hydroxyacetate	15	1109.000
Ethylene glycol monoisobutyl ether	15	1162.000
Ethylene glycol mono-oleate	12	639.000
Ethylene glycol monostearate	12	640.000
Ethylene glycol phosphite	15	1109.700
Ethylene oxide	15	1312.000
Ethylene-propylene (EP) type	10	10.000
Ethylene-vinyl acetate (EVA) copolymer resins	08	31.700
Ethyl - α , epoxy β -methylhydrocinnamate	07	37.000

Chemical name	Sect. Item	
	No.	No.
Ethyl ether, U.S.P.	15	1315.000
Ethyl ether, absolute	15	1313.000
Ethyl ethers of tetra and higher ethylene glycols (high boiling)	15	1161.400
Ethyl ether, tech.	15	1314.000
Ethyl 3-ethoxy propionate	15	961.100
Ethyl formate	07	144.500
Ethyl glycol monoricinoleate	11	107.500
1-Ethyl-2-(8-heptadecenyl)-1-(2-hydroxyethyl)-2-imidazolium ethyl sulfate	12	460.000
Ethyl heptanoate	07	145.000
Ethylhexadecyldimethylammonium bromide	12	493.000
N-Ethyl-N-hexadecylmorpholinium ethyl sulfate	12	461.000
S-Ethyl-hexahydro-1H-azepine-1-carbothioate (Molinate)	13	70.000
2-Ethylhexanal (α -Ethylcaproaldehyde)	15	789.000
2-Ethyl-1,3-hexanediol	15	1082.000
Ethyl hexanoate	07	146.000
2-Ethylhexanoic acid (-Ethylcaproic acid)	15	519.000
2-Ethylhexanoic acid, potassium salt	12	57.300
2-Ethylhexanoic acid salts, all other	15	646.000
2-Ethyl-1-hexanol	15	854.000
2-Ethylhexanol and ethoxylated nonylphenol, polyphosphated	12	80.090
2-Ethylhexanol and ethoxylated nonylphenol, polyphosphated, sodium salt	12	80.100
2-Ethylhexanol, ethoxylated and phosphated	12	80.000
2-Ethylhexanol, ethoxylated, phosphated, potassium salt	12	80.050
2-Ethyl hexanol, phosphated, potassium salt	12	80.210
2-Ethylhexanoyl chloride	15	520.000
2-Ethyl-1-hexyl acetate	15	962.000
2-Ethyl-1-hexyl acrylate	15	963.000
2-Ethylhexyl acrylate-methy acrylate copolymer resins	08	19.970
(2-Ethylhexyl)amine, mono-	15	281.000
2-Ethylhexyl benzoate	15	79.000
N-(2-Ethylhexyl)bicyclo(2.2.1)-5-heptene-2,3-dicarboximide	13	173.000
2-Ethylhexyl chloroformate	15	963.600
2-Ethylhexyl cyclohexyl phthalate	11	39.400
2-Ethylhexyl-p-dimethylaminobenzoate	15	79.100
2-Ethylhexyl epoxytallates	11	77.000
2-Ethylhexyl glycidyl ether	15	1317.500
2-Ethylhexyl hydrogen phosphate	15	1032.000
2-Ethyl-1-hexyl methacrylate	15	964.000
2-Ethylhexyl oleate	11	90.600
2-Ethylhexyl palmitate	11	96.900
2-Ethylhexyl phosphate	12	96.800
2-Ethylhexylphosphate, potassium salt	12	96.900

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 4—Continued
Alphabetical chemical index

<i>Chemical name</i>	<i>Sect. No.</i>	<i>Item No.</i>
2-Ethylhexyl phosphate, sodium salt	12	97.000
2-Ethylhexyl polyphosphate, sodium salt	12	99.000
2-Ethyl hexyl salicylate	07	37.400
2-Ethylhexyl stearate	11	119.000
2-Ethylhexyl sulfate, sodium salt	12	243.000
p-[Ethyl(2-hydroxyethyl)amino]benzenediazonium chloride -dialzo-n-hydroxyethylaniline zinc chloride)	14	352.000
5-(N-Ethyl-N-hydroxyethylamino)-2-pentanone (N-Ethyl-N-(2-hydroxyethyl)-3-methyldehydrogen sulfate) p-phenylenediamine	15	392.000
N-Ethyl-N-hydroxyethyl-1,4-pentanediamine	14	353.000
N-Ethyl-N-hydroxyethyl-p-phenylenediamine sulfate	15	392.100
N-Ethyl-N-hydroxyethyl-p-phenylenediamine sulfate	14	354.000
Ethyl hydroxymethyl oleyl oxazoline	15	79.700
2-Ethyl-2-(hydroxymethyl)-1,3-propanediol (Trimethylolpropane)	15	1083.000
Ethylidene norbornene	15	80.000
1-Ethyl-2-isoheptadecyl-1-(2-hydroxyethyl)-2- imidazolium ethyl sulfate	12	460.020
Ethyl isovalerate	07	146.500
Ethyl laurate	07	147.000
N-Ethylmaleimide	03	896.600
Ethyl mercaptan (Ethanethiol)	02	93.000
2-(Ethylmercapto)ethanol	15	1327.000
1-Ethyl-3-methylhydantoin	03	897.030
N-Ethyl-2-methylalylamine	15	281.500
Ethyl-2-methyl butyrate	07	147.700
1-Ethyl-2-methylindole	03	897.050
Ethyl-2 methyl pentanoate	07	147.760
N-[3-(1-Ethyl-1-methylpropyl)-5-isoxazolyl]-2,6- dimethoxybenzamide (Flexidor)	13	118.062
O-Ethyl O-[4-(methylthio)phenyl] S-propyl phosphorodithioate	13	165.012
7-Ethyl-2-methyl-4-undecyl sulfate, sodium salt	12	244.000
2-Ethylmexanol, ethoxylated	12	759.500
2-Ethylmexanol, phosphated, potassium salt	12	80.200
4-Ethylmorpholine	15	81.000
Ethyl myristate	07	148.000
9-Ethyl-3-nitrocarbazole	03	899.000
O-Ethyl O-(p-nitrophenyl)phenylphosphonothioate (EPN)	13	163.000
2-Ethyl-2-nitro-1,3-propanediol	15	392.250
Ethyl nonanoate	07	149.000
Ethyl octanoate	07	150.000
Ethyl phenylacetate	07	37.800
N-Ethyl-N-phenylbenzylamine	03	901.000
O-Ethyl-S-phenylethylphosphonodithioate	13	163.200
Ethyl(polyoxyethylene, cocoamine) ethylsulfate	12	458.830
Ethyl polysilicate	15	1386.150

<i>Chemical name</i>	<i>Sect. No.</i>	<i>Item No.</i>
Ethyl propionate	07	150.200
N-(1-Ethylpropyl)-3,4-dimethyl-2,6-dinitrobenzenamine	13	118.030
3-Ethylpyridine	03	907.200
Ethyl salicylate	07	39.000
N-Ethyl-N-(soybean oil alkyl)morpholinium ethyl sulfate	12	463.000
Ethyl sulfate (Diethyl sulfate)	15	966.000
N-Ethyl-N-(3'-sulfobenzyl)aniline	03	906.103
2-(Ethylthio)-4,6-bis(isopropylamino)-s-triazine	13	118.016
Ethylthioethanol	02	93.100
N-Ethyl-p-toluenesulfonamide	11	5.000
N-Ethyl-m-toluidine	03	908.000
3-(N-Ethyl-m-toluidino)propionitrile	03	911.000
Ethyl trimethyl cyclopentenyl buterol	07	150.250
Ethyl 3,7,11-trimethyldodeca-2,4-dienoate	13	231.016
Ethyl valerate	07	150.300
Ethyl vinyl ether	15	1316.000
Etidronate, disodium	06	837.001
Etretinate	06	554.500
Expandable polystyrene beads	08	44.010
External Drug and Cosmetic Orange 3	04	827.000
External Drug and Cosmetic Yellow 7	04	829.000
Fats and oils, chemically modified, all other	15	1331.000
Fatty acid alkenolamide	12	587.940
Fatty acid amide mixtures	15	1434.000
Fatty acid esters, not included with plasticizers surface-active agents, all other	15	981.000
Fatty acid polyamine condensate	14	280.000
fatty acid residues	15	1434.300
Fatty acids, hydrogenated	15	521.000
Fatty acids, non-hydrogenated	15	522.000
Fatty acids, partially hydrogenated	15	523.000
Fatty amines	15	282.000
Fenchol	07	95.790
Fenoprofen	06	401.200
Fentanyl citrate	06	401.250
Ferrocene polymer with 2-propanone, in chlorinated wax	15	81.600
Flavoxate hydrochloride	06	745.500
Flotation reagents, all other	14	147.000
Flucytosine	06	135.700
Fludrocortisone acetate	06	656.000
Fluorelastomers (CFM, FKM, FFKM) type	10	11.000
9-Fluorenone	03	913.750
Fluorescent Brightener 52	04	767.000
Fluorescent Brightener 22	04	758.000
Fluorescent Brightener 28	04	761.000
Fluorescent Brightener 46	04	765.000
Fluorescent Brightener 49	04	766.000

APPENDIX D

Table 4—Continued
Alphabetical chemical index

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Chemical name	Sect. No.	Item No.
Fluorescent Brightener 61	04	770.000
Fluorescent Brightener 71	04	771.000
Fluorescent Brightener 102	04	773.000
Fluorescent Brightener 128	04	778.000
Fluorescent Brightener 134	04	780.000
Fluorescent Brightener 290	04	780.290
Fluorescent brighteners, all other	04	781.000
Fluorinated (Including other fluorohalogenated) hydrocarbons, all other	15	1276.000
o-Fluorobenzoyl chloride	03	913.700
Fluorocarbon resins, all other	08	38.200
Fluorometholone	06	657.000
Fluorouracil	06	278.700
Fluoxetine hydrochloride	06	527.500
Fluoxymesterone	06	640.000
Fluphenazine hydrochloride	06	485.000
Food, Drug, and Cosmetic Blue 1	04	782.000
Food, Drug, and Cosmetic Blue 2	04	783.000
Food, Drug, and Cosmetic Green 3	04	784.000
Food, Drug, and Cosmetic Red 3	04	786.000
Food, Drug, and Cosmetic Red 4	04	787.000
Food, Drug, and Cosmetic Red 40	04	787.040
Food, Drug, and Cosmetic Yellow 5	04	789.005
Food, Drug, and Cosmetic Yellow 6	04	790.000
Formaldehyde (37% HCHO by weight)	15	791.000
Formaldehyde adduct condensation	15	228.200
Formaldehyde, dicyandiamide, ethylene sulfate polymers	12	780.500
Formaldehyde polymer with carbamate esters	14	487.000
Formaldehyde polymer with ethylenediamine and nonyl phenol derivatives	14	163.000
Formic acid, 90%	15	524.000
Formic acid salts, all other	15	656.000
1-Formylpiperidine	03	919.153
Fuel additives, acyclic, all other	14	177.000
Fuel additives, cyclic, all other	14	178.000
Fumaric acid	15	525.000
Fumaric acid, lead salt	15	657.000
2-Furaldehyde (Furfural)	15	82.000
Furan	03	920.000
Furfuryl alcohol	03	921.000
Furfuryl alcohol, ethoxylated	12	744.600
Furfuryl type resins	08	7.000
1-(2-Furoyl)piperazine	03	920.200
D-Galactose	14	456.000
Gasoline additives, acyclic, all other	14	189.000
Gasoline additives, cyclic, all other	14	190.000
Gemfibrozil	06	620.500

Chemical name	Sect. No.	Item No.
Gentamycin	06	48.000
Geranyl acetate	07	151.000
Geranyl benzoate	07	40.200
Geranyl butyrate	07	153.000
Geranyl crotonate	07	153.001
Geranyl ethyl ether	07	153.007
Geranyl formate	07	153.010
Geranyl isobutyrate	07	153.020
Geranyl isovalerate	07	153.400
Geranyl and methyl tiglate	07	153.500
Geranyl nitrile (Citraiva)	07	153.560
Geranyl propionate	07	153.600
Geranyl tiglate	07	153.800
Gibberellic acid	13	168.450
Glipizide	06	688.000
Glucoamylase	14	96.000
Glucosheptonic acid, β -isomer, sodium salt	14	65.000
Glucosheptonic acid, sodium salt	14	66.000
α -Gluconamidopropyl dimethyl-2-hydroxyethyl ammonium chloride	12	471.500
Gluconic acid, potassium and sodium salts W/20% mix of sodium bisulfite-formaldehyde	12	57.530
Gluconic acid and salts, mixed	15	1434.800
Gluconic acid, technical	15	526.000
Glucono- δ -lactone	15	104.650
Glucose isomerase	14	111.000
Glucose oxidase	14	123.000
Glucose-6-phosphate dehydrogenase	14	124.000
Glutamic acid hydrochloride	14	8.000
Glutamyl-p-nitroaniline (liver function test)	06	576.500
Glutaraldehyde	15	792.000
Glutaraldehyde bis(sodium bisulfite)	15	1333.000
Glutaric acid	15	526.900
Glutaric acid esters, all other	11	85.950
Glutethimide	06	471.000
Glycerine, ethoxylated	12	761.710
Glycerine, ethoxylated and propoxylated	12	729.750
Glycerol diacetyltartrate monostearate	12	644.000
Glycerol diester of coconut oil acids	12	659.960
Glycerol dilaurate	12	651.500
Glycerol dioleate	12	652.000
Glycerol esters ethoxylates	12	644.206
Glycerol esters of chemically defined acids, all other	12	659.000
Glycerol esters of mixed acids, all other	12	668.000
Glycerol, ethoxylated	12	729.700
Glycerol, ethoxylated and phosphated	12	111.900
Glycerol kinase	14	125.000

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 4—Continued
Alphabetical chemical index

Chemical name	Sect. Item	
	No.	No.
Glycerol mixed ester of soybean oil-trimethylolpropane	12	660.500
Glycerol mono/diesters of coconut oil acids, ethoxylated	12	667.100
Glycerol mono/diesters of coconut oil acids, ethoxylated and propoxylated	12	667.150
Glycerol mono- and diesters of mixed fatty acids	12	648.800
Glycerol mono-, di-, and triesters of hydrogenated tallow acids	12	667.000
Glycerol monoester of C ₈ -C ₁₀ acids	12	660.900
Glycerol monoester of coconut oil acids	12	661.000
Glycerol monoester of coconut oil acids, sulfated, sodium salt	12	267.000
Glycerol monoester of cottonseed oil acids	12	662.000
Glycerol monoester of hydrogenated cottonseed oil acids	12	663.000
Glycerol monoester of hydrogenated lard acids	12	663.500
Glycerol monoester of hydrogenated soybean oil acids	12	664.000
Glycerol monoester of hydrogenated tallow fatty acids	12	648.900
Glycerol monoester of hydrogenated tallow acids	12	664.100
Glycerol monoester of lard acids	12	665.000
Glycerol monoester of mixed fatty acids	12	665.500
Glycerol monoester of mixed fatty acids, acetylated	12	649.000
Glycerol monoester of mixed fatty acids, phosphated	12	112.000
Glycerol monoester of mixed fatty acids, succinylated	12	649.100
Glycerol monoester of palm oil acids	12	665.800
Glycerol monoester of safflower oil acids	12	666.200
Glycerol monoester of tall oil acids	12	666.300
Glycerol monoester of tallow acids	12	666.400
Glycerol monolaurate	12	655.000
Glycerol mono-oleate	12	656.000
Glycerol mono-oleate, ethoxylated	12	650.100
Glycerol monoricinoleate	12	657.000
Glycerol monostearate	12	658.000
Glycerol propoxylate triacrylate	15	1110.600
Glycerol sesquilester of tall oil acids	12	667.600
Glycerol, synthetic only	15	1084.000
Glycerol triester of mixed fatty acids	12	667.900
Glycerol trioctanoate/decanoate	12	658.400
Glyceryl p-aminobenzoate	15	86.000
Glyceryl diacetate (Diacetin)	15	1111.000
Glyceryl monoacetate (Monoacetin)	15	1112.000
Glyceryl monoricinoleate	11	108.000
Glyceryl monothioglycolate	15	1113.000
Glyceryl triacetate (Triacetin)	15	1114.000
Glyceryl tri(acetylrucinoleate)	11	109.000
Glyceryl tribenzoate	11	5.500
Glyceryl trioleate (Triolein)	11	91.000
Glyceryl tripropionate	11	83.000
Glyceryl tripropionate	07	154.300

Chemical name	Sect. Item	
	No.	No.
Glyceryl tristearate	15	1115.500
Glycidol (2,3-Epoxy-1-propanol)	15	1317.000
α-Glycidioxypropyltrimethoxysilane	15	1387.000
Glycidyl ethers, all other	15	1317.900
Glycine (Aminoacetic acid), non-medical	14	10.000
Glycol amide stearate (amine acid ratio=1/1)	12	564.070
Glycolic acid (Hydroxyacetic acid)	15	528.000
Glycolic acid, sodium salt	15	664.000
Glycol pelargonate	11	84.000
Glycol phthalate esters, all others	11	41.700
Glycol residues	15	1435.000
Glycopyrrolate	06	288.500
Glyoxal	15	793.000
Glyoxal-formaldehyde resins	08	7.500
Grease, other than wool, sulfated, sodium salt	12	292.000
Gualacwood acetate	07	96.100
Gualene	07	96.200
Guaifenesin	06	584.000
Halcinonide	06	659.500
Half-phthalic acid ester of tallow alkanolamide/monoglyceride	12	318.300
Hellotropyl acetate	07	80.500
Hellotropyl acetone	07	80.520
Heptachloro-tetrahydro-endo-methanoindene (Heptachlor)	13	136.000
2-Heptadecyl-1,4-hydroxymethyl-4-ethyl-2-oxazoline	12	345.950
2-Heptadecyl-2-imidazolone	12	410.000
Heptadecylmethylbenzimidazolinesulfonic acid, sodium salt	12	26.000
Heptafluorobutyric anhydride	15	527.500
Heptaldehyde-aniline condensate	09	6.000
n-Heptane	02	71.000
Heptanoic acid	15	528.500
Heptanoic acid, potassium salt	12	57.550
Heptanolide	07	154.600
2-Heptanone (Methyl amyl ketone)	15	819.000
3-Heptanone (Ethyl butyl ketone)	15	820.000
Heptenes, mixed	02	72.000
n-Heptyl alcohol	15	856.000
Heptyl butyrate	07	155.005
Heptyl formate	07	155.010
Herring oil, sulfated	12	298.490
Herring oil, sulfated, sodium salt	12	299.000
Hetacillin, potassium	06	15.200
Hexabromocyclodecane	15	87.800
Hexachlorocyclopentadiene	03	924.000
1,4,5,6,7,7-Hexachloro-5-norbornene-2,3-dicarboxylic anhydride (Chlorendic anhydride)	03	925.100

Table 4—Continued
Alphabetical chemical index

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Chemical name	Sect. No.	Item No.
Hexadecane	15	1342.000
Hexadecanenitrile a	15	441.750
1-Hexadecanol (Cetyl alcohol)	15	873.000
Hexadecanolide	07	96.600
n-Hexadecenylsuccinic anhydride	15	87.925
Hexadecyl alcohol, ethoxylated	12	730.000
Hexadecylamine	12	421.000
Hexadecyldiphosphate	12	99.500
Hexadecylmonophosphate	12	99.520
N-Hexadecylmorpholine	12	347.000
Hexadecyl stearate	11	121.310
Hexadecyl sulfate, sodium salt	12	230.000
Hexadecyltrimethylammonium bromide	12	494.000
Hexadecyltrimethylammonium chloride	12	495.000
Hexafluoropropylene, monomer	15	1267.000
Hexahydro-1,3,5-triethyl-s-triazine	13	40.012
Hexahydro-1,3,5-tri(2-hydroxyethyl)-s-triazine	13	40.022
Hexamethyldisilazane	15	1387.500
Hexamethylenediamine adipate (Nylon salt)	15	397.000
Hexamethylenediaminetetra(methylenephosphonic acid), potassium salt	14	68.000
Hexamethylenimine	03	927.870
Hexamethylenetetramine, tech.	15	88.000
N-hexanal	07	155.310
Hexane	02	65.000
1,6-Hexanediamine (Hexamethylenediamine)	15	283.000
1,6-Hexanediol	15	1085.000
1,6-Hexanediol diacrylate	15	1117.000
Hexanoic acid [Caproic acid]	07	155.200
2-Hexenal	07	155.300
Hexenes, mixed	02	67.020
2-Hexenol	07	155.400
cis-3-Hexen-1-yl acetate	07	155.650
cis-3-Hexenyl benzoate	07	155.652
cis-3-Hexenyl butyrate	07	155.653
cis-3-Hexenyl methyl carbonate	07	155.654
cis-3-Hexenyl salicylate	07	40.500
Hexenylsuccinic anhydride	15	88.200
cis-3-Hexenyl tiglate	07	155.656
Hexoxyacetaldehyde dimethyl acetal	07	155.700
Hexyl acetate	15	984.000
Hexyl acetate	07	155.705
Hexyl acrylate	15	985.000
n-Hexyl alcohol	15	857.000
N-Hexyl alcohol, ethoxylated	12	729.900
Hexylalcohol, ethoxylated and phosphated	12	80.500
Hexylalcohol, phosphated, K salt solubilized	12	80.550

Chemical name	Sect. No.	Item No.
n-Hexylamine	15	284.000
Hexylamine ethoxylate	15	398.000
Hexyl butyrate	07	155.708
Hexyl caproate	07	155.710
Hexyl (Isonanoyl anide) carboxylic acid, mono, triethanolamine salts	12	57.560
Hexyl chloride	15	1238.100
α -Hexylcinnamaldehyde	07	41.000
2-Hexyl-2-cyclopenten-1-one	07	96.800
2-Hexyl-1-decanol	15	875.000
n-Hexyl n-decyl adipate	11	63.600
Hexyl n-decyl phthalate	11	44.000
Hexyl(isonanoyl anide)carboxylic acid, triethanol-, diethanolamine, mixed salts	12	57.565
Hexyl 2-methylbutyrate	07	155.715
Hexyl nitrate	14	149.000
2-[2-(Hexyloxy)ethoxy]ethanol	15	1164.000
Hexyloxypropyl amine	12	328.600
Hexyl phosphate	12	99.900
Hexyl phosphate, potassium salt	12	99.910
Hexyl sulfate, potassium salt	12	231.000
Hexyltrichlorosilane	15	1387.530
Homomenthyl salicylate	15	89.000
Hormones and synthetic substitutes, all other	08	697.000
Humatrope	06	693.500
Hydralazine hydrochloride	06	357.000
Hydratropaldehyde	07	42.000
Hydratropaldehyde, dimethyl acetal	07	43.000
Hydrazine acetate	15	594.500
Hydrindantin	15	91.000
Hydrocarbon carboxylic acid derivatives (specify)	14	205.000
Hydrocarbon derivatives: all other hydrocarbon derivatives	02	97.000
Hydrocarbon phosphorous acid, barium salt	14	206.000
Hydrocarbon phosphoryl derivatives	14	207.000
Hydrocarbons, all other	15	1349.000
Hydrocarbons, C ₄ , all other	02	52.000
Hydrocarbons, C ₆ , all other	02	59.000
Hydrocarbons, C ₈ , all other	02	68.000
Hydrocarbons, C ₇ , all other	02	73.000
Hydrocarbons, C ₉ , all other	02	77.000
Hydrocarbons, C ₉ ' and above, all other, including mixtures	02	89.000
Hydrocarbons, C ₄ fraction	02	51.200
Hydrocarbons, C ₂ -C ₃ mixtures	02	43.000
Hydrocarbons, C ₄ mixtures	02	49.600
Hydrocarbons, C ₆ mixtures	02	58.500

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 4—Continued
Alphabetical chemical index

Chemical name	Sect. Item	
	No.	No.
Hydrocarbons, C ₆ -C ₈ mixtures	02	87.030
Hydrocarbons, C ₆ -C ₇ mixtures	02	67.040
Hydrocarbons, C ₆ -C ₉ mixtures	02	89.010
Hydrocarbons, C ₆ -C ₇ mixtures	02	72.500
Hydrochlorothiazide	06	722.000
Hydrocinnamic acid	07	43.500
Hydrocodone bitartrate	06	433.000
Hydrocortisone	06	660.000
Hydrocortisone acetate	06	661.000
Hydrocoumarin	07	44.000
Hydrogenated castor oil, ethoxylated	12	670.000
Hydrogenated menhaden fish oil	15	1329.050
Hydrogenated tallow acids, (Ratio = 2/1)	12	558.000
Hydrogenated tallow acids, aminoethylethanolamide, acetate salt	12	575.280
(Hydrogenated tallow alkyl)amine	12	422.000
(Hydrogenated tallow alkyl)amine acetate	12	394.000
(Hydrogenated tallow alkyl)amine, ethoxylated	12	329.000
(Hydrogenated tallow alkyl)amine, ethoxylated, diethosulfate	12	463.700
(Hydrogenated tallow alkyl)trimethylammonium chloride	12	498.000
Hydrogenated tallow amides, ethoxylated	12	575.200
1-(2-Hydrogenated tallow amidoethyl)-2-nor(hydrogenated tallow)-2-imidazoline	12	386.500
Hydrogenated tallow fatty acid aminoethylethanolamine condensation products	14	488.000
Hydrogenated tallow glycerides	15	1329.000
Hydrogenated tallow glycerides diethylenetriamine condensate	12	587.945
Hydrolytic enzyme mixtures	14	113.000
Hydroquinone (Hydroquinol)	14	357.000
Hydroquinone, di(β-hydroxyethyl) ether	15	91.250
Hydroquinone, tech.	03	934.000
p-Hydroxybenzenesulfonic acid	03	944.000
p-Hydroxybenzoic acid	03	946.000
p-Hydroxybenzoic acid, benzyl ester	15	91.900
p-Hydroxybenzoic acid, butyl ester	15	92.000
p-Hydroxybenzoic acid, ethyl ester	15	93.000
p-Hydroxybenzoic acid, methyl ester	15	94.000
p-Hydroxybenzoic acid, propyl ester	15	95.000
4-Hydroxy-2H-1,2-benzothiazine-3-carboxylic acid, methyl ester, 1,1-dioxide	03	947.000
4-Hydroxybenzylbenzene	03	948.000
Hydroxychloroquine sulfate	06	175.000
2-Hydroxycineole	03	952.650
Hydroxycitronellal methyl anthranilate	07	44.050
Hydroxycitronellol	07	156.500

Chemical name	Sect. Item	
	No.	No.
2'-Hydroxy-5,9-dimethyl-6,7-benzomorphan	03	953.550
7-Hydroxy-3,7-dimethyl-1-octanal (Hydroxycitronellal)	07	156.000
7-Hydroxy-3,7-dimethyl octanal, dimethyl acetal (Hydroxycitronellal, dimethyl acetal)	07	157.000
Hydroxyethane-1-diphosphonic acid	14	69.000
4-Hydroxy-3-ethoxybenzaldehyde (Ethylvanillin)	07	44.100
Hydroxyethyl acrylate	15	1119.000
3-[N-(2-Hydroxyethyl)anilino]propionitrile	03	956.000
Hydroxyethylcellulose	14	409.000
(2-Hydroxyethyl)dimethyl(3-stearamidopropyl) ammonium dihydrogen phosphate	12	472.000
(2-Hydroxyethyl)dimethyl(3-stearamidopropyl) ammonium nitrate	12	474.000
N-(2-Hydroxyethyl)-1,2-diphenylethylenediamine	12	351.000
(N-Hydroxyethylethylenedinitrilo)triacetic acid, iron salt	14	72.000
(N-Hydroxyethylethylenedinitrilo)triacetic acid, trisodium salt	14	74.000
1-Hydroxyethyl-1-(2-hydroxy-3-sodiumsulfonatopropyl)-2-capryl-2-imidazolium hydroxide	12	26.600
1-Hydroxyethyl-1-(2-hydroxy-3-sodiumsulfonatopropyl)-2-nor-coconut oil fatty acids-2-imidazolium hydroxide	12	26.700
1-Hydroxyethyl-1-(2-hydroxy-3-sodiumsulfonatopropyl)-2-oleyl-2-imidazolium hydroxide	12	26.800
Hydroxyethylidene diphosphonic acid, potassium salt	14	75.000
Hydroxyethylidene diphosphonic acid, sodium salt	14	76.000
Hydroxyethyl methacrylate	15	1119.200
p-[(2-Hydroxyethyl)methylamino]benzenediazonium chloride (p-Diazo-N-hydroxyethyl-N-methylaniline)-zinc chloride	14	359.000
1-(2-Hydroxyethyl)-2-nonyl-2-imidazolium	12	348.000
1-(2-Hydroxyethyl)-2-nor(coconut oil alkyl)-2-imidazolium	12	349.000
1-(2-Hydroxyethyl)-2-nor(soya oil alkyl)-2-imidazolium	12	351.600
1-(2-Hydroxyethyl)-2-nor(tall oil alkyl)-2-imidazolium	12	350.000
2-Hydroxyethyl n-octyl sulfide	13	233.010
N-(Hydroxyethyl)piperazine	15	96.000
3-Hydroxy-2-ethyl-4-pyrone (Ethylmaltol)	07	97.000
1-(2-Hydroxyethyl)-1-(sodium carboxymethyleneoxyethylene)-2-nor-coconut oil fatty acids-2-imidazolium hydroxide	12	26.900
1-(2-Hydroxyethyl)-2-(tall oil alkyl)imidazolium, fatty acid salt	12	351.700
N-(2-Hydroxyethyl)-N,N',N'-tris(2-hydroxypropyl)-ethylenediamine	12	330.000
Hydroxyethyl-2-undecyl-2,3-imidazolium	12	464.000

Table 4—Continued
Alphabetical chemical index

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Chemical name	Sect. No.	Item No.
2-Hydroxy, 3-(lauryl-myristyl) (oxy-1 propane sulfonic acid), sodium salt	12	207.050
4-Hydroxymetaniamide	03	965.000
4-Hydroxy-3-methoxybenzaldehyde [Vanillin]	07	44.300
2-Hydroxy-4-methoxybenzophenone	15	97.000
4(4-Hydroxy-3-methoxyphenyl)-2-butanone (Vanillyacetone)	07	44.800
2-[(Hydroxymethyl)amino]-2-methylpropanol	13	245.014
4-Hydroxy-2-methyl-2H-1,2-benzothiazine-3-carboxylic acid, methyl ester, 1,1-dioxide	03	969.050
2-Hydroxymethylene-17 α -ethinylandro-17 β -ol-4-en-3-one		03 969.010
2-(Hydroxymethyl)ethanol	13	245.012
N-(Hydroxymethyl)-formamide	15	244.950
Hydroxymethyl-5,5-hydantoin	15	99.500
Hydroxymethyl(methyl)dithiocarbamic acid, potassium salt	13	185.500
4(5)-Hydroxymethyl-5(4)-methylimidazole	03	970.500
4(5)-Hydroxymethyl-5(4)-methylimidazole hydrochloride	03	970.502
4-Hydroxymethyl-4-methyl-1-phenyl-3-pyrazolidone	14	360.000
2-(Hydroxymethyl)-2-methyl-1,3-propanediol (Trimethylolethane)	15	1086.000
2-(Hydroxymethyl)-2-nitro-1,3-propanediol (Tris-(hydroxymethyl)nitromethane)	15	401.000
4-Hydroxy-4-methyl-2-pentanone (Diacetone alcohol)	15	823.000
4-(4-Hydroxy-4-methyl pentyl)-3-cyclohexene-10-carboxaldehyde (Lyal)	07	97.200
3-Hydroxy-2-methyl-4-pyrone (Maltol)	07	98.000
3-Hydroxy-N-(3-N-morpholino- γ -propyl)-2-naphthimide	03	972.500
7-Hydroxy-1,3-naphthalenedisulfonic acid, disodium salt	03	978.000
3-Hydroxy-2-naphthoic acid (B.O.N.)	03	992.000
3-Hydroxy-2-naphthoic acid, ethanamide	03	992.302
1-Hydroxynaphthoic acid, methyl ester	03	990.500
3-Hydroxy-2-naphthoic acid, methyl ester	03	993.000
3-Hydroxy-2-naphthoic acid, sodium salt	03	994.802
2-Hydroxynaphthoic ethylamide	14	358.000
2-Hydroxy-1,4-naphthoquinone	03	994.903
1-(2-Hydroxy-1-naphthylazo)-6-nitro-2-hydroxynaphthalene-4-sulfonic acid	03	997.100
4-Hydroxynonanoic acid, γ -lactone (γ -Nonalactone)	07	99.000
p-Hydroxy phenylbutanone	07	44.850
α -D-p-Hydroxyphenylglycine methyl ester K	15	100.200
p-Hydroxyphenyl-3-methylbutyric acid	03	1001.227
Hydroxyprogesterone caproate	06	679.800
2-Hydroxy-3(2-propenyloxy)-1-propanesulfonic acid, sodium salt	15	666.015
Hydroxypropyl acrylate	15	1120.000
Hydroxypropyl ammonium cyano acetate	12	497.800
Hydroxypropyl guar gum	14	421.000

Chemical name	Sect. No.	Item No.
Hydroxypropyl methacrylate	15	1121.000
N-2-hydroxy propyl-n-methyl-N,n-bis[tallow amide ethyl] ammonium ethyl sulfate	12	474.190
8-Hydroxy-5-quinolinesulfonic acid	06	261.000
4-Hydroxy-2,2,6,6-tetramethyl-1-piperidinyloxy	15	100.040
4-Hydroxyundecanoic acid, γ -lactone (γ -Undecalactone)	07	101.000
Hydroxyzine pamoate	06	502.000
Hygromycin B	06	66.000
Ibuprofen	06	401.500
Imidazoline from tall oil fatty acids and diethylenetriamine	14	164.000
Imidazolium, 1-carboxymethyl)-4,5-dihydro-1-(hydroxyethyl)-2-nor(cocoalkyl), hydroxides, monosodium salts	12	474.400
Imidazolium, 1-(carboxymethyl)-2-heptyl-1-(2-hydroxyethyl), hydroxide, sodium salt	12	474.430
Iminodiacetic acid	15	403.000
Imipenem	06	62.100
Imipramine hydrochloride	06	528.000
1,2,3-Indantrione monohydrate (Ninhydrin)	15	103.000
3-Indolebutyric acid	13	168.600
Indomethacin	06	402.000
Insulin	06	694.000
Interferon	06	278.500
Iodinated glycerol	06	586.000
Iodinated (Not otherwise halogenated) hydrocarbons, all other	15	1281.000
Iodobutane	15	1277.900
Iodochlorhydroxyquin	06	176.000
Iodoethane (Ethyl iodide), non-medical	15	1278.000
Iodoform	06	262.000
Iodomethane (Methyl iodide)	15	1280.000
1-Iodoperfluorohexane	15	1268.000
10-(p-Iodophenyl)undecanoic acid, ethyl ester	03	1016.662
3-Iodo-2-propynyl butylcarbamate	13	245.013
Iohexol	06	566.000
Ionone(α - and β -)	07	104.000
α -Ionone	07	102.000
β -Ionone	07	103.000
Iothalamate, meglumine	06	570.000
Iprondazole	06	176.300
Iron acetylacetonate complex	15	1371.750
Iron 2-ethylhexanoate	15	636.000
Iron naphthenate	14	303.000
Isethionic acid (2-Hydroxyethanesulfonic acid)	15	532.000
Isoamyl alcohol, ethoxylated	12	730.100
Isoamylene	02	54.200

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 4—Continued
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Chemical name	Sect. Item	
	No.	No.
Isoamyl ethylmalonate	15	986.000
Isoamyl phenylacetate	07	45.300
Isoascorbic acid (Erythorbic acid)	15	533.000
Isoascorbic acid, sodium salt (Sodium erythorbate)	15	667.000
Isobornyl acetate	07	105.000
Isobornyl methyl ether	07	105.200
Isobornyl propionate	07	105.300
Isobutane (2-Methylpropane)	02	50.000
Isobutanol glycol ether	15	1164.900
Isobutyl acetate	15	892.000
Isobutyl acetate	07	158.000
Isobutyl acrylate	15	987.000
Isobutyl alcohol (Isopropylcarbinol)	15	849.000
Isobutylaluminum chloride	15	1361.500
Isobutybenzene	03	1016.750
Isobutyl benzoate	07	45.600
Isobutyl butyrate	07	158.005
Isobutyl chloroformate	15	988.000
Isobutylene (2-Methylpropene)	02	51.000
Isobutyl isobutyrate	15	989.000
Isobutyl methacrylate	15	989.500
Isobutyl palmitate	11	97.000
Isobutyl phenylacetate	07	46.000
Isobutylquinoline	07	46.400
Isobutyl salicylate	07	47.000
Isobutyl stearate	11	121.390
Isobutyltrimethoxysilane	15	1387.600
Isobutyraldehyde	15	796.000
Isobutyric acid	15	534.000
Isobutyric anhydride	15	535.000
Isobutyronitrile	15	443.000
Isocamphyl cyclohexanols	07	105.350
Isocetyl stearate	15	971.800
Isocyanic acid derivatives, all other	03	1026.000
Isodecyl acrylate	15	990.000
Isodecyl alcohol	15	857.500
Isodecyl alcohol, alkoxyated	12	730.150
Isodecyl alcohol, ethoxylated	12	760.900
Isodecyl alcohol, ethoxylated and propoxylated	12	760.910
Isodecyl diphenyl phosphate	11	12.500
Isodecyl methacrylate	15	990.700
Isodecyloxypropylamine	12	330.100
Isodecyloxypropylamine, ethoxylated	12	330.103
Isodecyloxypropyliminopropionic acid, monosodium salt	12	13.900
N-Isodecyloxypropyl trimethylene diamine	12	330.350
Isodecyl pelargonate	11	85.000
Isodecyl stearate	11	121.395

Chemical name	Sect. Item	
	No.	No.
Isoflurane	06	439.001
Isoheptanes	02	69.000
Isoheptyl alcohol	15	857.700
Iso-Hexadecenyl succinic anhydride	15	87.900
Isohexane	02	66.000
Isolongifolene epoxide	07	105.800
Isomenthone	07	106.000
Isonanoic acid, mono- and triethanolamine salt	12	564.150
Isonanoic acid, sodium salt	12	57.570
Isononylamidocaproic acid, triethanolamine salt	12	27.000
Isonicotinamide	03	1027.503
Isononanoic acid, lead salt	15	672.500
Isononanoyl chloride	15	536.730
Isononyl acetate	07	158.800
Isononyl alcohol	15	858.000
Isononyloxypropylamine	12	330.500
Iso-octadecenoic acid	15	536.800
Iso-octadecenylsuccinic anhydride	15	103.950
Iso-octadecyl alcohol	15	858.800
Isooctanoic acid, calcium salt	15	672.600
Iso-octyl alcohol	15	859.000
Iso-octyl hydrogen phosphate	15	1033.000
Iso-octyl mercaptoacetate	15	991.000
Iso-octyl-3-mercaptopropionate	15	992.000
Iso-octyl oleate	11	92.600
Iso-octylphenol, ethoxylated	12	745.000
Isooctyl phosphate	12	100.400
Iso-octylphenol, ethoxylated and sulfonated, sodium salt	12	207.100
Isopentane (2-Methylbutane)	02	53.000
Isopentanoic acid	15	538.200
Isopentyl acetate (Isoamyl acetate)	07	158.950
Isopentyl benzoate	07	47.700
Isopentyl butyrate	07	159.000
Isopentyl caproate	07	159.500
Isopentyl formate	07	160.000
Isopentyl isovalerate	07	161.000
Isopentyl propionate	07	161.500
Isopentyl salicylate	07	48.000
Isophthalic acid (Benzene-1,3-dicarboxylic acid)	03	1031.000
Isophthalonitrile	03	1034.000
Isophthaloyl chloride	03	1034.100
Isoprene (2-Methyl-1,3-butadiene)	02	54.000
Isopropenylaluminum	15	1362.000
Isopropoxy-tris(2-ethylenediamino)ethyl titanate	12	330.270
Isopropyl acetate	15	993.000
Isopropyl alcohol	15	860.000
Isopropylamine, mono	15	287.000

Table 4—Continued
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Chemical name	Sect. Item	
	No.	No.
Isopropyl 4-amino benzene sulfonyl di(dodecylbenzenesulfonyl) titanate	12	137.400
2-Isopropylaminoethanol	15	411.000
3-Isopropyl-1H-2,1,3-benzothiadiazin-4(3H)-one 2,2-dioxide	13	73.100
Isopropylbiphenyl	03	1035.118
Isopropyl borate	15	1368.730
Isopropyl chloroformate	15	994.000
Isopropyl N-(3-chlorophenyl) carbamate (CIPC)	13	74.000
2-Isopropylcyclohexanol	07	106.200
6-Isopropyldecalone	07	106.210
Isopropyl ether	15	1319.000
4,4'-Isopropylidenebis[2,6-dibromophenol] (Tetrabromobisphenol A)	03	1036.000
4,4'-Isopropylidenediphenol (Bisphenol A)	03	1038.000
4,4'-Isopropylidenediphenol, ethoxylated	03	1039.000
4,4'-Isopropylidenediphenol, propoxylated	03	1040.000
Isopropyl lanolate	15	971.900
Isopropyl linoleate	15	972.000
Isopropyl mercaptan (2-Propanethiol)	02	96.030
Isopropyl-11-methoxy-3,7,11-trimethyldodeca-2,4-dienoate	13	231.014
p-Isopropyl- α -methylhydrocinnamaldehyde (Cyclamen aldehyde)	07	49.000
Isopropyl myristate	11	88.000
Isopropyl myristate	12	711.460
Isopropyl naphthalenesulfonic acid	12	170.000
Isopropyl oleate, sulfated, sodium salt	12	260.000
Isopropyl palmitate	11	98.000
Isopropyl palmitate	12	711.450
o-Isopropylphenol	03	1041.000
Isopropyl N-phenylcarbamate (IPC)	13	75.000
N-Isopropyl-N'-phenyl-p-phenylenediamine	09	63.000
Isopulegyl acetate	07	106.220
Isostearamidopropyl dimethylamino glycolate	12	474.500
Isostearic acid, aminoethylethanolamide, acetate salt	12	575.340
Isostearic acid, isoproxy titanium salt	12	57.600
Isostearic acid, triethanolamine salt	12	29.500
Isostearic amphopropionate	12	13.100
Isostearyl alcohol, ethoxylated	12	730.200
Isostearylamidopropyl dimethylethylammonium ethyl sulfate	12	474.525
Isostearyl imidazoline	12	354.150
Isostearyl neopentanoate	15	995.000
Isothiocyanic acid, phenyl ester	03	1043.102
Isotridecyloxypropylamine	12	330.300
Isotridecyloxypropylamine, ethoxylated	12	330.305
N-Isotridecyloxypropyl trimethylene diamine	12	330.320

Chemical name	Sect. Item	
	No.	No.
Isovalerone (Diisobutyl ketone)	15	824.000
2-Isovaleryl-1,3-indandione	13	169.900
Itaconic acid (Methylenesuccinic acid)	15	539.000
Ivermectin	06	133.001
Jet amine D-2o (tall oil derivative)	12	410.300
Jet amine ether diamine	12	330.600
Jetamine primary (hard tallow)amine	12	422.520
Jetamine primary cocoamine	12	422.500
Jetamine primary oleoamine	12	422.540
Jetamine primary soya-amine	12	422.560
Kanamycin	06	50.000
Ketamine hydrochloride	06	437.000
Ketimine, tetrafunctional	15	414.000
Lactic acid, edible, 100%	15	541.000
Lactic acid salts, all other	15	675.000
Lactic acid, technical, 100%	15	542.000
Lactobionic acid	07	106.400
Lactones, all other	15	104.750
Lactonitrile	15	445.000
Lanolin acetate	15	104.760
Lanolin acid	15	104.763
Lanolin acid, isopropyl ester	15	104.765
Lanolin alcohol acetate	15	104.770
Lanolin alcohol, propoxylated	12	736.700
Lanolin, ethoxylated	12	671.000
Lard oil acids	12	533.650
Lard, sulfated, sodium salt	12	293.000
Lasalocid	06	66.500
Latex type polyvinylidene chloride resins	08	50.010
Lauraldehyde	07	162.000
3-Lauramido-N,N-dimethylpropylamine oxide	12	387.000
(3-Lauramidopropyl)trimethylammonium methyl sulfate	12	475.000
Lauric acid	12	570.000
Lauric acid (Ratio = 1/1)	12	547.000
Lauric acid (Ratio = 2/1)	12	534.000
Lauric acid—ethanolamine condensate, ethoxylated	12	578.500
Lauric acid, potassium salt	12	58.000
Lauric and myristic acid (Ratio = 1/1)	12	547.200
Lauric and myristic acids	12	571.000
Lauric and myristic acids (Ratio = 2/1)	12	535.000
Lauric and myristic acids (Ratio = 1/1)	12	564.400
Lauroamphocarboxyglycinate	12	13.480
Lauronitrile (Dodecyl nitrile)	15	446.000
Lauroyl chloride	15	543.000
Lauroyl peroxide	15	1296.400
N-Lauroylsarcosine, sodium salt	12	44.000
Lauryl acrylate	15	995.270

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 4—Continued
Alphabetical chemical index

Chemical name	Sect. Item	
	No.	No.
Lauryl alcohol, phosphated	12	100.600
Lauryl alcohol, phosphated, potassium salt	12	100.700
Laurylamidopropyl betaine	12	13.400
Laurylamidopropyldimethyl amine	12	387.040
Laurylamphoglycinate	12	13.500
Lauryl chlorides	15	1239.000
Lauryl lactate	15	996.000
Lauryl methacrylate	15	997.000
Lauryl methacrylate-stearyl methacrylate copolymer resins	08	19.980
Lauryl pyridinium chloride	12	498.500
Lauryl sulfate, sodium salt	12	231.700
Lead acetate	15	595.000
Lead-cobalt neodecanoate	15	706.000
Lead 2-ethylhexanoate	15	637.000
Lead linoleate	15	684.000
Lead manganese tallate	15	175.000
Lead naphthenate	14	306.000
Lead neodecanoate	15	707.000
Lead salts of menhaden fish oil, C ₁₄ to C ₂₂ (lead fishate)	15	680.500
Lead stearate	15	756.000
Lead stearate, dibasic	15	757.000
Lead subacetate	15	596.000
Lead tallate	15	176.000
Leuco quinizarin (1,4,9,10-Anthratetrol)	03	1045.000
Leuco Sulfur Black 1	04	1107.000
Leuco Sulfur Black 2	04	1110.000
Leuco Sulfur Black 18	04	1115.018
Leuco Sulfur Blue 7	04	1075.000
Leuco Sulfur Blue 11	04	1080.000
Leuco Sulfur Brown 1, 1:1	04	1089.000
Leuco Sulfur Brown 3	04	1091.000
Leuco Sulfur Brown 10	04	1093.000
Leuco Sulfur Brown 37	04	1101.000
Leuco Sulfur Brown 52	04	1101.052
Leuco Sulfur Green 3	04	1085.000
Leuco Sulfur Green 16	04	1087.000
Leuco Sulfur Green 35	04	1087.035
Leuco Sulfur Green 36	04	1087.036
Leuco Sulfur Red 14	04	1070.014
Leuco Sulfur Yellow 17	04	1064.017
Leuco Sulfur Yellow 21	04	1064.021
Leuco Sulfur Yellow 22	04	1064.022
Leuprokide acetate	06	278.600
Leuco Sulfur Brown 95	04	1104.095
Levodopa	06	835.000

Chemical name	Sect. Item	
	No.	No.
Levothyroxine, sodium	06	694.500
Lidocaine	06	706.000
Lidocaine hydrochloride	06	706.100
Light-oil distillates, all other	01	9.000
Lignin amine	12	357.010
Lignin, ethoxylated	12	761.900
Lignin, sodium salt	12	318.400
Ligninsulfonic acid, aluminum salt	12	152.000
Ligninsulfonic acid, ammonium salt	12	153.000
Ligninsulfonic acid, calcium salt	12	154.000
Ligninsulfonic acid, chromium salt	12	155.000
Ligninsulfonic acid, iron salt	12	156.000
Ligninsulfonic acid, magnesium salt	12	157.000
Ligninsulfonic acid, manganese salt	12	157.100
Ligninsulfonic acid, mixed chromium and iron salts	12	157.200
Ligninsulfonic acid, potassium salt	12	157.700
Ligninsulfonic acid, sodium salt	12	158.000
Ligninsulfonic acid, zinc salt	12	158.500
l-Limonene	07	50.200
d-Limonene, synthetic	07	106.600
Linalyl anthranilate	07	49.500
Linalyl formate	07	162.250
Lincomycin (animal feed grade)	06	67.000
Lincomycin (medicinal grade)	06	51.000
Linear alcohols, sulfated, all other	12	240.000
Linear saturated polyester	14	387.000
Linoleic acid (Ratio = 1/1)	12	547.800
Linoleic acid (Ratio = 2/1)	12	536.000
Linoleic acid dimers, alkoxyated	12	711.200
Linseed oil, oxygenated	15	1329.400
Lipase	14	114.000
Lithium heparin	06	627.000
Lithium hydroxystearate	15	1373.500
Lithium naphthenate	14	307.000
Lithium neodecanoate	15	708.000
Lithium stearate	15	758.000
Lubricating oil and grease additives, acyclic, all other	14	293.000
Lubricating oil and grease additives, cyclic, all other	14	294.000
Mafenide	06	202.900
Mafenide acetate	06	203.000
Magnesium acetate	15	598.000
Magnesium butoxide, modified	15	1375.500
Magnesium citrate	06	592.000
Magnesium gluconate	06	764.000
Magnesium methylate	15	1352.000
Magnesium stearate	15	759.000
Maleated esterified tall oil	12	318.470

Table 4—Continued
Alphabetical chemical index

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Chemical name	Sect. Item	
	No.	No.
Maleated linseed oil	12	318.475
Maleic acid	15	545.000
Maleic acid, monoalkyl ester	12	44.500
Maleic anhydride	15	104.800
Maleic anhydride, polypropylene glycol copolymer	12	711.700
Maleic esters and copolymers	15	999.000
Malic acid	15	547.000
Malonaldehyde bis(dimethyl) acetal	15	1324.000
Malonanilide	03	1048.930
Maltase	14	97.000
D-Maltose	14	459.000
Manganese acetate	15	599.000
Manganese acetylacetonate complex	15	1371.800
Manganese 2-ethylhexanoate	15	639.000
Manganese gluconate	06	765.000
Manganese naphthenate	14	309.000
Manganese neodecanoate	15	709.000
Manganese stearate	15	760.000
Manganese tallate	15	177.000
Mannitol	15	1087.000
Maprotiline hydrochloride	06	529.000
Mecizine hydrochloride	06	81.000
Meclofenamate, sodium	06	402.500
Meclofenamic acid	06	402.600
Medicinal chemicals, all other	06	837.000
Medroxyprogesterone acetate	06	680.000
Medrysone	06	662.000
Mefenamic acid	06	403.000
Megestrol acetate	06	680.500
Melamine	03	1050.000
Melamine formaldehyde methanol polymer	14	483.000
Melamine-formaldehyde resins	08	8.000
Melamine formaldehyde triethanolamine mixed fatty alcohols polymer	14	484.000
Melamine stearyl alcohol polymer	14	490.000
Melengestrol acetate	06	681.000
Menadione sodium bisulfite (anhydrous)	06	826.000
Menadione sodium bisulfite (trihydrate)	06	826.100
p-Mentha-1,3-diene (α -Terpinene)	07	107.600
p-Mentha-1,4-diene (γ -Terpinene)	07	107.700
p-Mentha-1,8-diene (Limonene)	07	50.000
di-p-Mentha-1,8-diene (Limonene)	03	1052.000
p-Mentha-6,8-dien-z-ol (Carveol)	07	106.800
p-Mentha-6,8-dien-z-one (Carvone, Carvol)	07	107.000
1-p-Mentha-6,8-dien-2-yl acetate (Carvyl acetate)	07	107.100
p-Menth-8-en-3-ol (Isopulegol)	07	108.300
p-Menth-1-en-3-one (Piperitone)	07	108.400

Chemical name	Sect. Item	
	No.	No.
p-Menth-4-(8)-en-3-one (Pulegone)	07	108.700
1-1-p-Menthen-6-yl-1-propanone	07	108.600
d-Menthol	07	110.000
dl-Menthol, synthetic	07	110.100
l-Menthol, synthetic	07	110.200
Menthyl acetate	07	111.000
l-Menthyl acetate	07	111.100
Menthyl anthranilate	07	50.500
8-p-Menthyl hydroperoxide	15	106.000
Mepiridine hydrochloride	06	404.000
Mepivacaine	06	706.400
Meprednisone	06	662.500
Mercaptoacetic acid (Thioglycolic acid)	15	549.000
2-Mercaptobenzothiazole	09	30.000
2-Mercaptobenzothiazole, copper salt	09	30.300
2-Mercaptobenzothiazole derivative	09	30.600
2-Mercaptobenzothiazole, sodium salt	13	40.024
2-Mercaptobenzothiazole, zinc salt	09	32.000
2-Mercaptoethanol	15	1353.000
3-Mercapto-1,2-propanediol (Thioglycerol)	15	1088.000
3-Mercaptopropionic acid	15	550.000
Mercaptopropyltrimethoxysilane	15	1388.000
Mercaptopurine	06	279.000
Mercaptosuccinic acid (Thiomalic acid)	15	551.000
2-Mercaptotoluimidazole, zinc salt	09	41.475
Mercury fungicides cyclic, all other	13	24.000
Methacrylamide	15	247.000
Methacrylate based cationic polyelectrolytes	15	1450.600
Methacrylic acid	15	552.000
α -Methacryloxypropyltrimethoxysilane	15	1389.000
Methadone hydrochloride	06	405.000
Methamphetamine	06	519.800
Methamphetamine hydrochloride	06	520.000
Methane	02	37.000
Methanearsonic acid, disodium salt (DSMA)	13	204.000
Methanearsonic acid, monosodium salt (MSMA)	13	205.900
Methanesulfonic acid	15	553.000
Methanesulfonyl chloride	15	554.000
Methanol, synthetic only	15	861.000
Methenamine hippurate	06	240.000
Methenamine mandelate	06	241.000
Methimazole	06	645.000
Methionine (animal feed grade)	14	13.000
Methionine, hydroxy analogue, calcium salt	14	15.000
Methocarbamol	06	479.000
o-Methoxy benzaldehyde	07	51.950
p-Methoxybenzyl alcohol (Anisyl alcohol)	07	52.000

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 4—Continued
Alphabetical chemical index

Chemical name	Sect. Item	
	No.	No.
o-Methoxy cinnamic aldehyde	07	52.100
2-Methoxyethanol (Ethylene glycol monomethyl ether)	15	1168.000
2-(2-Methoxyethoxy)ethanol (Diethylene glycol monomethyl ether)	15	1169.000
2-[2-(2-Methoxyethoxy)ethoxy]ethanol (Triethylene glycol monomethyl ether)	15	1170.000
2-(2-Methoxyethoxy)ethyl-2-methoxyethyl ether (Triethylene glycol dimethyl ether)	15	1171.000
2-Methoxyethyl acetate	15	1124.000
2-Methoxyethyl acrylate	15	1001.000
2-Methoxyethyl palmitate	11	99.000
2-Methoxynaphthalene	07	53.000
4-Methoxy-1-naphthol	14	361.000
N-(4-Methoxy-3-nitrophenyl)acetamide	03	1060.100
Methoxyphenamine hydrochloride	06	335.000
4-Methoxyphenol	15	109.000
(p-Methoxyphenyl)acetic acid	03	1063.000
N[4[1-[(2-Methoxyphenylamino)carbonyl]-2-oxopropylazophenyl]-4-[1[(2-methoxyphenylamino)carbonyl]-2-oxopropylazo]benzamide]	03	1063.023
1-p-Methoxyphenyl penten-1-one-3 (α -Methyl-arisalacetone)	07	53.400
3-(2-Methoxyphenyl)-2-propenal	07	76.700
Methoxypolyethylene glycol	15	1172.000
1-Methoxy-2-propanol	15	1173.000
2-Methoxy-4-propenylphenol (Isoeugenol)	07	54.000
2-Methoxy-4-propenylphenol, acetate	07	54.100
3-Methoxypropionitrile	15	448.200
3-(3-Methoxypropoxy)propanol	15	1174.000
3-[3-(3-Methoxypropoxy)propoxy]propanol	15	1175.000
3-Methoxypropylamine	15	417.000
2-Methoxy-4-propylphenol	07	54.150
Methscopolamine bromide	06	620.700
Methsuximide	06	421.000
Methyclothiazide	06	724.000
N-Methylacetamide	15	248.000
Methyl acetate	15	1002.000
Methyl acetoacetate	15	1003.000
4'-Methylacetophenone	07	55.000
Methyl acetylricinoleate	11	111.010
Methyl acrylate, monomer	15	1004.000
Methylal (Dimethoxymethane)	15	1320.000
Methyl alcohol, alkoxylated	12	730.700
Methylamine, mono-	15	290.000
2-Methylaminoethanol (N-Methylethanolamine)	15	419.000
p-Methylaminophenol sulfate (Metol)	14	362.000
Methyl 2-aminothiopolen-3-carboxylate	15	419.100

Chemical name	Sect. Item	
	No.	No.
Methyl (tri-hydrogenated tallow alkyl) ammonium chloride	12	498.900
Methyl amyl alcohol	15	862.999
2-(N-Methylanilino)ethanol	03	1070.000
3-(N-Methylanilino)propionitrile	03	1071.000
p-Methylanisole	07	56.000
Methyl anthranilate	07	57.000
2-Methylanthraquinone	03	1075.000
Methylaziridine	15	110.000
β -Methylbenzene propanal	07	57.070
Methylbenzene sulfonate	15	110.150
Methyl benzoate	07	57.100
Methyl-p-benzoquinone	15	110.200
2-Methylbenzothiazole	03	1078.000
o-Methylbenzoyl chloride	03	1078.700
α -Methylbenzyl acetate (Styralyl acetate)	07	58.000
N-Methylbenzylamine	03	1079.000
Methyl benzyl ether	03	1080.000
N-Methylbis(coconut oil alkyl)amine	12	441.000
N-Methylbis(hydrogenated tallow alkyl)amine	12	442.000
Methyl, bis-(2-hydroxyethyl) hydrogenated tallow alkylammonium chloride	12	465.120
Methyl, bis-(2-hydroxyethyl) isodecyloxypropylammonium chloride	12	465.135
Methyl, bis-(2-hydroxyethyl) isotridecyloxypropylammonium chloride	12	465.140
Methyl, bis-(2-hydroxyethyl) soyaalkylammonium chloride	12	465.160
N-methylbis[octyl-decyl]amine	12	442.100
Methyl bromide (Bromomethane)	13	240.000
2-Methyl-1-butanol	15	841.000
3-Methyl-1-butanol	15	841.001
3-Methyl-2-butenyl acetate	07	162.012
Methyl-1-(butylcarbonyl)-2-benzimidazolecarbamate (Benomyl)	13	24.900
Methyl-t-butyl ether	14	184.000
2-Methylbutyl isovalerate	07	162.015
Methyl p-tert-butyl phenylacetate	07	58.500
Methylbutyl pyrophosphate, ethylenedioxy titanium salt	12	100.200
Methyl butynol	07	162.020
Methyl caproate	07	162.456
Methyl carbamate	15	420.000
Methylcellulose	14	411.000
Methyl chloroformate	15	1008.000
2-(2-Methyl-4-chlorophenoxy)propionic acid, diethanolamine salt	13	118.056
2-(2-Methyl-4-chlorophenoxy)propionic acid, iso-octyl ester	13	118.057
α -Methylcinnamaldehyde	07	59.000

Table 4—Continued
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Chemical name	Sect. Item	
	No.	No.
Methyl cinnamate	07	60.000
6-Methylcoumarin	07	60.200
Methyl cyanoacetate	15	448.650
Methylcyclohexane	03	1083.000
2-Methylcyclohexylamine	15	111.100
1-(2-Methylcyclohexyl)-3-phenylurea (Siduron)	13	76.000
Methylcyclopentadiene	02	65.500
Methylcyclopentadienylmanganese tricarbonyl	14	185.000
2-Methyldecanal	07	162.458
Methyl 3-(2,2-dichloroethenyl)-2,2-dimethyl-3-cyano-3-phenoxyphenylcyclopropanecarboxylate	13	166.035
Methyl 5-(2',4'-dichlorophenoxy)-2-nitrobenzoate	13	76.050
Methyl 3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropane carboate	03	1084.150
Methyl didecylamine	12	442.800
Methyl dihydrogen phosphate	15	1034.000
5-Methyl-1,7-dihydroxy-1,3,4-triazalindolizine	14	366.000
Methyl N',N'-dimethyl-N-[(methylcarbamoyl)oxy]-1-thiooxamidate	13	231.010
Methyl 2-[[[(4,6-dimethyl-2-pyrimidinyl)amino]carbonyl]amino]sulfonyl]benzoate	13	118.055
2-Methyl-4,6-dinitrophenol (4,6-Dinitro-o-cresol)	03	1084.700
4-Methyl-2,6-dinitrophenol	03	1084.703
N-Methyldioctadecylamine	12	443.000
Methyl dioleyl ethoxy ammonium methyl sulfate	12	465.250
Methyl ditallowimidazolium methosulfate	12	476.500
N-Methyldithiocarbamic acid, potassium salt	13	187.012
N-Methyldithiocarbamic acid, sodium salt (Metham)	13	241.000
Methyldopa	06	358.000
2,2'-Methylenebis(6-tert-butyl-p-cresol)	09	90.000
2,2'-Methylenebis(6-tert-butyl-4-ethylphenol)	09	91.000
2,2'-Methylenebis(4-chlorophenol) (dichlorophene)	13	40.025
4,4'-Methylenebis(2,6-di-tert-butylphenol)	03	1088.100
4,4'-Methylenebis[N,N-diethylaniline]	03	1087.000
4,4'-Methylenebis[N,N-dimethylaniline] (Methane base)	03	1088.000
Methylenebis(thiocyanate)	13	195.010
2,2'-Methylenebis[3,4,6-trichlorophenol] (Hexachlorophene)	15	114.000
Methylene chloride (Dichloromethane)	15	1234.000
4,4'-Methylenedianiline	03	1091.000
1,2-Methylenedioxy-4-nitrobenzene	03	1091.500
1,2-Methylenedioxy-4-propylene benzene (IsoSafrole)	07	60.800
5,5'-Methylenedisalicylic acid	03	1092.000
Methyl esters of coconut oil	15	973.000
Methyl esters of lard	15	974.500
Methyl esters of tallow	15	975.000
N-Methyl-2-ethanolpiperidine	03	1092.100

Chemical name	Sect. Item	
	No.	No.
Methyl ether (Dimethyl ether)	15	1321.000
1-(2Methylethoxy)-4, methylbenzene	07	60.655
Methyl ethyl ketone	15	826.500
Methyl ethyl sulfide	02	93.800
Methyl formate	15	1010.000
Methyl formcel	15	1450.000
Methyl p-formylbenzoate	03	897.500
Methylglucoside dioleate	12	712.950
Methylglucoside, ethoxylated	12	712.970
Methylglucoside laurate	12	713.000
Methylglucoside, propoxylated	12	714.350
Methylglucoside sesquistearate	12	714.300
1-Methyl-2-(8-heptadecenyl)-1-(9-octadecenyl)amido ethyl	12	476.850
N-(1-Methylheptyl)ethanolamine	14	185.500
N-(1-Methylheptyl)-N'-phenyl-p-phenylenediamine	09	64.000
5-Methyl-2-hexanone (Methyl isoamyl ketone)	15	827.000
Methyl hexyl ether	07	162.480
p-Methylhydratropaldehyde	07	60.800
Methyl hydrazine, mono	15	424.200
Methylhydroquinone	03	1094.000
Methyl 12-hydroxystearate	15	976.000
4,4-Methylidene-bis-1(p-sulfophenyl)3-methylpyrazolone (2,4-Methyl-5-imidazolyl)methylthioethylamine dihydrochloride-	03	1094.853
2,2'-(Methylimino)diethanol (Methyldiethanolamine)	15	424.000
4-Methyl-2-imino-1,3-dithiolane hydrochloride	03	1094.880
Methylionone(α - and β -)	07	114.000
γ -Methylionone	07	114.100
6-Methyl- α -ionone	07	112.000
Methyl isobutyl ketone	15	828.000
Methylisobutyl ketone aminonitrile	15	448.800
Methyl isobutyrate	07	162.500
Methyl isocyanate	15	424.500
1-Methyl-isoheptyl-hexahydro benzaldehyde	07	61.100
Methyl iso-octadecenoate	15	977.500
Methyl isothiocyanate and 1,3-dichloropropene	13	243.012
Methyl isovalerate	07	162.520
2-Methylactonitrile (Acetone cyanohydrin)	15	449.000
Methyl linoleate	15	977.600
Methylmagnesium bromide	15	1376.000
Methylmagnesium chloride	15	1377.000
Methyl mercaptan (Methanethiol)	02	94.000
Methyl methacrylate-butadiene styrene (MBS) resins	08	44.041
Methyl methacrylate-2-ethyl hexyl	08	19.982
Methyl methacrylate, monomer	15	1011.000
N-Methyl-methanamine with borane (1:1)	15	1368.600
Methyl N-methylantranilate	07	62.000

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 4—Continued
Alphabetical chemical index

Chemical name	Sect. No.	Item No.
Methyl-2-methyl butyrate	07	162.550
S-Methyl-N-[(methylcarbamoil)oxy]thioacetimidate (Methomyil)	13	213.400
a-Methyl-3,4-methylene dioxyhydrocinnamaldehyde	07	62.200
4-Methyl-N-[(4-methylphenyl)sulfonyl]benzenesulfonamide	03	1096.200
2-Methyl-2-(methylthio)propionaldehyde O-(methylcarbamoil)oxime (Aldicarb)	13	213.500
4-Methylmorpholine	15	117.000
Methylnaphthalene	01	12.500
Methylnaphthalenesulfonic acid, sodium salt	12	173.000
N-Methyl-p-nitroaniline	03	1102.000
4-Methyl-2-nitroanisole	03	1104.000
3-Methyl-2-nitrobenzoic acid	03	1106.020
2-Methyl-2-nitro-1-propanol	15	426.000
3-Methyl-2-[and 3]nonene nitrile	07	162.750
Methyl nonen-3-oate	07	162.605
Methylnonylnaphthalenesulfonic acid, sodium salt	12	174.000
2-Methyl-5-norbornene-2,3-dicarboxylic anhydride	03	1108.000
1-methyl-2-nor-tallow-1-[2-tallow amidoethyl]imidazoliummethyl sulfate	12	476.880
Methyl oleate	11	94.000
Methyl oleate, sulfated, sodium salt	12	261.000
N-Methyl-N-oleoyltaurine, sodium salt	12	184.000
Methylol methyl hexyl ketone	07	162.700
m-(3-Methyl-5-oxo-2-pyrazolin-1-yl)benzenesulfonic acid	03	1111.000
4-[(3-Methyl-5-oxo-1-(4-sulfophenyl)-2-pyrazolin-4-ylidene)methylene]-3-methyl-1-(4-sulfophenyl)-2-pyrazolin-5-one	14	368.000
N-Methyl-N-palmitoyltaurine, sodium salt	12	185.000
2-Methyl-2,4-pentanediol (Hexylene glycol)	15	1089.000
2-Methyl-1-pentanol	15	863.000
4-Methyl-2-pentanol (1-Methylisobutylicarbinol)	15	864.000
4-Methyl-3-penten-2-one (Mesityl oxide)	15	829.000
N-(1-Methylpentyl)-N'-phenyl-p-phenylenediamine	09	64.200
Methyl pentynol	07	162.660
Methylphenidate hydrochloride	06	545.700
Methyl phenylacetate	07	63.000
2-Methyl-5-phenylbenzoxazole	03	1114.502
3-Methyl-5-phenyl-1-pentanol	07	63.200
4-Methyl-1-phenyl-3-pyrazolidone	14	369.000
Methyl phenyl sulfide (Thioanisole)	03	1119.000
1-Methyl-3-phenyl-5-[3-(trifluoromethyl)phenyl]-4(1H)-pyridone (Fluridone)	13	118.063
4-Methylphthalic acid	03	1120.502
4-Methylphthalic anhydride	15	118.700
N-Methylphthalimide	03	1120.550
4-(4'-Methylpiperidine)pyridine	03	1121.400

Chemical name	Sect. No.	Item No.
3-(2-Methylpiperidino)propyl-3,4-dichlorobenzoate (Pipron)	13	40.026
N-Methyl-N-polyoxyethylene-N,N-bis(hydrogenated tallow amidoethyl) ammonium	12	476.920
N-Methyl-N-polyoxyethylene-N,N-bis(tallow amidoethyl)	12	476.925
Methylprednisolone	06	663.000
2-Methyl-2-propanamine with borane(1:1)	15	1368.700
Methyl propionate	07	162.665
Methylpseudolonone	15	830.000
Methyl pseudolonone	07	114.300
1-Methyl-2-pyrrolidone, monomer	15	120.000
Methyl ricinoleate	11	110.000
Methyl salicylate	07	64.000
Methyl stearate	15	978.000
α-Methylstyrene	03	1125.000
ar-Methylstyrene (Vinyltoluene)	03	1125.100
α-Methyl styrene polymers	08	45.000
Methyl sulfate (Dimethyl sulfate)	15	1013.000
Methyl sulfide (Dimethyl sulfide)	15	1354.000
Methyl sulfoxide (Dimethyl sulfoxide)	15	1355.000
N-Methyl-N-(tall oil acyl)taurine, sodium salt	12	186.000
Methyl-1-tallowamidoethyl-2-tallowimidazolium-methyl sulfate	12	498.700
Methylallowdiethylenetriamine condensate, polyethoxylated, methyl sulfate	12	465.200
Methylallowdiethylenetriamine condensate, polypropoxylated, methyl sulfate	12	465.210
Methyltestosterone	06	641.200
2-Methylthiazoline	14	363.000
Methyl thiobutyrate	07	162.800
Methyl-2-thiofuroate	07	114.400
Methyl thioglycolate	15	1013.400
Methylthiosulfonic acid, S-(2-hydroxypropyl) ester	13	205.925
Methyl tri(C ₈₋₁₀) ammonium chloride	12	499.900
5-Methyl-1,2,4-triazolo[3,4-b]benzothiazole (Tricyclazole)	13	40.027
Methyltrimethoxysilane and polymethyltrisiloxane	15	1390.000
Methyltrioctylammonium chloride	12	499.000
2-Methylundecanal	07	163.000
2-Methyl undecanal dimethylacetal	07	163.050
Methyl vinyl ether	15	1322.000
Methyprylon	06	474.000
Metoclopramide hydrochloride	06	81.300
Metolazone	06	739.600
Metoprolol tartrate	06	358.300
Metyrapone	06	578.000
Mexadecyl sulfate, monoethanolamine salt	12	229.900

APPENDIX D

Table 4—Continued
Alphabetical chemical index

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Chemical name	Sect. Item	
	No.	No.
Mexane-1,6-bis(tributyl ammonium bromide)	12	497.500
Mexylisonanylamidocarboxylic acid, monoethanolamine salt .	12	26.150
Mink amidopropyl dimethyl amine (amine acid ratio=1/1)	12	564.450
Minocycline	06	35.000
Minoxidil	06	358.400
Miscellaneous acyclic chemicals, all other	15	1423.000
Mixed acyclic primary amines, ethoxylated and sulfated, sodium salt	12	14.000
Mixed alcohol borates	15	1368.720
Mixed alcohols, ethoxylated	12	762.000
Mixed alkanesulfonic acid	12	211.000
Mixed alkane sulfonic acid, sodium salt	12	212.000
3-(Mixed alkoxy)propylamine, ethoxylated oxides	12	330.950
(Mixed alkyl)amine	12	423.000
(Mixed alkyl)amine, ethoxylated	12	331.000
(Mixed alkyl)amine phosphate	12	394.700
(Mixed alkyl)ammonium chloride	12	499.500
(Mixed alkyl)dibenzyltrimethyl-1,3-propane diammonium chloride	12	527.580
Mixed alkyl imidazoline derivative, ethoxylated	12	465.300
(Mixed alkyl)phenol, alkoxyated	12	745.900
(Mixed alkyl)phenol alkylenediaminealkanolamine formaldehyde	12	782.950
(Mixed alkyl)phenol epichlorohydrin-formaldehyde, alkoxyated	12	722.100
(Mixed alkyl)phenol, ethoxylated	12	746.000
(Mixed alkyl)phenol, ethoxylated and sulfated, sodium salt	12	286.000
(Mixed alkyl)phenol-formaldehyde, alkoxyated	12	722.000
(Mixed alkyl)phenol formaldehyde, methoxyated	12	722.015
Mixed alkyl phenol sulfate, ethoxylated, triethanolamine salt	12	244.300
Mixed alkyl phosphate, sodium salt	12	102.100
Mixed alkyl phosphate	12	101.000
Mixed alkyl phosphate, alkylamine salt	12	101.500
Mixed alkyl phosphate, diethanolamine salt	12	102.000
Mixed alkyl phosphate, potassium salt	12	102.050
Mixed alkyl phosphate, triethanolamine salt	12	102.120
N-(Mixed alkyl)polyethylenepolyamine	12	412.000
Mixed tert-alkyl primary amines, ethoxylated	12	331.500
Mixed alkyl stearate	12	714.520
(Mixed alkyl)sulfobetaine	12	15.000
Mixed aryl dimides	14	167.000
Mixed p-tert-butylphenol formaldehyde terpolymer	12	722.200
Mixed carboxylic acids	12	536.450
Mixed carboxylic acids	12	547.850
Mixed chain length fatty acid, synthetic	15	1438.000

Chemical name	Sect. Item	
	No.	No.
Mixed(coco and soya fatty acids), reaction products with chloromethane and diethylenetriamine, ethoxylated, quaternized	12	477.220
Mixed dialkyl hydrogen phosphates, amine salts	15	1034.502
Mixed di and triethylene glycol mono ester of tall oil acid	12	714.600
Mixed ester of resin and rosin acids	12	660.450
Mixed fatty acid amide with diethylene triamine/ethyl sulfate	12	477.226
Mixed fatty acid-ethoxylated nonyl phenol ester	12	783.500
Mixed fatty acids-alkylenediamine condensate, polyethoxylate	12	377.000
Mixed fatty acids camine/acid ratio=1/1	12	547.855
Mixed fatty acids, diethanolamine condensate	12	578.800
Mixed fatty acids, neutralized	12	536.570
Mixed fatty acids-polyalkylenepolyamine condensate	12	361.000
Mixed fish oils, sulfated, ammonium salt	12	299.990
Mixed fish oils, sulfated, sodium salt	12	300.000
Mixed higher glycol amine (MHGA)	15	395.200
Mixed linear alcohols, alkoxyated, all other	12	741.000
Mixed linear alcohols, alkoxyated	12	736.950
Mixed linear alcohols, alkoxyated and phosphated, potassium salt	12	87.007
Mixed linear alcohols, ethoxylated	12	737.000
Mixed linear alcohols, ethoxylated, benzyl ether	12	737.100
Mixed linear alcohols, ethoxylated and carbonated, sodium salt	12	318.500
Mixed linear alcohols, ethoxylated and phosphated	12	87.000
Mixed linear alcohols, ethoxylated and phosphated, sodium salt	12	87.010
Mixed linear alcohols, ethoxylated and propoxyated	12	738.000
Mixed linear alcohols, ethoxylated and sulfated, ammonium salt	12	276.000
Mixed linear alcohols, ethoxylated and sulfated, diethanolamine salt	12	276.500
Mixed linear alcohols, ethoxylated and sulfated, sodium salt	12	278.000
Mixed linear alcohols, polyoxalkylated and phosphated	12	87.025
Mixed linear alcohols, sulfated, ammonium salt	12	232.000
Mixed linear alcohols, sulfated, diethanolamine salt	12	232.200
Mixed linear alcohols, sulfated, magnesium salt	12	232.400
Mixed linear alcohols sulfated, mixed sodium/cocodiol ethanolamine salts	12	232.520
Mixed linear alcohols, sulfated, sodium salt	12	233.000
Mixed linear alcohols, sulfated, triethanolamine salt	12	233.100
(Mixed linear alkyl)dimethyl ammonium methyl sulfate	12	500.100
Mixed linear alkylpoly(ethyleneoxy)ethyl chloride	12	738.100

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 4—Continued
Alphabetical chemical index

Chemical name	Sect. Item	
	No.	No.
(Mixed linear alkyl)trimethyl ammonium bromide	12	500.500
Mixed oleic, lauric, stearic, and palmitic hexaglycerol esters	12	692.000
Mixed polyesters	14	284.000
Mixed (secondary linear alcohol)polyethylene propionic acid, sodium salt	12	45.700
Mixed tall oil and rosin acids, ethoxylated	12	671.300
Mixed tridecyl alcohol and 2-ethylhexanol, phosphated, potassium salt	12	87.050
Mixed vegetable fatty acids, potassium salt	12	59.000
Mixed vegetable fatty acids, sodium salt	12	58.990
Mixed vegetable oils, sulfated, sodium salt	12	308.000
Mixed vegetables acids	12	547.870
Mixture of N-octyl, N-decyl, N,N-dimethyl ammonium chloride and benzyl, dimethyl, (mixed alkyl) ammonium chloride	12	499.600
Mixtures not specifically itemized, all other	15	1500.000
Modified rosin (unesterified)	08	41.000
Modified rosin esters	08	40.000
Molindone hydrochloride	06	505.000
Monesin	06	68.000
Mono-Dodecyl biphenyl (mixed isomers)	03	870.250
Monoethanolamine	15	379.000
Monohydric alcohol esters, all other	15	1070.000
Monoisopropylamine	15	407.000
Monomethyl tin	15	1404.877
Mordant Black 9	04	887.000
Mordant Black 11	04	888.000
Mordant Brown 1	04	871.000
Mordant Brown 18	04	875.000
Mordant Brown 40	04	879.000
Mordant Brown 70	04	882.000
Mordant Orange 1	04	848.000
Mordant Orange 6	04	850.000
Mordant Red 7	04	855.000
Mordant Red 9	04	856.000
Mordant Red 11	04	857.000
Mordant Yellow 1	04	836.000
Mordant Yellow 8	04	839.000
Mordant Yellow 20	04	842.000
Morphine sulfate	06	405.500
Morpholine	15	121.000
Morpholine residue stream	15	1440.000
Morpholine salt of p-toluene sulfonic acid	15	122.000
N-Morpholinyl-2-benzothiazoyl disulfide	09	33.000
p-Morpholinyl-2,5-dibutoxybenzene diazonium chloride	14	370.000
Moxalactam	06	51.500

Chemical name	Sect. Item	
	No.	No.
Mustard seed oil, sulfated, sodium salt	12	309.000
Myrcene	15	1343.000
Myrcenyl acetate	07	163.800
Myristaldehyde	07	164.000
Myristic acid	12	572.000
Myristic acid (Ratio=1/1)	12	547.900
Myristyl alcohol, propoxylated	12	738.300
Myristylbenzyltrimethylammonium chloride.2H ₂ O	03	1418.000
Myristyl ethoxy myristate	11	88.600
Myristyl lactate	15	1015.000
Myristyl myristate	15	979.000
Myristyl stearate	11	124.525
Nadolol	06	358.500
Nafcillin, sodium	06	17.000
Naphazoline hydrochloride	06	336.000
1-Naphthaldehyde	03	1133.800
Naphthalene	02	17.000
1-Naphthaleneacetic acid, sodium salt	13	168.900
Naphthalene, crude, solidifying at less than 74° C.	01	12.000
Naphthalene, crude, solidifying at 76° C to less than 79° C	01	14.000
1,5-Naphthalenedisulfonic acid, 2-amino-, monosodium salt	03	1138.500
Naphthalenesulfonates, all other	12	176.000
Naphthalenesulfonic acid, ammonium salt	12	174.200
1-Naphthalenesulfonic acid, formaldehyde condensate and salt	14	465.000
2-Naphthalenesulfonic acid, formaldehyde condensate and salt	14	466.000
1-Naphthalenesulfonic acid, 8-(phenylamino)-monosodium salt	03	1308.500
Naphthalene sulfonic acid polymer with formaldehyde and 4,4'-dihydroxy diphenyl phenol, ammonium salt	12	783.700
Naphthalene sulfonic acid, polymer with formaldehyde and 4,4'-dihydroxydiphenyl sulfone	12	722.445
1-Naphthalenesulfonic acid, sodium salt	03	1142.000
2-Naphthalenesulfonic acid, sodium salt	03	1143.000
Naphthalene sulfonic acid, sodium salt, formaldehyde condensate	12	174.500
1,4,5,8-Naphthalenetetracarboxylic acid	03	1145.000
Naphthalimide	03	1148.000
Naphthenate driers, mixed salts	14	310.000
Naphthenic acid, acid number 150-199	02	19.000
Naphthenic acid, acid number 200-224	02	20.000
Naphthenic acid, acid number 225-249	02	21.000
Naphthenic acid, acid number less than 150	02	18.000
Naphthenic acid, copper salt	13	26.000

Table 4—Continued
Alphabetical chemical index

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Chemical name	Sect. Item	
	No.	No.
Naphthenic acid, ethoxylated	12	45.800
Naphthenic acid, potassium salt	12	59.500
Naphthenic acids-polyalkylene polyamine condensate	12	361.150
Naphthenic acids-tall oil fatty acids-polyalkylene polyamine condensate	12	361.200
1-Naphthol (α -Naphthol)	03	1150.000
1-Naphthol, ethoxylated and sulfated, free acid	12	286.090
Naphthol reds, all other	05	46.000
Naphth[1,2-d] [1,2,3]oxadiazole-5-sulfonic acid	03	1157.000
1-Naphthylamine (α -Naphthylamine)	03	1158.000
p-(2-Naphthylamino)phenol (N-(p-Hydroxyphenyl)-2-naphthylamine)	03	1160.000
α -Naphthyl-dodecyl-dimethyl ammonium chloride	12	527.650
1-Naphthyl N-methylcarbamate (Carbaryl)	13	150.000
N-1-Naphthylphthalamic acid (NPA)	13	77.900
Naphthalene sulfonic acid, polymer with formaldehyde and 4,4'-dihydroxydiphenyl sulfone, ammonium salt (NBR) type	12	722.450
Neat's foot oil, sulfated, sodium salt	10	12.000
Neat's foot oil, sulfated, sodium salt	12	294.000
Neoalkoxy, dodecylbenzene-sulfonyl titanate	12	137.500
Neoalkoxy, tri(m-amino)-phenyl titanate	12	331.850
Neoalkoxy, trineodecanoyl titanate	12	59.600
Neoalkoxy, trineodecanoyl zirconate	12	59.620
Neoalkoxy, tris(m-amino) phenyl zirconate	12	331.890
Neoalkoxy tris(dioctyl) phosphato zirconate	12	102.500
Neoalkoxy tris(dioctyl) pyrophosphato zirconate	12	102.550
Neoalkoxy, tris (ethylene diamino) zirconate	12	331.870
Neodecanolic acid	15	556.000
Neodecanoyl chloride	15	557.000
Neohexanoyl chloride	15	557.100
Neohexane (2,2-Dimethylbutane)	02	67.000
Neomycin (medicinal grade)	06	52.000
Neomycin (animal feed grade)	06	69.000
Neopentyl glycol adipate	11	64.500
Neopentyl glycol dioleate	11	94.250
Neopentyl glycol glutarate	11	85.650
Neophyl chloride	15	1239.810
Neostigmine methylsulfate	06	317.000
Netilmicin	06	62.001
Niacin (animal feed grade)	06	778.000
Niacinamide (medicinal grade)	06	780.500
Niacinamide hydrochloride	06	781.000
Nickel acetate	15	601.000
Nickel 2-ethylhexanoate	15	640.000
Nicotinonitrile (3-Cyanopyridine)	03	1162.000
Nifedipine	06	374.200
Nikethamide	06	547.000

Chemical name	Sect. Item	
	No.	No.
3-Niro-6-pyrrolodinytoluene	03	1237.500
Nitarsons	06	158.000
Nitrated lard oil	15	431.000
Nitriles, all other	15	457.000
Nitriloacetic acid, zinc salt	14	85.000
Nitrilotriacetic acid	14	78.000
Nitrilotriacetic acid, trisodium salt	14	81.000
Nitrilotriacetoneitrile	15	449.850
Nitrilo-tris-methylene triphosphonic acid	14	82.000
Nitrilo-tris-methylene triphosphonic acid, potassium	14	83.000
Nitrilo-tris-methylene triphosphonic acid, sodium salt	14	84.000
3'-Nitroacetanilide	03	1164.000
o-Nitroaniline	03	1172.000
p-Nitroaniline	03	1173.000
5-Nitroanthranillic acid	03	1184.000
1-Nitroanthraquinone	03	1185.000
p-Nitrobenzamide	03	1187.503
Nitrobenzene	03	1190.000
m-Nitrobenzenesulfonic acid, sodium salt	03	1195.000
6-Nitrobenzimidazole	14	371.000
5-Nitrobenzimidazole nitrate	14	372.000
o-Nitrobenzoic acid	03	1200.503
m-Nitrobenzoic acid	03	1200.000
p-Nitrobenzoic acid	03	1201.000
m-Nitrobenzoic acid, sodium salt	03	1205.000
2-Nitro-N-benzoylaniline	03	1205.603
2-Nitro-p-cresol	03	1210.000
Nitrodiphenylamine	03	1212.000
Nitroethane	15	459.000
Nitrogenous compounds, acyclic, all other	15	484.000
5-Nitroisophthalic acid	03	1215.000
Nitromethane	15	460.000
3-Nitro-4-methylacetophenone	03	1215.350
4-Nitro-N-methylphthalimide	03	1215.400
Nitromide	06	182.000
1-Nitronaphthalene	03	1216.000
7 (and 8)-Nitronaphth[1,2-d] [1,2,3]oxadiazole-5-sulfonic acid	03	1221.000
p-Nitrophenethyl alcohol	03	1224.000
o-Nitrophenol	03	1227.000
p-Nitrophenol	03	1228.000
p-Nitrophenol, sodium salt	03	1229.000
2-(o-Nitrophenylazo)-4,6-di-tert-pentylphenol (OH=1)	03	1231.300
2-(p-Nitrophenyl)-2H-naphtho[1,2-d]triazole-6,8-disulfonic acid	03	1234.000
1-Nitropropane	15	461.000
2-Nitropropane	15	462.000

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 4—Continued
Alphabetical chemical index

Chemical name	Sect. Item	
	No.	No.
5-Nitrosalicylaldehyde	03	1238.000
p-Nitrosophenol	03	1240.000
4-Nitrosophenol, sodium salt	03	1240.100
N-Nitrosophenyhydroxylamine salt	15	122.450
o-Nitrotoluene	03	1244.000
m-Nitrotoluene	03	1243.000
p-Nitrotoluene	03	1245.000
Nitrotoluene mixtures	03	1246.000
p-Nitrotoluene-o-sulfonic acid	03	1247.300
Nizatidine	06	620.800
Nonanal	07	165.000
n-Nonane	15	1344.000
1,3-Nonanediol acetate	07	165.200
1,3-Nonanediol diacetate	07	165.210
Nonanoic acid (Pelargonic acid)	15	559.000
Nonene (Tripropylene)	02	80.000
Nonenylsuccinic anhydride	15	560.000
Nonionic surface-active agents, all other	12	787.000
Non-nylon type, polyamide resins	08	27.000
Nonyl acetate	07	165.500
Nonyldiphenylamine mixture (Mono-, di-, and tri-)	09	76.700
Nonylenic acid	07	165.600
tert-Nonyl mercaptan	09	171.250
Nonylphenol	03	1262.000
Nonylphenol, barium salt	14	229.000
Nonylphenol/diethylenetriamine blend	12	81.960
Nonylphenol, ethoxylated	12	749.000
Nonylphenol, ethoxylated and carbonated, sodium salt	12	318.640
Nonylphenol, ethoxylated and phosphated	12	82.000
Nonylphenol, ethoxylated and phosphated, diethanolamine salt	12	83.100
Nonylphenol, ethoxylated and phosphated, partial sodium salt	12	83.010
Nonylphenol, ethoxylated and phosphated, sodium salt	12	83.200
Nonylphenol, ethoxylated, phosphate esters	12	750.010
Nonylphenol, ethoxylated and propoxylated	12	750.000
Nonylphenol, ethoxylated and sulfated, ammonium salt	12	287.000
Nonylphenol, ethoxylated and sulfated, sodium salt	12	288.000
Nonyl phenol, ethoxylated with mixed fatty acids	12	750.050
Nonyl phenol ethoxylate, oleate	12	714.650
Nonylphenol-formaldehyde, alkoxylated	12	723.000
p-Nonylphenol formaldehyde copolymer, ethoxylated, propoxylated	12	723.100
Nonyl phenol oleate, ethoxylated	12	749.500
Nonylphenyl phosphites, mixed	09	85.000
Nopol	07	114.950
Nopyl acetate	07	115.000

Chemical name	Sect. Item	
	No.	No.
2-Nor tall oil alkyl-1-tall oil amidoethyl imidazoline	12	361.500
2-Nor-tall oil alkyl-1-tall oil amido-ethyl imidazoline	12	361.050
Nortriptyline hydrochloride	06	531.000
Noscapine	06	434.500
Novobiocin (animal feed grade)	06	70.000
Novobiocin, sodium	06	53.000
Nylon 6 (Polymer for fiber, only)	14	388.000
Nylon 6/6	14	389.000
Nylon type, polyamide resins	08	26.000
Nystatin (medicinal grade)	06	3.000
Ocimene	07	165.700
Octabromodiphenyl oxide	15	122.500
Octachlorohexahydro-4,7-methanoindene (Chlordan)	13	143.000
n-Octadecane	15	1346.000
1-Octadecanol (Stearyl alcohol)	15	877.000
cis-9-Octadecen-1-ol (Oleyl alcohol)	15	878.000
9-Octadecenyl acetate, sulfated, sodium salt	12	267.800
9-Octadecenyl alcohol, ethoxylated	12	731.000
9-Octadecenyl alcohol, ethoxylated and phosphated	12	84.000
9-Octadecenylamine	12	424.000
(9-Octadecenyl)amine, ethoxylated	12	332.000
Octadecenyl succinic anhydride	15	123.100
N-(9-Octadecenyl)trimethylenediamine	12	413.000
Octadecyl alcohol, ethoxylated	12	732.000
9-Octadecyl alcohol, ethoxylated and phosphated	12	84.200
Octadecylamine	12	425.000
Octadecylamine acetate	12	396.000
Octadecylamine, ethoxylated	12	333.000
Octadecyl-3-(3,5-di-tert-butyl-4-hydroxyphenyl) propionate	15	124.000
Octadecyl-3-mercaptopropionate	15	1016.000
N-Octadecylsulfosuccinamic acid, disodium salt	12	179.000
Octanal	07	166.000
n-Octane	15	1348.000
n-Octane	02	75.000
n-Octanesulfonic acid, sodium salt	12	212.100
Octanoic acid (Caprylic acid) salts, all other	15	716.000
1-Octanol	15	866.000
2-Octanol (sec-Capryl alcohol)	15	867.000
2-Octanone (Hexyl methyl ketone)	15	831.000
3-Octanone (Ethyl amyl ketone)	07	166.200
Octanoyl chloride	15	561.000
2-Octanyhydroquinone	15	124.600
Octenes, mixed	02	75.700
Octenylsuccinic anhydride	15	104.100
N-Octyl acetate	07	166.300
tert-Octylamine	15	293.100

APPENDIX D

Table 4—Continued
Alphabetical chemical index

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Chemical name	Sect. Item	
	No.	No.
n-Octylamine, mono	15	293.000
Octyl chloride	15	1241.000
n-Octyl n-decyl adipate	11	65.000
Octyl decyl dimethyl ammonium chloride	12	500.700
N-Octyl, N-decyl, N,N-dimethyl ammonium chloride	12	483.200
n-Octyl n-decyl phthalate	11	49.000
2-Octyldecyl-12-stearoyl stearate	11	124.540
Octyldimethyl-p-aminobenzoate	03	1264.500
Octyldiphenylamine	09	77.000
Octyldiphenylamine, alkylated	09	78.000
Octyl diphosphate, oxoethylene titanium salt	12	104.600
Octyl formate	07	166.355
n-Octylglucamine	03	1264.050
Octyl isobutyrate	07	166.358
2-n-Octyl-4-isothiazolin-3-one	13	25.500
Octyl isovalerate	07	166.360
n-Octyl mercaptan	09	171.400
Octyl mercaptans	02	95.010
3-Octyloxy and 3-dicyloxy-propylamine	12	333.100
Octylphenol	03	1265.000
n-Octylphenol, ethoxylated	12	752.000
Octylphenol, ethoxylated and benzylated	12	752.005
Octylphenol, ethoxylated and phosphated	12	85.000
Octylphenol, ethoxylated and phosphated, magnesium salt	12	86.000
n-Octylphenol, ethoxylated and sulfonated, sodium salt	12	208.000
tert-Octylphenol-formaldehyde, ethoxylated	12	724.000
Octylphenoxy polyethoxy ethyl sulfate	12	290.100
Octyl phosphate, alkylamine salt	12	106.000
Octyl phosphate, ethoxylated	12	784.000
Octyl phosphate, isoproxy titanium salt	12	106.400
Octyl phosphate neoalkoxy titanium salt	12	106.700
Octyl phosphate, potassium salt	12	107.000
Octyl polyphosphate	12	108.000
Octyl pyrophosphate, ethylenedioxy titanium salt	12	110.100
Octyl pyrophosphate, ethylenedioxy titanium salt/dimethylamino methacrylate salt	12	110.110
Octyl pyrophosphate, isoproxy titanium salt	12	110.150
Octyl pyrophosphate neoalkoxy titanium salt	12	110.160
Octyl pyrophosphate, oxoethylenedioxy titanium salt	12	110.170
Octyl pyrophosphate titanium salt	12	110.200
Octyl sulfate, sodium salt	12	238.000
Octyltin	15	1404.900
Oil-soluble petroleum sulfonate, all other	14	217.000
Oil-soluble petroleum sulfonate, ammonium salt	14	211.000
Oil-soluble petroleum sulfonate, barium salt	14	212.000
Oil-soluble petroleum sulfonate, calcium salt	14	213.000
Oil-soluble petroleum sulfonate, magnesium salt	14	214.000

Chemical name	Sect. Item	
	No.	No.
Oil-soluble petroleum sulfonate, sodium salt	14	215.000
Oleamide (Octadecene amide)	15	250.000
Oleamidopropylidimethyl amine	12	387.500
Oleamidulosufosuccinamic acid, disodium salt	12	179.900
Oleic acid (Ratio = 1/1)	12	548.000
Oleic acid (Ratio = 2/1)	12	538.000
Oleic acid	15	563.000
Oleic acid aminoethylethanolamine-condensate [amine/acid ratio=1/1]ethyl sulfate	12	575.410
Oleic acid, ammonium salt	12	59.800
Oleic acid-diethylenetriamine condensate	12	363.000
Oleic acid-N,N-dimethyltrimethylenediamine condensate	12	365.000
Oleic acid, epoxidized, ammonium salt	12	59.900
Oleic acid esters, all other	11	96.000
Oleic acid-ethanolamine condensate, ethoxylated	12	579.000
Oleic acid, ethoxylated	12	671.500
Oleic acid-ethylenediamine condensate, propoxylated and sulfated, sodium salt	12	16.000
Oleic acid, mixed isopropanolamine salt	12	30.400
Oleic acid, morpholine salt	12	30.500
Oleic acid, potassium salt	12	60.000
Oleic acid, sodium salt	12	61.000
Oleic acid, sulfated	12	261.600
Oleic acid, sulfated, disodium salt	12	261.700
Oleic acid, sulfated, sodium salt	12	261.800
Oleic acid, triethanolamine salt	12	31.000
N-Oleic-linoleic, 1-3,propylene diamine	12	413.200
Oleotrile (Octadecene nitrile)	15	450.000
N-(Oleoyloxyisopropyl)sulfosuccinamic acid	12	180.000
Oleoylpalmitamide	15	251.000
Oleyl acid phosphate	14	209.000
Oleyl alcohol, ethoxylated	12	732.100
Oleyl alcohol, ethoxylated and phosphated	12	87.500
Oleylamine, ethoxylated	12	333.500
Oleyl betaine	12	16.100
Oleyl oleate	11	94.500
Oleyloxyethylidamide oxypropanol sulfonic acid	12	212.200
Oleyl sulfate, sodium salt	12	238.200
Olive oil acids, sodium salt	12	62.000
Organo-aluminum compounds, all other	15	1367.000
Organo-boron compounds, all other	15	1371.000
Organophosphorus insecticides, acyclic, all other	13	229.000
Organophosphorus insecticides, cyclic, all other	13	165.000
Organo-silicone compounds, all other	15	1399.000
Organo-tin compounds, all other	15	1407.000
Ormetoprim	06	265.500
Orphenadrine citrate	06	479.500

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 4—Continued
Alphabetical chemical index

Chemical name	Sect. Item	
	No.	No.
Other acyclic peroxides	15	1296.550
Other copolymer resins of acrylic and/or methacrylic acid esters	08	20.000
Other ethylene copolymer resins	08	31.800
Other homopolymer resins of acrylic and/or methacrylic acid esters	08	20.050
Other hydrolytic enzymes	14	120.000
7-Oxabicyclo-[2.2.1]-heptane-2,3-dicarboxylic acid, disodium salt (Endothall)	13	83.000
Oxalic acid, sodium	06	18.000
Oxalic acid salts, all other	15	727.000
Oxalyl bis(benzylidene hydrazide)	15	125.490
Oxamide	15	251.250
Oxidate light end	15	1457.000
Oxidized Fischer-Tropsch wax	15	566.000
Oxidized hydrocarbon mixture	14	218.000
Oxalcohol bottoms, sulfated, sodium salt	12	238.500
3-Oxo-1,2-benzisothiazoline-2-acetic acid, methyl ester, 1,1-dioxide	03	1272.000
5-Oxo-1-phenyl-2-pyrazoline-3-carboxylic acid, ethyl ester	03	1273.000
Oxtriphylline	06	745.800
Oxyaluminum benzoate	03	1275.700
Oxy-aluminum octanoate	15	1363.200
p,p'-Oxybis(benzenesulfonhydrazide)	09	109.000
Oxybutynin chloride	06	301.500
Oxycodone hydrochloride	06	406.000
4,4'-Oxydianiline	03	1275.000
N-Oxydiethylene-2-benzothiazolesulfenamide	09	34.000
N-Oxydiethylenethiocarbonyl-N'-oxydiethylenesulfenamide	09	34.100
Oxygen-containing quaternary ammonium salts (except those having amide linkages), all other	12	467.000
Oxyphenacylimine hydrochloride	06	302.000
Oxyquinoline benzoate (Benoxiquine)	06	268.000
Oxyquinoline sulfate	06	270.000
Oxytetracycline (medicinal grade)	06	36.000
Oxytetracycline (animal feed grade)	06	72.000
Paint dryers, naphthenic acid salts, all other	14	316.000
Palmitic acid esters, all other	11	101.000
Palmitic and stearic acids (Ratio = 2/1)	12	540.000
Palmitic and stearic acids (Ratio = 1/1)	12	549.000
Palmitoyl chloride	15	567.000
Palmitylamidopropylidimethyl amine	12	387.600
Palmityl octanoate	11	89.500
Palm kernel oil acids, potassium salt	12	62.890
Palm kernel oil acids, sodium salt	12	62.900
Palm oil acids, sodium salt	12	63.000

Chemical name	Sect. Item	
	No.	No.
Panthenol	06	790.000
Papain	14	102.000
para-Cymene	07	95.400
n-Paraffins, other	02	85.000
n-Paraffins, C ₁₀ -C ₁₄	02	84.000
n-Paraffins, C ₁₀ -C ₁₈	02	84.250
n-Paraffins, C ₁₂ -C ₁₈	02	84.260
n-Paraffins, C ₉ -C ₉	02	81.000
n-Paraffins, C ₉ -C ₁₅	02	83.000
Paraformaldehyde	15	1176.500
Parahydroxyphenylglycine potassium methyl diane salt	03	1121.650
para-Pentyloxyphenol	03	1277.300
Peanut oil, sulfated, sodium salt	12	310.000
Pecan oil, sulfated, sodium salt	12	309.900
Pectinase	14	116.000
Pelargonic acid (Ratio = 2/1)	12	541.000
Pelargonic acid esters, all other	11	101.500
Pelargonic acid-tetraethylenepentamine condensate	12	366.000
Pemoline	06	547.500
Penicillin V	06	26.000
Penicillin G, benzathine	06	21.000
Penicillin G, potassium	06	22.000
Penicillin V, potassium	06	29.000
Penicillin G, procaine (animal feed grade)	06	74.000
Penicillin G, procaine (medicinal grade)	06	23.000
Pentabromochlorocyclohexane	03	1275.300
Pentabromoethylbenzene	03	1275.352
Pentachlorophenol, sodium salt	13	29.000
Pentaerythritol	15	1091.000
Pentaerythritol caprylate/caprinate	15	1127.002
Pentaerythritol esters	14	286.000
Pentaerythritol phosphate	12	110.230
Pentaerythritol stearate	15	1129.000
Pentaerythritol stearate	12	715.100
Pentaerythritol tetraacrylate	15	1130.000
Pentaerythritol tetrakis (3-Mercaptopropionate)	15	1131.000
Pentaerythritol tribenzoate	15	125.700
Pentaethylenehexamine	15	294.000
Pentahydroxypropyl diethylenetriamine	15	467.200
1,1,3,3-Pentamethyl-3-acetoxydisiloxane	15	1394.500
1,1,3,3,5-Pentamethyl-4,6-dinitroindan (Moskene)	07	64.900
1,1,3,3,5-Pentamethylindan	03	1277.000
N,N,N',N',N'-Pentamethyl-N-(tallow alkyl)trimethylene-bis[ammonium chloride]	12	501.000
Pentamidine isethionate	06	270.700
n-Pentane	02	55.000
2,4-Pentanedione (Acetylacetone)	15	833.000

Table 4—Continued
Alphabetical chemical index

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Chemical name	Sect. Item	
	No.	No.
1-Pentanol	15	843.000
3-Pentanone (Diethyl ketone)	15	835.000
Pentazocine	06	416.001
Pentazocine hydrochloride	06	416.003
2-Pentenal	07	166.363
2-Pentene	02	57.000
Pentenenitrile	15	450.400
Pentenes, mixed	02	58.000
Pentobarbital	06	456.000
150-pentyl acetoacetate	07	158.900
Pentylamine, mono-	15	296.000
α -Pentylcinnamaldehyde	07	65.000
<i>o</i> -Pentylphenol (<i>o</i> -Amylphenol)	03	1279.000
<i>p</i> -tert-Pentylphenol	03	1279.100
Pepsin	14	103.000
Perchloroethylene (Tetrachloroethane)	15	1243.000
Perchloromethanethiol (Perchloromethyl mercaptan)	15	1410.000
Perfluoropropionic anhydride	15	567.600
Permethrin acid chloride	03	1279.600
Peroxyacetic acid	15	568.000
Perphenazine	06	486.000
3,4,9,10-Perylenetetra-carboxylic-3,4:9,10-dianhydride	03	1280.503
3,4,9,10-Perylenetetra-carboxylic-3,4:9,10-dimide	03	1281.000
Perylo[3,4-cd:9,10-c'd']dipyran-1,3,8,10-tetrone	03	1281.400
Pesticides and related products, acyclic, all other	13	245.000
Petroleum hydrocarbon resins	08	24.000
Petroleum sulfonic acid, calcium salt	12	207.090
Petroleumsulfonic acid, water soluble (Acid layer); sodium salt	12	213.000
1,10-Phenanthroline	03	1281.950
Phendimetrazine tartrate	06	548.200
Phenethyl acetate	07	66.000
2-Phenethylamine	03	1282.000
Phenethyl benzoate	07	67.500
Phenethyl bromide	15	125.945
Phenethyl formate	07	68.000
Phenethyl isobutyrate	07	69.000
Phenethyl isovalerate	07	70.000
2-Phenethyl phenylacetate	07	71.000
1-Phenethyl-2-picolinium bromide	12	527.700
Phenethyl propionate	07	72.000
Phenethyl pyridinium bromide	12	527.750
Phenethyl salicylate	07	73.000
<i>p</i> -Phenetidine	03	1286.000
Phenindamine tartrate	06	102.000
Phenobarbital	06	458.000
Phenobarbital, sodium	06	459.000

Chemical name	Sect. Item	
	No.	No.
Phenol, alkylated	09	101.000
Phenol, benzylated	03	1298.103
Phenol, ethoxylated	12	754.000
Phenol, ethoxylated and phosphated	12	88.000
Phenolglycol ethers	15	125.970
Phenol, hindered	09	102.000
Phenolic and other tar acid resins	08	9.000
Phenol, natural, from petroleum, all other	03	1292.000
Phenol, natural, from petroleum, U.S.P.	03	1291.000
Phenol, propoxylated	12	754.020
Phenol salts, all other	14	231.000
Phenol, styrenated	03	1298.703
Phenol, styrenated, mixtures	09	103.000
Phenolsulfonaphthalein, sodium salt	03	1299.000
Phenolsulfonic acid	03	1299.200
1-Phenol-2-sulfonic acid, formaldehyde condensate (Phenol-formaldehyde, sulfonated)	14	467.000
Phenolsulfonic acid, sodium salt	03	1299.802
Phenolsulfonphthalein	06	580.000
Phenol, synthetic, from chlorobenzene by vapor-phase hydrolysis, U.S.P.	03	1296.000
Phenol, synthetic, from cumene by oxidation, U.S.P.	03	1297.000
Phenol, synthetic, from toluene by oxidation, U.S.P.	03	1298.050
Phenothiazine	06	122.000
Phenoxyacetic acid derivatives, all other	13	109.000
Phenoxyacetic acid, sodium salt	03	1299.600
3-Phenoxybenzaldehyde	03	1299.613
3-Phenoxybenzaldehyde acetal	03	1299.615
3-Phenoxybenzaldehyde cyanohydrin	03	1299.617
3-Phenoxybenzenemethanol	03	1299.618
2-Phenoxyethanol (Ethylene glycol monophenyl ether)	15	127.000
2-(2-Phenoxyethoxy)ethanol (Diethylene glycol phenyl ether)	15	128.000
2-Phenoxyethyl isobutyrate	07	74.000
2-(Phenoxyethyl)benzoic acid	03	1299.700
3-(Phenoxyphenyl) methyl-cis, trans-3-(2,2-dichloroethenyl)-2,2-dimethyl cyclopropanecarboxylate	13	166.025
Phenoxy (R) resin (other than for coating and adhesives)	08	25.000
<i>m</i> -Phenoxytoluene	03	1299.750
Phensuximide	06	423.000
Phentermine	06	549.000
Phentermine hydrochloride	06	549.500
Phenylacetaldehyde	07	75.000
Phenylacetaldehyde, dimethyl acetal	07	76.000
Phenylacetic acid	07	76.050
Phenylacetic acid isopentyl ester	07	76.055
Phenyl acid phosphate	14	168.000

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 4—Continued
Alphabetical chemical index

Chemical name	Sect. Item	
	No.	No.
Phenyl alanine	14	16.000
α -Phenylanisole	07	76.350
4-(Phenylazo) diphenylamine	03	1311.000
2-Phenylbenzimidazole	03	1312.600
Phenyldisodocyl phosphite	15	129.600
Phenyldimethyl urea	15	129.700
m-Phenylenebismaleimide	09	45.000
o-Phenylenediamine	03	1320.000
m-Phenylenediamine	03	1319.000
p-Phenylenediamine	03	1321.000
p-Phenylenediamines, substituted, other	09	65.000
Phenylephrine bitartrate	06	340.000
Phenylephrine hydrochloride	06	341.000
Phenyl ether (Diphenyl oxide)	03	1322.000
d(+) α -Phenylethylamine	03	1322.025
Phenylethyl 2-methyl butyrate	07	77.250
Phenyl glycidyl ether	15	131.500
N-Phenylglycine	03	1322.850
α -D-Phenylglycine methyl ester K	15	131.600
Phenylglycine, potassium salt	03	1322.702
Phenylglycine, sodium salt	03	1323.000
Phenylhydroquinone	03	1325.000
1-Phenyl-2-hydroxy-2-methyl-propanone-1	15	132.100
2,2'-[(Phenyl)imino]diethanol (N-Phenyldiethanolamine)	03	1327.000
Phenyl-5-mercaptotetrazole	14	375.000
Phenylmercuric acetate (PMA)	13	15.500
Phenylmercuric ammonium acetate	13	16.000
Phenylmercuric carboxylate	03	1329.050
Phenylmercuric oleate	13	20.000
Phenyl- α -naphthylamine	03	1329.403
o-Phenylphenol	03	1330.000
p-Phenylphenol	03	1331.000
p-Phenylphenol, alkoxyated	12	754.050
p-Phenylphenol, ethoxyated and propoxyated	12	754.070
o-Phenylphenol, sodium salt	03	1333.000
N-Phenyl-p-phenylenediamine	03	1334.000
Phenylphosphinic acid	03	1334.100
Phenylphosphonothioic dichloride	03	1334.300
Phenylphosphorus dichloride	03	1336.100
1-Phenyl-1,2-propanedione, 2-oxime	03	1338.000
Phenylpropanolamine bitartrate	06	343.500
Phenylpropanolamine hydrochloride	06	343.000
3-Phenylpropyl acetate	07	79.000
3-Phenylpropyl cinnamate	07	79.200
Phenyl propyl formate	07	79.300
4-Phenylpropylpyridine	03	1339.853
1-Phenyl-3-pyrazolidone	14	377.000

Chemical name	Sect. Item	
	No.	No.
4-Phenylpyridine-N-oxide	03	1340.800
Phenylstyrene, ethoxyated	12	754.080
di-Phenylsuccinic acid	03	1341.009
5-Phenyltetrazole	09	109.200
4-Phenylthiomorpholine-1,1-dioxide	03	1342.202
Phenyltoloxamine citrate	06	104.000
Phenyltriethoxysilane	03	1342.250
Phenyl xylyl ethane	15	134.800
1-Phenylsal-1,2-propanidione	07	115.150
Phenytoln	06	423.300
Phenytoln, sodium	06	423.600
Phosgene (Carbonyl chloride)	15	1411.000
Phosphated and polyphosphated alcohols, all other	12	111.000
2-Phosphonobutane-1,2,4-tricarboxylic acid, sodium salt	14	86.000
N-(Phosphonomethyl)glycine, isopropylamine salt	13	205.950
N-(Phosphonomethyl)glycine, sodium sesqui salt	13	231.592
Phosphoric acid esters, all other	11	16.000
Phosphoric acid esters, all other	11	105.000
Phosphoric and polyphosphoric acid esters, all other	12	113.000
Phosphorodithioates used as flotation reagents, all other	14	133.000
Phosphorodithioates used as lubricating oil and grease additives, all other	14	244.000
Phosphorodithioic acid salts (Dithiophosphates), all other	15	736.000
Phosphorus acid esters, all other	15	1049.000
Photographic chemicals, all other	14	383.000
Phthalic acid	03	1346.000
Phthalic acid, diallyl ester	11	23.400
Phthalic acid, lead salt, (Dibasic)	15	135.000
Phthalic anhydride	03	1348.000
Phthalic anhydride esters, all other	11	51.000
Phthalic anhydride type alkyd resins	08	2.000
Phthalimide	03	1351.000
Phthalimidoacetic acid	03	1351.402
[Phthalocyaninato(2-)]copper	03	1352.000
Phthalocyaninetetra-sulfonyl chloride, copper derivative	03	1353.800
Phthaloyl chloride (Phthalyl chloride)	03	1355.000
Picoline (3,4-mixture)	03	1359.000
2-Picoline (α -Picoline)	03	1356.000
3-Picoline (β -Picoline)	03	1357.000
4-Picoline (γ -Picoline)	03	1358.000
2-Picoline-N-oxide	03	1359.002
3-Picoline-N-oxide	03	1359.003
Picolinic acid	03	1360.000
Picolonitrile (2-Cyanopyridine)	03	1359.100
3-Picolylamine	03	1361.000

Table 4—Continued
Alphabetical chemical index

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Chemical name	Sect. No.	Item No.
Picramic acid, sodium salt	15	136.000
Picric acid (Trinitrophenol)	03	1362.000
Pigment Black 7	05	143.007
Pigment black toners, all other	05	144.000
Pigment Blue 1, (PMA)	05	99.000
Pigment Blue 1, (PTA)	05	100.000
Pigment Blue 2, (PMA)	05	102.000
Pigment Blue 14, (PMA)	05	111.000
Pigment Blue 15, (α form)	05	113.010
Pigment Blue 15:1, (α form)	05	113.020
Pigment Blue 15:2, (α form)	05	113.030
Pigment Blue 15:3, (β form)	05	114.010
Pigment Blue 15:4, (β form)	05	114.020
Pigment Blue 19	05	116.000
Pigment Blue 25	05	119.000
Pigment Blue 27	05	119.027
Pigment Blue 61	05	120.061
Pigment blue toners, all other	05	124.000
Pigment Brown 5	05	140.000
Pigment brown toners, all other	05	142.000
Pigment Green 1, (PMA)	05	125.000
Pigment Green 2, (PMA)	05	127.000
Pigment Green 2, (PTA)	05	128.000
Pigment Green 4, (fugitive)	05	129.000
Pigment Green 4, (PMA)	05	130.000
Pigment Green 7	05	132.000
Pigment Green 8	05	133.000
Pigment Green 10	05	134.000
Pigment Green 36	05	134.260
Pigment green toners, all other	05	135.000
Pigment Orange 1	05	19.000
Pigment Orange 2	05	20.000
Pigment Orange 5	05	21.000
Pigment Orange 13	05	23.000
Pigment Orange 15	05	24.000
Pigment Orange 16	05	25.000
Pigment Orange 17	05	206.000
Pigment Orange 34	05	25.180
Pigment Orange 36	05	25.190
Pigment Orange 43	05	25.270
Pigment Orange 46	05	26.046
Pigment Orange 48	05	26.048
Pigment Orange 49	05	26.049
Pigment orange toners, all other	05	29.000
Pigment Red 1, (light)	05	48.000
Pigment Red 2	05	30.000
Pigment Red 3	05	49.000

Chemical name	Sect. No.	Item No.
Pigment Red 4	05	50.000
Pigment Red 5	05	31.000
Pigment Red 7	05	32.000
Pigment Red 9	05	33.000
Pigment Red 13	05	36.000
Pigment Red 14	05	37.000
Pigment Red 17	05	39.000
Pigment Red 21	05	40.021
Pigment Red 22	05	43.000
Pigment Red 23	05	44.000
Pigment Red 31	05	45.000
Pigment Red 38	05	52.000
Pigment Red 41	05	54.000
Pigment Red 48	05	55.000
Pigment Red 48:1, (barium)	05	55.100
Pigment Red 48:2, (calcium)	05	55.200
Pigment Red 48:3, (strontium)	05	55.300
Pigment Red 48:4, (manganese)	05	55.400
Pigment Red 49:1, (barium)	05	57.000
Pigment Red 49:2, (calcium)	05	58.000
Pigment Red 52:1, (calcium)	05	61.000
Pigment Red 52:2, (manganese)	05	62.000
Pigment Red 53, (sodium)	05	63.000
Pigment Red 53:1, (barium)	05	64.000
Pigment Red 57	05	67.057
Pigment Red 57:1, (calcium)	05	68.000
Pigment Red 60:1	05	209.000
Pigment Red 63	05	70.000
Pigment Red 70	05	71.070
Pigment Red 81, (PMA)	05	74.000
Pigment Red 81, (PTA)	05	75.000
Pigment Red 83	05	211.000
Pigment Red 88	05	78.000
Pigment Red 101	05	79.101
Pigment Red 112	05	45.810
Pigment Red 122	05	79.320
Pigment Red 123	05	80.000
Pigment Red 147	05	45.847
Pigment Red 168	05	80.550
Pigment Red 170	05	45.870
Pigment Red 179	05	80.660
Pigment Red 181	05	80.680
Pigment Red 188	05	80.688
Pigment Red 190	05	80.770
Pigment Red 200	05	84.200
Pigment Red 202	05	84.202
Pigment Red 206	0	84.206

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 4—Continued
Alphabetical chemical index

Chemical name	Sect. Item	
	No.	No.
Pigment Red 207	05	84.207
Pigment Red 209	05	84.209
Pigment Red 224	05	84.224
Pigment Red 245	05	84.245
Pigment Red 63:1, calcium	05	70.001
Pigment Violet 1, (fugitive)	05	87.000
Pigment Violet 1, (PMA)	05	88.000
Pigment Violet 1, (PTA)	05	89.000
Pigment Violet 3, (fugitive)	05	90.000
Pigment Violet 3, (PMA)	05	91.000
Pigment Violet 3, (PTA)	05	92.000
Pigment Violet 4, (fugitive)	05	92.004
Pigment Violet 5:1	05	92.005
Pigment Violet 19	05	93.160
Pigment Violet 23	05	93.200
Pigment Violet 29	05	93.229
Pigment Violet 31	05	93.280
Pigment Violet 39, (PMA)	05	93.439
Pigment Violet 42	05	94.042
Pigment violet toners, all other	05	98.000
Pigment Yellow 1	05	1.000
Pigment Yellow 2	05	1.500
Pigment Yellow 3	05	2.000
Pigment Yellow 12	05	8.000
Pigment Yellow 13	05	9.000
Pigment Yellow 14	05	10.000
Pigment Yellow 17	05	11.000
Pigment Yellow 42	05	6.372
Pigment Yellow 49	05	6.380
Pigment Yellow 55	05	11.380
Pigment Yellow 60	05	6.460
Pigment Yellow 65	05	6.465
Pigment Yellow 73	05	6.620
Pigment Yellow 74	05	6.630
Pigment Yellow 75	05	6.640
Pigment Yellow 83	05	11.660
Pigment Yellow 97	05	6.697
Pigment Yellow 98	05	6.698
Pigment Yellow 116	05	6.714
Pigment Yellow 124	05	11.724
Pigment Yellow 126	05	11.726
Pigment Yellow 127	05	11.727
Pigment Yellow 139	05	14.839
Pigment Yellow 150	05	14.850
Pigment Yellow 152	05	11.752
Pigment yellow toners, all other	05	18.000
Pinane	15	136.200

Chemical name	Sect. Item	
	No.	No.
Pinane hydroperoxide	15	136.500
2-Pinanol (cis and trans)	15	136.800
α -Pinene	15	137.000
β -Pinene	15	138.000
α -Pinene epoxide	15	139.000
Pinene, sulfate	15	140.000
Pinene, wood	15	141.000
Pine oil, natural sulfate	15	141.195
Pine oil, sulfated	12	294.500
Pine oil, synthetic	15	141.200
Pine oil, synthetic	15	1412.000
Pipecolic acid	03	1362.953
Piperacillin	06	19.200
Piperazine	06	123.000
Piperazine dihydrochloride	06	125.000
Piperazine hydrochloride	06	127.000
Piperazine sulfate	06	129.000
Piperidine	03	1365.000
Piperonal (Hellotropin)	07	80.000
Piperylene (1,3-Pentadiene)	02	58.600
Piroxicam	06	412.500
Pitch of tar, all other	01	30.000
Pitch of tar: hard (M.P. 161° F and Over)	01	28.000
Pitch of tar: medium (M.P. 110° To 160° F)	01	27.000
Pitch of tar: soft (M.P. 80° To 109° F.)	01	26.000
Pivaloyl chloride	15	569.000
2-Pivaloyl-1,3-indandione (Pindone)	13	170.000
Plant growth regulators, acyclic, all other	13	231.590
Pinol	07	115.300
Pinyl acetate	07	115.290
Polyacrylamide	14	403.000
Polyacrylamide copolymers, all other	14	405.500
Polyacrylamide dimethylammonium ethyl methacrylate	14	404.000
Polyacrylate methacrylate copolymers	14	427.000
Polyacrylate poly(hydroxypropylacrylate) copolymer	14	428.000
Polyacrylic acid	15	570.000
Polyacrylic acid	14	430.000
Poly(acrylic acid, ethyl ester)	14	423.000
Poly(acrylic acid, methyl ester/ethylene/1,1-dichlorosuccinic acid, methylene-) with ethyl acrylate	14	425.000
Polyacrylic acid salts, all other	14	434.000
Polyacrylic (ACM) type elastomers	10	13.000
Polyacrylonitrile and acrylonitrile copolymers	14	391.000
Polyacrylonitrile, hydrolyzed	14	435.000
Polyacrylonitrile, hydrolyzed, sodium salt	13	234.000
Polyacrylonitrile, starch hydrolyzed polymer	14	436.000
Polyallycylene polyamines and salts and quats	12	417.500

Table 4—Continued
Alphabetical chemical index

<i>Chemical name</i>	<i>Sect. No.</i>	<i>Item No.</i>
Polyalkalene oxide	10	13.200
Polyalkylene glycol oleate	12	719.050
Polyalkylene polyamine, ethoxylated	12	333.700
Polyamine polymethane phosphonic acid	14	87.000
Polyamine polymethane phosphonic acid, magnesium salt	14	88.000
Polyamines	14	437.000
Polyamine/tall oil imidazoline	12	413.400
Polybasic acid type alkyd resins	08	3.000
Polybutadiene acrylic acid acrylonitrile terpolymer (PBAN)	10	13.300
Polybutadiene, emulsion-polymerized	10	14.000
Polybutadiene resins	08	10.000
Polybutadiene, solution-polymerized	10	15.000
Polybutene	02	86.000
Polybutylene terephthalate (PBT)	08	30.020
Polybutylene type resins	08	28.000
Polybutylether carbamate	14	169.000
Polycarbonate resins	08	29.000
Polycarboxylic acid, alkylate	12	719.200
Polycarboxylic acid, alkylphenoxyalkoxylate	12	719.210
Polychloroprene (Neoprene) (CR) type	10	17.000
Polydextrose	14	438.000
Poly(diallyldimethylammonium chloride)	14	439.000
Poly(dimethylimino(2-hydroxytrimethylene)chloride)	14	170.000
Polyester resins, saturated, all other	08	30.050
Polyester resins, unsaturated	08	12.000
Polyether amine, ethoxylated	12	334.400
Polyether diols	12	762.730
Polyether glycol	15	1092.200
Polyether and polyester polyols for urethanes	08	12.050
Polyether triols	12	762.750
Polyethoxy methylstearyl ammonium chloride	12	465.600
Polyethoxy propoxy diethylene glycol ether	15	1180.500
Polyethylbenzene (80% diethylbenzene)	03	1369.000
Polyethylene glycol	15	1181.000
Polyethylene glycol dibenzoate	11	52.000
Polyethylene glycol diester of coconut oil acids	12	684.290
Polyethylene glycol diester of coconut oil and oleic acids	12	684.300
Polyethylene glycol diester of mixed liner acid/oleic acid	12	684.400
Polyethylene glycol diester of tall oil acids	12	684.500
Polyethylene glycol dilaurate	12	674.000
Polyethylene glycol dimethyl ether	15	1181.200
Polyethylene glycol dioleate	12	675.000
Polyethylene glycol distearate	12	676.000
Polyethylene glycol ester of mixed fatty acids	12	684.700
Polyethylene glycol esters of chemically defined acids, all other	12	684.000

<i>Chemical name</i>	<i>Sect. No.</i>	<i>Item No.</i>
Polyethylene glycol hydroxyacetate	12	676.500
Polyethylene glycol monocaprylate	12	677.500
Polyethylene glycol monoester of coconut oil acids	12	685.510
Polyethylene glycol monoester of mixed oleic/pelargonol acids	12	685.600
Polyethylene glycol monoester of soybean oil acids	12	685.000
Polyethylene glycol monoester of tall oil acids	12	685.700
Polyethylene glycol monolaurate	12	678.000
Polyethylene glycol mono-monomerate	12	678.500
Polyethylene glycol mono-oleate	12	679.000
Polyethylene glycol mono-oleate, ethoxylated	12	679.100
Polyethylene glycol monopalmitate	12	680.000
Polyethylene glycol monopelargonate, methoxylated	12	680.250
Polyethylene glycol monopelargonate	12	680.200
Polyethylene glycol monoricinoleate	12	681.000
Polyethylene glycol monostearate	12	682.000
Polyethylene glycol monotallate	12	682.250
Polyethylene glycol (mixed ester) of tall oil acids	12	685.900
Polyethylene glycol sesquiester of castor oil acids	12	686.000
Polyethylene glycol sesquiester of coconut oil acids	12	687.000
Polyethylene glycol sesquiester of tall oil acids	12	689.000
Polyethylene glycol sesquiester of tallow acids	12	690.000
Polyethylene glycol sesquioleate	12	683.000
Polyethylene glycol terephthalate	12	683.200
Polyethylene resins, specific gravity 0.940 and below	08	31.100
Polyethylene resins, specific gravity 0.940 and below	08	31.400
Polyethylene resins, specific gravity over 0.940	08	32.000
Polyethylenimine	14	442.000
Polyethylenimine methyl ammonium sulfate	12	477.250
Polyethylenepolyamine, alkoxyated	12	334.000
Polyethylenepolyamine polymer with 1,4-dihydroxy-2-butyne	14	171.000
Polyethylene terephthalate	14	390.000
Polyethylene terephthalate (PET)	08	30.040
Polyethyl methacrylate	08	20.035
Polyglycerol decaoleate	12	692.200
Polyglycerol decaoleate	12	697.400
Polyglycerol distearate	12	692.500
Polyglycerol mono-oleate	12	696.000
Polyglycerol monostearate	12	697.000
Polyglycols, ethylene glycol and glycol ether, mixed	15	1184.000
Polyhexafluoropropylene oxide	15	1268.900
Polyhydric alcohol esters, all other	15	1141.000
Polyhydric alcohol ethers, all other	15	1196.000
Polyhydric alcohol, ethoxylated and phosphated	12	88.800
Polyhydric alcohols, all other	15	1096.000
Polyimides and amide-imide polymers	08	34.000
Polyimine, propoxyated	12	334.500
Polyisobutylene, type elastomers	10	18.000

Table 4—Continued
Alphabetical chemical index

Chemical name	Sect. Item	
	No.	No.
Polyisoprene (IR) type	10	19.000
Polymeric phosphites	09	85.500
Polymerization regulators, acyclic, other	09	173.000
Polymers for fibers, all other	14	394.000
Polymers, water soluble, all other	14	452.000
Polymethacrylic acid esters	15	1499.000
Polymethacrylic acid, sodium salt	14	445.000
Polymethylene polyphenylisocyanate	03	1023.000
Poly(1,1'-(methylimino)bis(3-chloro-2-propanol)tetramethylethylenediamine	14	446.000
Polymethyl methacrylate (PMMA)	08	20.040
Polymethylvinyl ether monoethylmaleate	15	1181.600
Poly(mixed ethylene, propylene) glycol	12	763.000
Poly(mixed ethylene/propylene glycol) capped with alkyl oxirane	12	763.050
Polymyxin B	06	56.000
Polyol aluminum chelate	15	1132.190
Poly- α -olefins	14	453.000
Poly- α -olefins, sulfurized	14	454.000
Polyol glycidyl ether	15	1317.700
Polyoxyalkene silicones	15	1391.000
Polyoxyalkylated cyclic amines	14	468.000
Polyoxyalkylate (fatty alcohol), phosphate ester	12	112.650
Poly(oxy-1,2-ethanedyl), w-(2-carboxyethoxy)-w'-hydroxy-, α' -(iminodi-2, 1-ethanedyl) bis-, N-tallow alkyl derivs., potassium salt	12	47.490
Poly(oxy-1,2-ethanedyl) carboxy-methyl,	12	47.500
Poly(oxy-1,2-ethanedyl)- α -carboxymethyl, omega-(tridecyloxy), potassium salt	06	457.000
OPoly(oxy-1,2-ethanedyl), α -phenylmethyl- ω -hydroxy, C ₁₂ -C ₁₅ alkyl ethers	12	763.450
Poly(oxy-1,2-ethanedyl), α -phenylmethyl- ω -hydroxy, ethoxylated nonylphenol alkyl ether	12	763.500
Poly[oxyethylene (dimethylimino)ethylene (dimethylimino)ethylene dichloride]	13	195.013
Poly(oxypropylene) diamine	15	297.720
Polyoxypropylene polyoxyethylene glycol, mixed	15	1185.000
Polyphenolic phosphites, polyalkylated	09	86.000
Polyphenyl aromatic ester resins	08	34.500
Poly-m-phenylene isophthalamide	14	392.000
Polyphenylene oxide type resins	08	35.000
Polyphenylene sulfide resins	08	35.500
Poly-p-phenylene terephthalamide	14	393.000
Poly(propoxy)butyl ether, ethoxylated	15	1182.005
Polypropoxy diethylmethyl ammonium chloride	12	465.650
Polypropoxy ethers, all other	15	1183.000
Polypropylene glycol	15	1186.000

Chemical name	Sect. Item	
	No.	No.
Polypropylene glycol butyl ether	12	763.950
Polypropylene glycol dioleate	12	719.400
Polypropylene glycol, ethoxylated	12	764.000
Polypropylene glycol glycerol tri-ether	15	1186.500
Polypropylene glycol monooleate	12	719.410
Polypropylene polymer and copolymer resins	08	36.000
Polysulfide (T) type elastomers	10	19.500
Polysulfone monomer	03	1023.500
Polysulfone resins	08	37.000
Polyterpene resins	08	38.000
Polytetrafluoroethylene (PTFE)	08	38.100
Polytetrafluoroethylene ethyl iodide	15	1269.000
Polytetramethylene glycol ether	15	1187.000
Poly(1,1,1-trichlorobutane-2-ol)ethylene glycol dextrose ether	15	1187.200
Polyurethane elastomers	08	13.040
Polyurethane resins	08	13.080
Polyvinyl acetate resins	08	47.000
Polyvinyl alcohol resins	08	48.000
Polyvinyl butyral resins	08	49.000
Polyvinyl chloride copolymer resins, all other	08	49.020
Polyvinyl chloride homopolymer resins	08	49.010
Polyvinyl formal resin	08	49.050
Polyvinylidene fluoride resin	08	38.150
Polyvinyl octadecyl carbamate	15	468.300
Poly(vinyl-O-sulfobenzal)	14	379.000
Potassium acetate	15	602.000
Potassium aminobenzoate	06	395.000
Potassium benzoate	15	10.800
Potassium citrate	15	625.000
Potassium dihexyl phosphorodithioate	15	730.500
Potassium 2-ethylhexanoate	15	641.000
Potassium formate	15	653.000
Potassium gluconate	06	766.000
Potassium glutamate	14	9.000
Potassium glycolate	15	663.750
Potassium 2-methyl-2-butanol	15	1411.400
Potassium 2-methyl-2-propanol	15	1411.600
Potassium oxalate	15	725.000
Potassium salicylate	06	387.000
Potassium and sodium salts of fatty, rosin, and tall oil acids, all other	12	74.000
Potassium sodium tartrate	15	768.000
Potassium stearate	15	761.500
Potassium thioacetate	15	781.000
Potassium warfarin	06	629.000
Povidone-iodine	06	271.000

Table 4—Continued
Alphabetical chemical index

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Chemical name	Sect. Item	
	No.	No.
Pramoxine hydrochloride	06	710.000
Prazepam	06	508.000
Prazosin hydrochloride	06	359.700
Prednisolone	06	664.000
Prednisolone acetate	06	665.000
Prednisone	06	666.000
Prilocaine hydrochloride	06	716.001
Primary monoamines, all other	12	430.000
Priming and refractory oil	01	21.040
Probenecid	06	740.000
Probutol	06	616.000
Procainamide hydrochloride	06	380.000
Procarbazine hydrochloride	06	279.400
Progesterone	06	683.000
1-Propanamine, 3-(C ₁₂ -C ₁₈ alkoxy derivatives)	12	413.500
1-Propanaminium, N-ethyl-N,N-dimethyl-3-[(1-oxooctadecyl)amino]-, ethyl sulfate	12	477.280
Propane (Commercial and hd-5)	02	41.000
1,2-Propanediamine (Propylenediamine)	15	298.000
1,3-Propanediamine, alkoxylated	12	334.620
1,2-Propanediol dioctanoate/decanoate	12	699.080
1,2-Propanediol dipelargonate	12	699.140
Propanediol esters, all other	12	704.000
1,2-Propanediol d1-2-ethyl mexanoate	12	698.900
Propanediol hydrochloride	15	316.050
1,2-Propanediol monoester of coconut oil acids	12	700.001
1,2-Propanediol monoaurate	12	701.000
1,2-Propanediol mono-oleate	12	702.000
1,2-Propanediol monostearate	12	703.000
3 Propanoic acid, cocoamino, sodium salt	12	31.500
3 Propanonitrate methylphenyl ether	12	764.200
Propantheline bromide	06	293.000
p-Propenylanisole (Anethole)	07	81.000
Propionaldehyde	15	802.000
Propionic acid	15	572.000
Propionic anhydride	15	573.000
Propionitrile	15	450.500
Propionyl chloride	15	573.050
Propiophenone	03	1374.000
Propoxyethanol (Ethylene glycol monopropyl ether)	15	1187.750
Propoxylated starches	14	496.000
Propoxyphene hydrochloride	06	413.000
Propoxyphene napsylate	06	414.000
Propyl acetate	15	1050.000
Propyl alcohol (Propanol)	15	868.000
Propylamine, mono-	15	301.000
n-Propylaminoethanol	15	468.500

Chemical name	Sect. Item	
	No.	No.
p-Propylanisol (Dihydroanethole)	07	81.200
S-Propyl butylethylthiocarbamate (Pebulate)	13	206.000
n-Propyl chloroformate	15	1050.300
S-Propyl dipropylthiocarbamate (Vernolate)	13	207.000
Propylene	02	42.000
Propylene carbonate	15	1051.000
Propylene glycol (1,2-Propanediol)	15	1093.000
Propylene glycol adipate	11	65.500
Propylene glycol dibenzoate	15	147.800
Propylene glycol esters of hydrogenated palm oil	12	719.500
Propylene glycol, mixed ethers	15	1188.000
Propylene glycol monoricinoleate	11	110.500
Propylene glycol sebacate	11	115.500
Propylene oxide	15	1323.000
Propyl gallate	15	148.000
Propylhexedrine	06	344.000
n-Propylidene phthalide	07	81.300
n-Propyl mercaptan (1-Propanethiol)	02	96.000
n-Propyl oleate	11	95.000
Propyl oleate, sulfated, sodium salt	12	262.000
2-Propyn-1-ol (Propargyl alcohol)	15	869.000
Protease (bacterial)	14	104.000
Proteases, all other	14	108.000
Protein hydrolysates	14	17.000
Pseudoephedrine hydrochloride	06	346.000
Pseudoephedrine sulfate	06	347.000
Pseudoionone	15	836.000
Pseudo linanyl acetate (Neobergamate)	07	166.700
Pyrantel pamoate	06	129.300
Pyrantel tartrate	06	129.600
8,16-Pyranthrene-dione	03	1376.000
1,3,6,8-Pyrenetetrasulfonic acid	03	1377.200
3-Pyridinemethanol	03	1383.000
2° Pyridine, refined	03	1378.000
Pyridine, refined all other grades	03	1379.000
2 Pyridinethiol-1-oxide, sodium salt	03	1380.003
2 Pyridinethiol-1-oxide, zinc salt	03	1380.053
Pyridostigmine bromide	06	319.000
Pyrimidine maleate	06	105.000
Pyrimidine tannate	06	107.000
2-Pyrimidinol	03	1387.000
2-Pyrrolidinone (2-Pyrrolidone)	03	1391.000
4-N-(1-Pyrrolidyl)-m-toluenediazonium chloride	14	380.000
Pyrvinium pamoate	03	797.200
Quaternary ammonium salts having amide linkages, all other	12	479.000

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 4--Continued
Alphabetical chemical index

Chemical name	Sect. Item	
	No.	No.
Quaternary ammonium salts, not containing oxygen, acyclic, all other	12	507.000
Quaternary ammonium salts not containing oxygen, cyclic, all other	12	528.000
Quinoline-2,3-dicarboxylic acid	03	1395.500
Quinoline, other grades	03	1395.000
Quinolinium-1-phenylmethyl chloride	03	1395.700
8-Quinolol, copper salt	13	30.000
8-Quinolol, magnesium salt	13	30.200
p-Quinone	15	14.000
Quinone dioxime	03	1397.500
Rare earths 2-ethylhexanoate	15	642.000
Rare earths naphthenate	14	312.000
Rare earths neodecanoate	15	709.750
Reactive Black 5	04	952.000
Reactive Black 9	04	953.000
Reactive Blue 3	04	939.000
Reactive Blue 4	04	940.000
Reactive Blue 5	04	941.000
Reactive Blue 7	04	942.000
Reactive Blue 13	04	942.013
Reactive Blue 19	04	943.000
Reactive Blue 21	04	944.000
Reactive Blue 38	04	946.000
Reactive Blue 71	04	946.071
Reactive Blue 89	04	946.089
Reactive Blue 173	04	946.173
Reactive Blue 174	04	946.174
Reactive Blue 199	04	946.199
Reactive Blue 203	04	946.203
Reactive blue dyes, all other	04	947.000
Reactive Brown 1	04	949.000
Reactive Brown 17	04	949.017
Reactive Brown 18	04	949.018
Reactive Green 12	04	948.012
Reactive Green 19	04	948.019
Reactive green dyes, all other	04	948.999
Reactive Orange 1	04	912.000
Reactive Orange 4	04	913.000
Reactive Orange 12	04	914.000
Reactive Orange 13	04	915.000
Reactive Orange 14	04	916.000
Reactive Orange 16	04	917.000
Reactive Orange 20	04	917.020
Reactive Orange 78	04	917.078
Reactive Orange 84	04	917.084
Reactive Orange 86	04	917.086

Chemical name	Sect. Item	
	No.	No.
Reactive orange dyes, all other	04	918.000
Reactive Red 2	04	920.000
Reactive Red 11	04	924.000
Reactive Red 21	04	925.000
Reactive Red 29	04	926.000
Reactive Red 31	04	927.000
Reactive Red 33	04	928.000
Reactive Red 43	04	930.043
Reactive Red 49	04	930.049
Reactive Red 94	04	931.094
Reactive Red 120	04	931.120
Reactive Red 123	04	931.123
Reactive Red 141	04	931.141
Reactive Red 160	04	931.160
Reactive Red 180	04	931.180
Reactive red dyes, all other	04	932.000
Reactive Violet 5	04	936.000
Reactive violet dyes, all other	04	937.000
Reactive Yellow 6	04	903.000
Reactive Yellow 7	04	904.000
Reactive Yellow 15	04	905.000
Reactive Yellow 17	04	906.000
Reactive Yellow 18	04	907.000
Reactive Yellow 22	04	907.022
Reactive Yellow 37	04	910.000
Reactive Yellow 42	04	910.042
Reactive Yellow 57	04	910.057
Reactive Yellow 86	04	910.086
Reactive Yellow 133	04	910.133
Reactive Yellow 135	04	910.135
Reactive Yellow 160	04	910.160
Reactive yellow dyes, all other	04	911.000
Reactive Red 35	04	928.035
Rennin	14	106.000
Resorcinol	06	272.000
Resorcinol monobenzoate	15	151.000
Resorcinol, tech.	03	1399.000
β -Resorcylic acid, lead salt	03	1403.000
Rhodinol	07	167.000
Rhodinyl acetate	07	168.000
Riboflavin (animal feed grade)	06	801.000
Riboflavin (medicinal grade)	06	802.000
Ricebean oil, sulfated, sodium salt	12	311.000
Ricinoleic acid salts, all other	15	742.000
Rodenticides, acyclic, all other	13	233.000
Rodenticides, cyclic, all other	13	171.000
Rose oxide	07	115.500

Table 4—Continued
Alphabetical chemical index

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<i>Chemical name</i>	<i>Sect. Item</i>	
	<i>No.</i>	<i>No.</i>
Rosin acids, potassium salt	12	65.000
Rosin acids, sodium salt	12	66.000
Rosin acids, triethanolamine salt	12	32.000
Rosin alcohol, ethoxylated	12	765.000
Rosin amine, ethoxylated	12	355.000
Rosin amines	14	136.000
Rosin esters, unmodified (Ester gums)	08	39.000
Roxarsone	06	159.000
Roxarsone, sodium	06	160.000
Rubber modified polystyrene	08	44.020
Rubber-processing chemicals, cyclic, all other	09	127.000
Rust preventing additives	14	172.000
Saccharin (1,2-Benzisothiazolin-3-one,-1,1-dioxide)	07	85.000
Saccharin, sodium salt	07	87.000
Salicylaldehyde	03	1404.000
Salicylaldehyde oxime	03	1404.502
Salicylanilide	03	1405.000
Salicylic acid	06	557.000
Salicylic acid	15	161.500
Salicylic acid magnesium salt	15	162.200
Salicylic acid, tech.	03	1406.000
Salsalate	06	389.000
α -Santalol	07	116.000
α -Santalyl acetate	07	116.100
Sarcosine	14	18.000
Sassafrass oil, hydrogenated	07	116.200
Sebacic acid	15	574.000
Sebacoyl chloride	15	575.000
Secobarbital	06	460.000
Secobarbital, sodium	06	461.000
Secondary and tertiary monoamines, all other	12	447.000
Semicarbazide hydrochloride	15	473.000
Silicone fluids	15	1392.000
Silicone greases	14	462.000
Silicone resins	08	14.000
Silicone resins for mold release agents	15	1480.000
Silicone (Q) type elastomers	10	20.000
Silver trifluoroacetate	15	742.700
Sisomycin	06	56.700
Sitosterols	06	618.000
Sodium acetate	15	603.000
Sodium aminobenzoate	06	396.000
Sodium ammonium polyacrylate and copolymers	14	431.000
Sodium ascorbate	06	809.000
Sodium benzene phosphinate	15	162.250
Sodium benzoate, U.S.P.	15	12.000
Sodium benzoate, tech.	15	11.000

<i>Chemical name</i>	<i>Sect. Item</i>	
	<i>No.</i>	<i>No.</i>
Sodium n-butylxanthate	14	142.000
Sodium caprylate	06	137.000
1-(Sodium carboxyethylene)-1-(sodium carboxymethyleneoxyethylene)-2-nor-(tall oil fatty acids)-2-Imidazolium hydroxide	12	27.100
Sodium carboxymethyl amylose	14	432.000
Sodium carboxymethylcellulose (100%)	14	412.000
1-(Sodium carboxymethyl)-1-(sodium carboxymethyleneoxyethylene)-2-nor-(coconut oil fatty acids)-2-Imidazolium lauryl sulfate	12	27.200
Sodium carboxymethyl starch	14	432.000
Sodium 5-[2-chloro-4-(trifluoromethyl)-phenoxy]-2-nitrobenzoate	13	118.042
Sodium citrate	15	626.000
Sodium cresylate	01	18.050
Sodium diacetate	15	604.000
Sodium di-sec-butyl/diethyl phosphorodithioate	15	731.000
Sodium di-sec-butyl phosphorodithioate	15	732.000
Sodium di-2-ethylhexyl sulfosuccinate	15	742.900
Sodium diethyl phosphorodithioate	15	733.000
Sodium dihexyl phosphorodithioate	15	734.000
Sodium dihydrobis(2-methoxyethoxy)aluminum hydride	15	1363.900
Sodium diisopropyl phosphorodithioate	15	735.000
Sodium ethoxide	15	1415.000
Sodium fluoroacetate	13	232.000
Sodium formaldehyde bisulfite	15	743.250
Sodium formate	15	653.995
Sodium formate, refined	15	654.000
Sodium formate, technical	15	655.000
Sodium gluconate	15	662.000
Sodium heparin	06	630.000
Sodium lactate (Nalac)	15	674.000
Sodium mercaptoacetate	15	697.000
Sodium methoxide (Sodium methylate)	15	1418.000
Sodium-N-methyl-N-oleyl taurate	15	743.550
Sodium nitroprusside	06	359.800
Sodium oleate	15	719.500
Sodium oxalate	15	726.000
Sodium phenate or carbolate	01	22.050
Sodium polyacrylate	14	433.000
Sodium propionate	15	738.000
Sodium salicylate	06	390.000
Sodium stearate	15	762.100
Sodium p-sulfophenylmethyl ether	03	1410.100
Sodium trichlorobenzenesulfate	03	1410.500
Solid type polyvinylidene chloride resins	08	50.020
Solubilized Sulfur Black 2	04	1111.000

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 4—Continued
Alphabetical chemical index

Chemical name	Sect. No.	Item No.
Solvent Black 7	04	1053.000
Solvent Black 13	04	1055.000
Solvent Black 26	04	1057.000
Solvent Black 46	04	1057.046
Solvent Black 48	04	1057.048
Solvent Black 49	04	1057.049
Solvent Blue 3	04	1020.000
Solvent Blue 4	04	1021.000
Solvent Blue 5	04	1022.000
Solvent Blue 23	04	1028.023
Solvent Blue 35	04	1028.035
Solvent Blue 36	04	1029.000
Solvent Blue 38	04	1031.000
Solvent Blue 58	04	1033.000
Solvent Blue 59	04	1034.000
Solvent Blue 60	04	1035.000
Solvent Blue 98	04	1037.000
Solvent Blue 99	04	1037.099
Solvent Blue 100	04	1038.000
Solvent Blue 102	04	1038.102
Solvent Blue 128	04	1038.128
Solvent Blue 129	04	1038.129
Solvent blue dyes, all other	04	1039.000
Solvent Brown 12	04	1045.000
Solvent Brown 20	04	1047.000
Solvent Brown 22	04	1048.000
Solvent Brown 38	04	1049.000
Solvent Brown 52	04	1049.052
Solvent Green 1	04	1040.000
Solvent Orange 2	04	977.000
Solvent Orange 3	04	978.000
Solvent Orange 7	04	980.000
Solvent Orange 20	04	981.000
Solvent Orange 23	04	982.000
Solvent Orange 25	04	984.000
Solvent Orange 31	04	985.000
Solvent Orange 60	04	987.060
Solvent Orange 74	04	987.074
Solvent Orange 76	04	987.076
Solvent Orange 77	04	987.077
Solvent Orange 97	04	987.097
Solvent orange dyes, all other	04	988.000
Solvent Red 1	04	989.000
Solvent Red 22	04	991.000
Solvent Red 23	04	991.023
Solvent Red 24	04	992.000
Solvent Red 26	04	993.000

Chemical name	Sect. No.	Item No.
Solvent Red 27	04	994.000
Solvent Red 49	04	999.000
Solvent Red 68	04	1001.000
Solvent Red 74	04	1003.000
Solvent Red 111	04	1008.000
Solvent Red 125	04	1008.125
Solvent Red 164	04	1011.000
Solvent Red 165	04	1011.165
Solvent Red 166	04	1012.000
Solvent Red 168	04	1012.168
Solvent Red 169	04	1012.169
Solvent Red 172	04	1012.172
Solvent Red 175	04	1012.175
Solvent Red 207	04	1012.207
Solvent Red 208	04	1012.208
Solvent Red 209	04	1012.209
Solvent Red 210	04	1012.210
Solvent Red 222	04	1012.222
Solvent red dyes, all other	04	1013.000
Solvent Violet 8	04	1014.000
Solvent Violet 9	04	1015.000
Solvent Violet 13	04	1016.000
Solvent Violet 14	04	1017.000
Solvent Violet 38	04	1018.038
Solvent violet dyes, all other	04	1019.000
Solvent Yellow 3	04	957.000
Solvent Yellow 13	04	958.000
Solvent Yellow 14	04	959.000
Solvent Yellow 16	04	959.016
Solvent Yellow 33	04	963.000
Solvent Yellow 42	04	966.000
Solvent Yellow 43	04	967.000
Solvent Yellow 44	04	968.000
Solvent Yellow 47	04	970.000
Solvent Yellow 56	04	971.000
Solvent Yellow 72	04	973.000
Solvent Yellow 94	04	974.094
Solvent Yellow 107	04	975.000
Solvent Yellow 131	04	975.131
Solvent Yellow 135	04	975.135
Solvent Yellow 143	04	975.143
Solvent Yellow 160	04	975.160
Solvent Yellow 161	04	975.161
Solvent Yellow 163	04	975.163
Solvent yellow dyes, all other	04	976.000
Sorbic acid (2,4-Hexadienoic acid)	15	578.000
Sorbitol (70% by weight)	15	1094.000

APPENDIX D

Table 4—Continued
Alphabetical chemical index

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Chemical name	Sect. No.	Item No.
Sorbitol, ethoxylated	15	1189.000
Sorbitol, propoxylated	15	1190.000
Soya fatty acids, reaction products with chloromethane and diethylenetriamine, ethoxylated, quaternized	12	477.350
Soya fatty acids, reaction products with chloromethane and diethylenetriamine, propoxylated, quaternized	12	477.360
Soya sterols, ethoxylated	12	754.700
Soybean oil acids (Ratio=2/1)	12	541.500
Soybean oil acids (Ratio=1/1)	12	549.300
Soybean oil acids, potassium salt	12	67.000
(Soybean oil alkyl)amine	12	427.000
(Soybean oil alkyl)amine, ethoxylated	12	335.000
N-(Soybean oil alkyl)trimethylenediamine	12	414.000
Soybean oil, ethoxylated	12	672.000
Soybean oil, sulfated, sodium salt	12	312.000
Spectinomycin (medicinal grade)	06	57.000
Spironolactone	06	740.500
Stannous 2-ethylhexanoate	15	643.000
Stannous octanoate	15	715.000
Stannous octyl phthalate	15	164.300
Stanozolol	06	641.600
Stearamide (Octadecane amide)	15	253.000
Stearamidoethyldiethylamine	12	388.900
Stearamidoethylethanolamine acetate	12	388.950
Stearamidoethyl-2-heptadecyl imidazoline	12	414.500
Stearamidopropylidimethylcetylammmonium tosylate and propylene glycol	12	477.390
Stearic acid (Ratio = 2/1)	12	542.000
Stearic acid (Ratio = 1/1)	12	565.000
Stearic acid (Ratio = 2/1)	12	562.000
Stearic acid (Ratio = 1/1)	12	550.000
Stearic acid aminoethanolamine (amine acid ratio = 1.0/1.65)	12	575.450
Stearic acid-aminoethyl ethanolamine (amine/acid ratio=1.75/1.0)	12	575.500
Stearic acid-N-aminoethyl ethanolamine condensate	12	581.200
Stearic acid, ammonium salt	12	67.990
Stearic acid diethanolamine (amine acid ratio = 1.0/11.6)	12	575.550
Stearic acid, diethanolamine condensate, methyl sulfate	12	389.500
Stearic acid-diethylenetriamine condensate	12	367.000
Stearic acid-diethylenetriamine condensate, ethyl sulfate	12	367.500
Stearic acid, N,N-dimethylamino-propylamine condensate	12	369.600

Chemical name	Sect. No.	Item No.
Stearic acid esters, all other	11	125.000
Stearic acid, ethoxylated	12	671.700
Stearic acid - ethylenediamine condensate	12	368.290
Stearic acid-ethylenediamine condensate amine/acid ratio=1/2	12	586.000
Stearic acid-ethylenediamine condensate, monoethoxylated	12	382.000
Stearic acid-ethylenediamine condensate, monoethoxylated, ethyl sulfate	12	368.300
Stearic acid ethylene diamine methyl ammonium sulfate	12	501.500
Stearic acid mixed amine condensate	12	369.500
Stearic acid monoethanolamine condensate	12	581.500
Stearic acid, potassium salt	12	68.000
Stearic acid, sodium salt	12	69.000
Stearic acid-tetraethylenepentamine condensate	12	370.000
Stearic acid,N,N,N',N'-tetrakis(2-hydroxyethyl)-ethylenediamine salt	12	33.000
Stearic acid, triethanolamine salt	12	34.000
Stearonitrile (Octadecane nitrile)	15	451.000
N-Stearoyl-p-aminophenol	09	104.000
Stearyl acid phosphate	15	1035.300
Stearyl alcoholand ethoxylated ceteryl alcohol	12	754.800
Stearyl alcohol, propoxylated	12	733.310
Stearyl alcohol, propoxylated	12	738.700
Stearylamidopropylidimethyl amine	12	388.200
Stearylamidopropyl dimethyl myristyl acetate ammonium chloride	12	477.400
Stearyl amine polyphosphoric acid, ethoxylated	12	112.810
Stearyl dimethylammmoniummethosulfate quaternary	12	465.850
Stearylceramide	15	254.000
Stearyl methacrylate	15	1053.000
Stearyl pyridium chloride	12	501.550
Stearyl stearamide	15	254.200
Straight polystyrene	08	44.030
Streptomycin	06	76.000
Streptozocin	06	279.500
Strontium naphthenate	14	313.000
Strontium stearate	15	762.200
Styrenated-alkyds, or copolymer alkyds	08	3.500
Styrene (Vinylbenzene)	03	1411.000
Styrene-acrylonitrile copolymer resins (SAN)	08	43.000
Styrene-allyl alcohol copolymer resins	08	44.043
Styrene-butadiene, dry type	10	3.100
Styrene-butadiene latexes	08	44.060
Styrene-butadiene, latex type	10	3.500
Styrene-butadiene type elastomers, other	10	4.500
Styrene-butadiene-vinylpyridine	10	4.000
Styrene copolymers, all other	08	44.049

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 4—Continued
Alphabetical chemical index

Chemical name	Sect. Item	
	No.	No.
Styrene-divinylbenzene copolymer resins	08	44.044
Styrene latexes, all other	08	44.080
Styrene-maleic anhydride copolymer resins	08	44.045
Styrene-maleic anhydride copolymer, sulfonated, sodium salt	12	214.100
Styrene-methyl methacrylate copolymer resins	08	44.047
Styrene oxide	15	165.000
Styrene type plastics materials, all other	08	45.500
Succinaldehyde-sodium bisulfite complex	15	803.400
Succinic anhydride	15	165.500
Succinylcholine chloride	06	480.000
Succinyl peroxide	15	1296.500
Sucrose acetate isobutyrate	11	126.000
Sucrose benzoate	15	166.000
Sucrose octa-acetate	15	1133.000
Sufentanil citrate	06	414.300
Sulfabenzamide	06	208.000
Sulfacetamide, sodium	06	212.000
Sulfadiazine	06	215.000
Sulfadiazine, silver	06	215.200
Sulfadimethoxine	06	217.000
Sulfaguanidine	03	1412.200
Sulfamethazine	06	221.000
Sulfamethazine, sodium	06	222.000
Sulfamethizole	06	223.000
Sulfamethoxazole	06	224.000
Sulfantran	06	227.000
Sulfasalazine	06	232.000
Sulfated animal fats and oils, all other	12	297.000
Sulfated ethers, all other	12	283.000
Sulfated fish and marine fat oils, all other	12	304.000
Sulfathiazole, sodium	06	234.000
Sulfisoxazole	06	235.000
Sulfisoxazole, acetyl	06	201.000
5-Sulfisophthalic acid, 1,3-dimethyl ester	03	1417.000
5-Sulfisophthalic acid, 1,3-dimethyl ester, sodium salt	03	1417.100
5-Sulfisophthalic acid, sodium salt	03	1417.500
Sulfonic acids, all other	12	215.000
Sulfonic acids having amide linkages, all other	12	189.000
Sulfonic acids with ether linkages, all other	12	209.000
4-Sulfophthalic acid	03	1421.000
Sulfosuccinic acid, bis(dilsobutyl)ester, amidodisodium salt	12	190.000
Sulfosuccinic acid, bis(2,6-dimethyl-4-heptyl)ester, sodium salt	12	191.000
Sulfosuccinic acid, bis(2-ethylhexyl)ester, sodium salt	12	192.000
Sulfosuccinic acid, dihexyl ester, sodium salt	12	194.000

Chemical name	Sect. Item	
	No.	No.
Sulfosuccinic acid, dilsodecyl ester, sodium salt	12	194.200
Sulfosuccinic acid, dilsooctyl ester, sodium salt	12	194.220
Sulfosuccinic acid, dioctyl ester, sodium salt	12	194.300
Sulfosuccinic acid, dipentyl ester, sodium salt	12	195.000
Sulfosuccinic acid, ditridecyl ester, sodium salt	12	196.000
Sulfosuccinic acid, (lauryl polyethylene glycol ether) ester, disodium salt	12	196.450
Sulfosuccinic acid esters, all other	12	197.000
Sulfosuccinic acid, (coconut oil alkyl)iminisopropanol half-ester, sodium salt	12	193.400
Sulfosuccinic acid, monolauramide ester, disodium salt	12	196.475
Sulfosuccinic acid, monolaurate ester, disodium salt	12	196.495
Sulfosuccinic acid, monolauryl(polyethoxy)ester, disodium salt	12	196.500
Sulfosuccinic acid, monooleamidopolyethyleneglycol ester, disodium salt	12	196.515
Sulfosuccinic acid myristyl ester disodium monoethanolamine salt	12	196.580
Sulfosuccinic acid, nonoxynyl-10 ester, disodium salt	12	196.570
Sulfosuccinic acid, oleamidopolyethyleneglycol, disodium salt	12	196.600
Sulfoxone, sodium	06	149.000
Sulfur Black 11, 11:1	04	1114.000
Sulfur brown dyes, all other	04	1105.000
Sulfur compounds, all other	14	264.000
Sulfur green dyes, all other	04	1088.000
Sulfuric acid esters, all other	12	317.000
Sulfurized corn oil	15	1330.050
Sulfurized lard oil	14	200.000
Sulfurized sperm oil substitutes	14	202.000
Sulfur Orange 1	04	1066.000
Sulfur Red 10	04	1070.000
Sulfur yellow dyes, all other	04	1065.000
Sulindac	06	414.500
Sympathomimetic (adrenergic) agents, all other	06	349.000
Synthetic sweetener material, all other	07	88.000
Tall oil acids (Ratio = 2/1)	12	543.000
Tall oil acids	12	551.000
Tall oil acids	12	74.100
Tall oil acids/aminoethylpiperazine condensate	12	370.900
Tall oil acids, diethanolamine salt (condensate)	12	34.300
Tall oil acids-diethylenetriamine condensate	12	371.000
Tall oil acids, ethoxylated	12	672.400
Tall oil acids, ethoxylated and propoxylated	12	672.420
Tall oil acids-mixed polyamine condensate	12	371.800
Tall oil acids-polyalkylenepolyamine condensate	12	372.000

Table 4—Continued
Alphabetical chemical index

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Chemical name	Sect. No.	Item No.
Tall oil acids—polyalkylene polyamine condensate, salts, with dodecylbenzene sulfonic acid and/or tall oil fatty acids	12	372.010
Tall oil acids, potassium salt	12	70.000
Tall oil acids, sodium salt	12	71.000
Tall oil acids, sulfated, sodium salt	12	268.700
(Tall oil alkyl)amine	12	428.000
3-(Tall oil amino)propyl amine	12	414.600
Tall oil, chemically modified	15	168.000
Tall oil fatty acid, diethylene triamine condensate (amine/acid ratio=1/2)	12	587.450
Tall oil fatty acids (Ratio = 1/2)	12	555.300
Tall oil fatty acids (ratio = 2.7/1)	12	555.310
Tall oil fatty acids (ratio = 1.5/1)	12	555.305
Tall oil fatty acids, polymerized	15	167.600
Tall oil fatty acids—triethanolamine condensate	12	575.600
Tall oil, refined, ethoxylated	12	672.500
Tall oil salts, all other (Linoleic-rosin acid salts)	15	179.000
Tall oil, sulfated, ammonia salt	12	312.500
Tall oil, sulfated, sodium salt	12	312.700
Tallow acids (Ratio = 2/1)	12	544.000
Tallow acids	12	552.000
Tallow acids (amine/acid ratio=1.00/1.65)	12	567.450
Tallow acids, potassium salt	12	72.000
Tallow acids, sodium salt	12	73.000
Tallow acids, triethanolamine salt	12	34.500
Tallow alcohol, ethoxylated	12	740.000
Tallow alkyl amide, ethoxylated	12	587.970
(Tallow alkyl)amine	12	429.000
(Tallow alkyl)amine acetate	12	399.000
(Tallow alkyl)amine, ethoxylated	12	336.000
(Tallow alkyl)amine, ethoxylated, diethosulfate	12	465.940
N-(Tallow alkyl)dipropylenetriamine	12	415.000
N-(Tallow alkyl)-3-iminodipropionic acid, disodium salt	12	18.000
N-(Tallow alkyl)trimethylenediamine	12	416.000
N-(Tallow alkyl)trimethylenediamine acetate	12	400.000
N-(Tallow alkyl)trimethylenediamine, ethoxylated	12	337.000
N-(Tallow alkyl)trimethylenediamine oleate	12	402.000
Tallow amide, hydrogenated	15	255.000
Tallow amine, ethoxylated, quarternary ammonium salt	12	477.700
Tallow, n- 3-(dimethylamino)propyl ⁺ (amine/acid ratio=1/3)	12	587.600
[Tallow ethyl alkyl]amine, ethoxylated, sulfate	12	336.020
Tallow fatty acids—ethanolamine condensate, ethoxylated	12	581.700
Tallow fatty acids, ethoxylated	12	672.600
Tallow nitrile	15	453.000
Tallow nitrile, hydrogenated	15	454.000

Chemical name	Sect. No.	Item No.
Tallow, sulfated, sodium salt	12	295.000
Tannic acid, N.F.	15	180.000
Tar bases: crude bases (dry basis)	01	10.000
Tar bases: semirefined or denaturing grade	01	11.000
Tar distillates, all other	01	22.000
Tar for other uses: crude	01	24.000
Tar for other uses: refined	01	25.000
Tar, road	01	23.000
Tepyl acetate	07	169.000
Terazosin	06	359.900
Terbutaline sulfate	06	347.500
Terephthalic acid	03	1422.000
Terephthalic acid, dimethyl ester	03	1424.000
Terephthaloyl chloride	03	1424.500
Terephthaloyl chloride	15	181.000
Terephthaloyldiacetic acid, diethyl ester	03	1425.000
Terfenadine	06	109.000
Terpene hydrocarbons, monocyclic (Solvenol)	15	182.000
Terphenyl (Phenylbiphenyl) (m-, o-, and p-isomers)	03	1426.000
Terpinene-ol	07	116.500
Terpinene-4-ol	03	1426.500
Terpineol(α- and β-)	07	119.000
α-Terpineol	07	117.000
Terpineol	15	182.700
α-Terpinyl acetate	07	120.000
α-Terpinyl propionate	07	121.000
1-Tert-butyl-2,5-dimethoxybenzene	03	377.500
Tert butyl urea	15	329.500
Tertiary amyl per-2-ethylhexanoate	15	1283.200
Tertiary butyl ethanolamine	15	327.900
Testosterone	06	641.800
Testosterone cypionate	06	642.000
Testosterone enanthate	06	642.100
Testosterone propionate	06	642.300
Tetrabromobisphenol A	15	184.000
1,1,2,2-Tetrabromoethane (Acetylene tetrabromide)	15	1214.000
Tetrabromophthalic anhydride	03	1429.000
Tetrabutylammonium bromide	12	501.600
Tetrabutyl titanate	15	1060.000
cis-N-[(1,1,2,2-Tetrachloroethyl)thio]-1-cyclohexene-1, 2-dicarboximide (Captafol)	13	31.050
2,4,5,6-Tetrachloroisophthalonitrile	13	31.200
1,2,4,5-Tetrachloro-3-nitrobenzene	03	1435.000
Tetrachlorophthalic anhydride	03	1435.600
Tetracycline	06	37.000
1-Tetradecanaminium, N,N,N-trimethyl-chloride	12	501.604
n-Tetradecane	15	1348.500

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 4—Continued
Alphabetical chemical index

Chemical name	Sect. No.	Item No.
1-Tetradecanol (Myristyl alcohol)	15	879.000
n-Tetradecenylsuccinic anhydride	15	185.500
3-Tetradecylaminopropyl amine	12	416.200
Tetradecyl mercaptan	09	171.200
Tetra-(2,2-diallyloxymethylene)-1-butoxy titanium bis-(dtridecyl) phosphite	12	784.500
Tetraethylammonium bromide	12	501.610
Tetraethyl ammonium bromide	15	474.500
Tetraethyl ammonium chloride	12	501.612
Tetraethylene glycol	15	1191.000
Tetraethylene glycol diacrylate	15	1135.000
Tetraethylene glycol di(2-ethylhexanoate)	11	126.100
Tetraethylene glycol dimethacrylate	15	1136.000
Tetraethylenepentamine	15	303.000
Tetraethyl lead	14	186.000
O,O,O',O'-Tetraethyl S,S'-methylene bisphosphorodithioate (Ethion)	13	227.000
Tetraethyl orthosilicate (Tetraethyl silicate)	15	1054.000
Tetraethyl orthosilicate	15	1394.600
Tetraethyl silicate, condensed	15	1055.000
Tetrafluoroethylene, monomer	15	1270.000
Tetrafluoromethane	15	1271.000
Tetraheptyl ammonium bromide	12	501.635
Tetrahydro-allocimerol(50/50 mixture of tetrahydro linalool and tetrahydro-myrcenol)	07	169.140
Tetrahydrobenzyl alcohol	03	1437.402
Tetrahydro-3,5-dimethyl-4H-1,3,5-oxadiazine-4-thione	09	6.900
Tetrahydro-3,5-dimethyl-2(1H)-pyrimidinone[3-[4-(trifluoromethyl)phenyl]-1-[2-[4-(trifluoromethyl)phenyl]ethenyl]-2-propenylidene]hydrozone	13	166.028
Tetrahydro-3,5-dimethyl-2H-1,3,5-thiadiazine-2-thione (DMTT)	13	12.000
Tetrahydrofuran	03	1438.000
Tetrahydrofurfuryl alcohol	15	83.000
Tetrahydrofurfuryl oleate	11	53.000
Tetrahydrolinallyl alcohol (Tetrahydrolinool)	07	169.150
5,6,7,8-Tetrahydro-1-methoxy-3,5,5,8,8-pentamethyl naphthalene-z-carboxaldehyde	07	88.700
Tetrahydromyrcenol	07	169.170
1,2,3,4-Tetrahydronaphthalene (TetraIn)	15	186.000
1,2,3,4-Tetrahydronaphthalene	03	1438.253
Tetrahydropyrimidine from tall oil fatty acids and propylenediamine	14	174.000
Tetrahydrothiophene	15	187.000
Tetrahydrothiophene-1,1-dioxide (Sulfolane)	15	188.000
Tetra-isopropoxy titanium (bis dioctyl) phosphite	12	784.550
Tetraisopropyl titanate	15	1061.000

Chemical name	Sect. No.	Item No.
Tetrakis(2-chloroethyl)ethylene diphosphate	15	1035.500
Tetrakis(2-ethylhexyl)titanate	15	1062.000
N,N,N',N'-Tetrakis(2-hydroxyethyl)ethylenediamine	12	338.000
N,N,N',N'-Tetrakis(2-Hydroxyethyl)ethylenediamine, propoxylated	12	338.100
N,N,N',N'-Tetrakis(2-hydroxypropyl) ethylene diamine	12	337.590
N,N,N',N'-Tetrakis(2-hydroxypropyl)ethylenediamine, propoxylated and ethoxylated	12	339.000
Tetra methyl ammonium bromide	12	501.637
Tetramethylammonium chloride	12	501.638
1,2,4,5-Tetramethylbenzene (Durene)	03	1442.100
N,N,N',N'-Tetramethyl-1,3-butanediamine	15	304.000
p-(1,1,3,3-Tetramethylbutyl)phenol	03	1443.000
2,4,7,9-Tetramethyl-5-decyne-4,7-diol, ethoxylated	12	768.000
Tetramethylethylenediamine	15	305.000
Tetra(methyl-ethyl)lead, (Tel-tml,reacted)	14	187.000
Tetramethyl lead	14	188.000
Tetramethyl, octahydro acetophenone	07	88.800
Tetramethyl octahydro acetyl naphthalene	07	88.810
Tetramethyl silicate	15	1055.400
Tetramethylthiuram tetrasulfide	09	48.250
1,3,6,8-Tetranitro-9H-carbazole	03	1443.600
Tetranitromethane	15	478.050
Tetra octyloxy titanium (bis-tridecyl phosphite)	12	784.100
Tetrapropyl silicate	15	1055.500
Tetrahydrofurfurylamine	03	1438.050
Textile chemicals, other than surface active agents, all other	14	507.000
Thebaine	06	435.000
Theophylline sodium glycinate	06	748.600
Thermoplastic elastomers (such as styrene-block copolymers, thermoplastic olefin elastomers, and copolyester)	10	5.000
Thermoplastic resins, benzenoid, all other	08	52.000
Thermosetting acrylate resins	08	20.030
Thermosetting resins, benzenoid, all other	08	18.000
Thermosetting resins, nonbenzenoid, all other	08	18.100
Thiabenzazole	06	132.000
1,3,4-Thiadiazole, 2,5-bis(dialkylidithio) derivatives	14	290.000
Thiamine hydrochloride	06	804.000
Thiamine mononitrate	06	805.000
Thiamylal, sodium	06	463.000
Thiazole derivatives, cyclic, other	09	36.000
Thioacetic acid	15	581.000
Thiobis(methyltertiarybutyl phenol)	15	196.500
Thiocarbamide (Diphenylthiourea)	14	137.000
Thiocarbamide	09	48.300

Table 4—Continued
Alphabetical chemical index

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Chemical name	Sect. Item	
	No.	No.
Thiocyanic acid, methylene ester	13	207.500
2-(Thiocyanomethylthio)benzothiazole	13	40.018
2,2'-Thiodiethanol (Thiodiglycol)	15	1193.000
Thiodiglycol ethoxylated	12	768.500
Thiodiphenol	03	1452.500
O,O'-(Thiodi-4,1-phenylene)bis(o,o-dimethyl phosphorothioate (Temphos))	13	165.025
3,3'-Thiodipropionic acid	15	582.000
3,3'-Thiodipropionitrile	15	455.000
Thiodisuccinic acid	15	582.100
Thioguanine (hemihydrate)	06	280.000
Thioacetic acid	15	583.000
Thiopental, sodium	06	464.000
Thiophane (Tetrahydrothiophene)	02	96.095
Thiophene	15	198.000
2-Thiopheneacetic acid	03	1452.700
2-Thiopheneacetonitrile	03	1452.800
2-Thiopheneacetyl chloride	03	1452.900
Thiophenol	03	1453.100
Thiosemicarbazide	15	480.000
Thiostrepton	06	58.000
Thiothixene hydrochloride	06	509.000
Thiourea resins	08	17.010
Thyroglobulin	06	695.800
Thyroid	06	696.000
Ticarcillin, disodium	06	19.500
Ticarcillin, sodium	06	19.700
Timolol maleate	06	321.500
Tin carboxylate	15	1404.930
Tin laurate	15	677.800
Titanic acid esters, all other	15	1063.000
Titanium acetylacetonate complex	15	1407.250
N-2(C ₈ to C ₁₇)alkylamido-N-carboxyethyl,N-2 hydroxyethyl, 3-amino-2-hydroxypropyl phosphate, disodium salt	12	102.600
Tobramycin	06	4.001
Tocainide	06	383.001
d- α Tocopherol	06	815.000
dl- α Tocopherol	06	816.000
d- α Tocopheryl acetate	06	817.000
dl- α Tocopheryl acetate (animal feed grade)	06	818.000
dl- α Tocopheryl acetate (medicinal grade)	06	819.000
d- α Tocopheryl acid succinate	06	821.000
Tolazamide	06	689.000
p-Tolaldehyde	07	89.000
Toluene (Toluol) 90-100%	01	4.000
Toluene-2,3-(and 3,4)-diamine (35/65 Mixture)	03	1454.803

Chemical name	Sect. Item	
	No.	No.
Toluene-2,4-diamine (4-m-Tolylenediamine)	03	1455.000
Toluene-2,4-(and 2,6)-diamine (80/20 Mixture)	03	1455.313
Toluene-3,4-diamine	03	1455.402
Toluenediamine-bis-maleimide	03	1455.500
Toluene 2,4-and 2,6-diisocyanate (80/20 Mixture)	03	1025.600
Toluene high purity (98-100%)	02	27.500
Toluene other	02	28.500
Toluenesulfonamide o-, p-mixtures	11	54.000
p-(p-Toluenesulfonamido)diphenylamine	09	83.000
p-Toluenesulfonic acid	03	1461.000
p-Toluenesulfonic acid, aniline salt	03	1461.300
p-toluenesulfonic acid, copper salt	03	1461.400
p-Toluenesulfonic acid monohydrate	03	1464.000
Toluenesulfonic acid, potassium salt	12	146.000
Toluenesulfonic acid, sodium salt	12	147.000
o-Toluenesulfonyl chloride	03	1466.000
p-Toluenesulfonyl chloride	03	1467.000
p-Toluenesulfonylhydrazide	09	110.743
p-Toluenesulfonyl isocyanate	03	1025.700
p-Toluenesulfonylsemicarbazide	09	109.800
Toluene xylene sulfonic acid	12	147.500
m-Toluic acid	03	1469.000
o-Toluidine	03	1473.000
m-Toluidine	03	1472.000
p-Toluidine	03	1474.000
m-Toluidine, ethoxylated	12	356.200
o-Toluidinomethanesulfonic acid	03	1480.000
m-Toluidinomethanesulfonic acid	03	1479.000
p-Tolylacetaldehyde	07	89.600
p-Tolyl acetate	07	90.000
2,2'-(m-Tolylimino)diethanol	03	1487.000
2,2'-(m-Tolylimino)diethanol, diacetate ester	03	1487.100
p-Tolyl isobutyrate	07	90.100
p-Tolyl octanoate	07	90.400
p-Tolylphenylacetate	07	90.600
Tolyltriazole	03	1487.700
Toxaphene (Chlorinated camphene)	13	145.000
Tretinoin (vitamin A acid)	06	770.000
Trialkyl phosphite	15	1036.000
Triallyl cyanurate	15	200.000
Triamcinolone	06	667.000
Triamcinolone acetonide	06	668.000
Triamcinolone diacetate	06	669.000
2,4,6-Triamino-5-nitrosopyrimidine	03	1487.802
Triamterene	06	741.000
Triaryl phosphites	09	86.500
Triazolam	06	509.100

SYNTHETIC ORGANIC CHEMICALS, 1986

Table 4—Continued
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Chemical name	Sect. Item	
	No.	No.
1,2,4-Triazole	15	200.200
Tribasic lead maleate	15	689.000
2,4,6-Tribromophenol	03	1488.289
3,4',5-Tribromosalicylanilide	03	1489.000
Tri(2-butoxyethyl) phosphate	11	102.000
Tributyl acetylcitrate	11	71.100
Tri-n-butyl aluminum	15	1363.950
Tri-n-butyl aluminum	15	1365.001
Tri-n-butylamine	15	266.000
Tributyl citrate	11	71.200
Tributylmethylammonium chloride	12	501.750
Tributyl phosphate	11	105.010
Tributyl phosphate	15	1039.000
Tributyl phosphite	14	289.000
S,S,S-Tributyl phosphorotrithioate	13	208.000
Tributyl phosphorotrithioate (Merphos)	13	209.000
Tributyltin benzoate	15	202.500
Tributyltin chloride	13	195.016
Tributyltin fluoride	15	1406.000
Tributyltin propylene glycol maleate	15	1406.200
Tri(castor oil alkyl)phosphate	12	786.000
Trichlormethiazide	06	726.000
S-(1,2,3-Trichloroallyl) diisopropylthiocarbamate (Triallate)	13	211.000
1,2,3(and 1,2,4)-Trichlorobenzene	03	1490.000
1,2,4-Trichlorobenzene	03	1491.000
1,1,1-Trichloro-2,2-bis(p-methoxyphenyl)ethane (Methoxychlor)	13	146.000
3,4,4'-Trichlorocarbanilide	15	203.000
1,1,1-Trichloro-2,2-diphenylethane	03	1492.200
1,1,1-Trichloroethane (Methyl chloroform)	15	1245.000
1,1,2-Trichloroethane (Vinyl trichloride)	15	1246.000
Trichloroethylene	15	1247.000
Tri(2-chloroethyl) phosphate	11	102.200
Trichlorofluoromethane	15	1272.000
α-(Trichloromethyl)benzyl acetate (Rosetone)	07	91.000
Trichloromethyl chloroformate	15	1063.800
Trichloromethylsilane	15	1394.000
3-Trichloromethyl-1,2,4-thiadiazole	03	1492.500
N-Trichloromethylthio-4-cyclohexene-1,2-dicarboximide (Captan)	13	34.000
N-Trichloromethylthiophthalimide (Folpet)	13	35.000
1,2,4-Trichloro-5-nitrobenzene	03	1493.000
Trichloronitromethane (Chloropicrin)	13	242.000
Trichlorophenylsilane	03	1494.000
1,2,3-Trichloropropane	15	1248.000
1,2,3-Trichloropropene	15	1249.000

Chemical name	Sect. Item	
	No.	No.
Tri(2-chloropropyl) phosphate	11	102.400
Trichloropropylsilane	15	1395.000
3,5,6-Trichloro-2-pyridinyloxyacetic acid	13	118.064
α,α,α-Trichlorotoluene (Benzotrichloride)	03	1495.000
2,4,6-Trichloro-s-triazine (Cyanuric chloride)	03	1499.000
1,3,5-Trichloro-s-triazine-2,4,6-(1H,3H,5H)trione (Trichloroisocyanuric acid)	15	204.000
Trichlorotrifluoroethane	15	1273.000
Trichlorovinylsilane	15	1396.000
Tricresyl phosphate	11	14.000
Tricyclohexyltin hydroxide	13	166.031
1-Tridecanol	15	880.000
Tridecyl alcohol, ethoxylated and phosphated, polyalkylene polyamine salt	12	90.010
Tridecyl alcohol, ethoxylated	12	769.000
Tridecyl alcohol, ethoxylated and carbonated, sodium salt	12	319.000
Tridecyl alcohol, ethoxylated and phosphated	12	90.000
Tridecyl alcohol ethoxylated and phosphated, potassium salt	12	90.020
Tridecyl alcohol, ethoxylated and phosphated, trietanolamine salt	12	90.050
Tridecyl alcohol, ethoxylated and sulfated, ammonium salt	12	281.000
Tridecyl alcohol, ethoxylated and sulfated, sodium salt	12	282.000
Tridecyl alcohol, phosphated, potassium salt	12	90.100
Tridecyl alcohol, propoxylated and ethoxylated	12	770.000
Tridecylbenzenesulfonic acid	12	139.100
Tridecylbenzenesulfonic acid, sodium salt	12	139.200
Tridecyloxypoly(ethyleneoxy)acetic acid, sodium salt	12	50.000
Tridecyloxypoly(ethyleneoxy)propionic acid, potassium salt	12	18.500
Tridecylphenol, ethoxylated	12	756.000
Tridecyl phosphate	12	110.300
Tridecyl stearate	15	980.000
Tridecyl stearate	11	124.800
Tridecyl sulfate, sodium salt	12	246.000
Tridihexethyl chloride	06	293.900
Tri(dimethylaminomethyl)phenol	03	1499.208
Tri(2,4-ditertiarybutyl phenyl) phosphite	15	204.500
Triethanolamine	15	381.000
Triethanolamine, ethoxylated	12	340.000
Triethanolamine phosphate, sodium salt	14	89.000
Triethanolamine salicylate	12	340.100
Triethanolamine titanate	15	1062.500
Triethyl acetylcitrate	11	71.300
Triethylaluminum	15	1364.000

Table 4—Continued
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Chemical name	Sect. Item	
	No.	No.
Triethylamine	15	279.000
Triethylborane	15	1368.800
Triethyl borate	15	1368.804
Triethylboron	15	1368.830
Triethyl citrate	11	71.400
Triethylene diamide	15	255.500
Triethylene glycol	15	1194.000
Triethylene glycol di(caprylate-caprate)	11	127.000
Triethylene glycol di(2-ethylbutyrate)	11	128.000
Triethylene glycol di(2-ethylhexanoate)	11	129.000
Triethylenetetramine	15	306.000
Tri(2-ethylhexyl) trimellitate	11	54.750
Triethyl orthoacetate	15	1064.000
Triethyl orthoformate	15	1065.000
Triethyl orthopropionate	15	1066.000
Triethyl phosphate	11	103.000
Triethyl phosphite	15	1040.000
Triethyltrimethylenetriamine	09	7.000
Trifluoroacetic acid	15	584.009
Trifluoroacetic anhydride	15	584.010
α, α, α -Trifluoro-2,6-dinitro-N,N-dipropyl-p-toluidine (Trifluralin)	13	116.000
α, α, α -Trifluoro-2,6-dinitro-N-ethyl-N-(2-methyl-2-propenyl)-p-toluidine (Ethylfluralin)	13	116.100
Trifluoroethanol	15	1273.490
Trifluoroethyl methacrylate	15	1066.130
Trifluoropropene	15	1273.550
Tri-n-hexyl aluminum	15	1364.900
Tri-n-hexyltrimellitate	11	54.850
Trihexyphenidyl hydrochloride	06	305.000
Tri(hydrogenated tallow) amine	12	446.050
Trihydrogenated tallow ammonium chloride	12	501.800
Trisobutylaluminum	15	1365.000
Trisobutylene polysulfide	14	263.000
Trisodecylamine	12	444.300
Trisodecyl trimellitate	11	54.900
Trisononyl trimellitate	11	54.950
Triso-octyl phosphite	15	1041.000
Triso-octyl trimellitate	11	55.000
1,3,5-Tri(2-isopropanol)-s-triazine	13	40.150
Trisopropylamine	15	409.000
Trisopropyl phosphite	15	1042.000
Trilaurylamine	12	444.600
Trimellitic acid esters, all other	11	57.000
Trimellitic anhydride, acid chloride	03	1509.100
Trimellitic trichloride	03	1509.300
Trimer dibasic acids	15	584.100

Chemical name	Sect. Item	
	No.	No.
Trimesic acid	03	1510.000
Trimethobenzamide hydrochloride	06	82.000
Trimethoprim	06	275.000
Trimethoxyboroxine	15	1369.000
Trimethylaluminum	15	1366.000
Trimethyl amine	15	292.000
Trimethylamine hydrochloride	15	483.375
1,2,4-Trimethylbenzene (Pseudocumene)	03	1513.000
1,3,5-Trimethylbenzene (Mesitylene)	03	1513.100
Trimethyl benzyl dioxane	07	91.070
Trimethyl borate	15	1370.000
Trimethyl-cyclododeca-trienyl ethanone	07	169.700
Trimethyl-1-cyclohexane	15	206.940
3,3,5-Trimethylcyclohexanol (m-Homomenthol)	15	206.950
3,3,5-Trimethyl cyclohexanol (m-Homomenthol)	07	121.800
Trimethyl cyclohexene carboxaldehyde	07	121.750
3,5,5-Trimethyl-2-cyclohexene-1-one (Isophorone)	15	207.000
Trimethyl cyclohexenyl butenone	07	121.850
1-(2,6,6-Trimethyl-2-cyclohexen-1-yl)-1,6-heptadien-3-one (Allyl- α -ionone)	07	122.000
Trimethylcyclohexyl salicylate	07	91.080
Trimethyl-dodecyl ammonium chloride	12	501.900
Trimethylheptanol, ethoxylated	12	772.000
3,5,5-Trimethyl hexanal	07	169.500
1,1,3-Tri(2-methyl-4-hydroxy-5-tert-butylphenyl)butane	09	95.000
1,3,3-Trimethyl- δ^2 , α -indolineacetaldehyde	03	1515.000
N,N,N-Trimethyl methanaminium octahydrotriborate	15	1370.500
Trimethyl-p-methylbenzyl ammonium chloride	12	478.100
2,6,8-Trimethyl-4-nonanol	15	881.000
2,6,8-Trimethyl-4-nonanone (isobutyl heptyl ketone)	15	838.000
Trimethylnonyl alcohol, ethoxylated	12	773.000
Trimethyl norbornane methanol	07	122.020
Trimethyloctadecylammonium chloride	12	503.000
Trimethylolpropane, alkoxylated	12	774.000
Trimethylol propane ester	14	291.000
Trimethylolpropane ethoxylate triacrylate	15	1139.400
Trimethylolpropane triacrylate	15	1140.000
Trimethylolpropane triacrylate, ethoxylated	15	1140.015
Trimethylolpropane trilaurate (TMP trilaurate)	15	1194.700
Trimethylolpropane tri(2-mercaptopropionate)	15	1140.005
Trimethylolpropane trioleate	11	95.700
Trimethylolpropane trioleate (TMP trioleate)	15	1140.300
Trimethyl orthoacetate	15	1066.200
Trimethyl orthoformate	15	1068.000
2,2,4-Trimethylpentane (iso-octane)	02	76.000
2,2,4-Trimethyl-1,3-pentanediol	15	1095.000
2,2,4-Trimethyl-1,3-pentanediol diisobutyrate	11	129.600

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Table 4—Continued
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Chemical name	Sect. No.	Item No.
Trimethylpentanediol, ethoxylated	12	773.500
2,2,3-Trimethyl-1,3-pentanediol monoisobutyrate	15	1140.500
2,3,5-Trimethylphenol	13	166.033
Trimethylphenylammonium chloride	03	1516.100
Trimethyl phosphite	15	1043.000
Trimethyl(soybean oil alkyl) ammonium chloride	12	504.000
Trimethylsulfonium iodide	15	1420.500
Trimethyl(tallow alkyl) ammonium chloride	12	505.000
Trimethyl trimellitate	11	55.400
α, α -5-Trimethyl-5-vinyl-furfuryl alcohol and tetrahydro 2,2,6-trimethyl-6-vinyl-3-ol	07	122.200
5-(2,2,3-Trimethyl(cyclopent-3-en-1-yl)-3-methylpentan-2 ol	07	122.010
2,4,6-Trinitroresorcinol and lead derivative	15	208.000
Tri-n-octylaluminum	15	1366.400
Trioctylamine	12	445.000
Tri-n-octyl n-decyl trimellitate	11	55.600
Trioctyl phosphate	11	104.000
Trioctyl trimellitate	11	56.000
Tri-oxyaluminum tri-isopropoxide	15	1366.500
Tripelennamine	06	111.000
Tripelennamine citrate	06	112.000
Tripelennamine hydrochloride	06	113.000
Triptylamine	15	297.000
2,4,6-Triphenoxy-s-triazine	15	209.500
Triphenylmethane	03	1523.602
Triphenyl phosphate	11	15.000
Triphenylphosphine	03	1523.700
Triphenyl phosphite	15	210.000
Triphenyltin hydroxide	15	211.200
Triprolidine hydrochloride	06	114.000
Tri-n-propylaluminum	15	1366.700
Tripropylamine	15	302.000
Tripropylene glycol	15	1195.000
Tripropylene glycol diacrylate	15	1140.600
Tripropylene glycol monomethyl ether	15	1195.500
Tris(2-chloroethyl) phosphite	15	1044.000
Tris(chloroisopropyl) thionophosphate	15	1045.000
$\alpha, \alpha', \alpha''$ -Tris(dimethylamino)mesitol	03	1525.000
Tris(2-ethylhexyl) phosphite	15	1048.000
Tris(2-methoxyethoxy)vinyl silane	15	1398.600
Tris(2-methyl-1-aziridinyl)phosphine oxide	03	1526.000
Tris(pentamethyldisiloxanyl)-3-methacrylatopropylsilane	15	1397.500
Tristearyl citrate	15	1068.500
Tri- and tetraethyle glycol monoethyl ethers, borate ester s	15	1193.800
Tri(tridecyl)amine	12	446.100

Chemical name	Sect. No.	Item No.
Tubocurarine	06	481.000
Tylosin	06	77.000
Undecanal	07	170.000
Undecanol (linear C ₁₁ alcohol)	15	869.700
9-Undecenal	07	171.000
Undecenal-10	07	171.010
Urea, 2-[(2-aminoethyl)amino]ethanol polymer, stearate	14	502.000
Urea-formaldehyde resins	08	17.000
Urea in feed compounds (100% basis)	14	509.000
Urea in liquid fertilizer (100% basis)	14	510.000
Urea in plastics (100% basis)	14	512.000
Urea in solid fertilizer (100% basis)	14	511.000
Urea polymers with formaldehyde and methanol	14	503.000
Urea, polymer with tetrakis[hydroxymethyl]phosphonium sulfate	14	506.000
Urea, primary solution (report on 100% urea-content basis)	14	508.000
7,7'-Ureylenebis[4-hydroxy-2-naphthalenesulfonic acid] (J-Acid urea)	03	1528.000
Uricase	14	128.000
Valeraldehyde (Pentanal)	15	804.000
Valeric acid	15	585.000
Valproic acid	06	423.900
Vancomycin	06	61.000
Vanillin propylene glycol acetal	07	44.400
Vat Black 16	04	1206.016
Vat Black 22, 19%	04	1208.000
Vat Black 25, 12-1/2%	04	1209.000
Vat Black 27, 12-1/2%	04	1210.000
Vat Blue 1, 20%	04	1164.000
Vat Blue 6, 8-1/3%	04	1167.000
Vat Blue 16, 16%	04	1171.000
Vat Blue 18, 13%	04	1172.000
Vat Blue 19	04	1172.019
Vat Blue 20, 14%	04	1173.000
Vat Blue 29	04	1173.029
Vat Blue 43	04	1175.000
Vat Blue 66	04	1175.066
Vat blue dyes, all other	04	1177.000
Vat Brown 1, 11%	04	1187.000
Vat Brown 3, 11%	04	1188.000
Vat Brown 11, 12%	04	1190.000
Vat Brown 13, 17%	04	1192.000
Vat Brown 57, 12.8%	04	1200.000
Vat Green 1, 6%	04	1178.000
Vat Green 3, 10%	04	1180.000
Vat Green 7	04	1180.007

Table 4—Continued
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Chemical name	Sect. Item	
	No.	No.
Vat Green 9, 12-1/2%	04	1183.000
Vat Orange 1, 20%	04	1129.000
Vat Orange 2, 12%	04	1131.000
Vat Orange 7, 11%	04	1136.000
Vat Red 1, 13%	04	1142.000
Vat Red 10, 18%	04	1144.000
Vat Red 13, 11%	04	1146.000
Vat Red 15, 10%	04	1148.000
Vat Red 32, 20%	04	1151.000
Vat red dyes, all other	04	1154.000
Vat Violet 13, 6-1/4%	04	1159.000
Vat Yellow 22, 10%	04	1126.000
Vat Yellow 33, 15%	04	1127.000
Vat yellow dyes, all other	04	1128.000
Vegetable glycerides, hydrogenated	15	1330.400
Veratraldehyde (3,4-Dimethoxybenzaldehyde)	03	1529.000
Very high molecular weight (>1000) hydrocarbons	14	292.000
Vetivenol	07	124.000
Vetivenyl acetate	07	125.000
Vinblastine sulfate	06	281.000
Vincristine sulfate	06	282.000
Vinyl acetate-acrylate copolymers	08	50.080
Vinyl acetate, monomer	15	1069.000
Vinylacetonitrile	15	456.000
Vinylbenzyl chloride	15	211.800
Vinyl bromide (Bromoethylene)	15	1215.000
Vinyl chloride-acetate copolymer resins	08	50.090
Vinyl chloride, monomer (Chloroethylene)	15	1250.000
Vinyl crotonate	15	1069.010
2-Vinylcyclohexene	03	1531.000
Vinylcyclohexene monoxide	03	1531.503
Vinyl fluoride, monomer	15	1274.000
Vinylidene chloride, monomer (1,1-Dichloroethylene)	15	1251.000
Vinylidene fluoride, monomer	15	1275.000
2-Vinylpyridine	03	1535.000
4-Vinylpyridine	03	1536.000
1-Vinyl-2-pyrrolidinone - other copolymers	15	216.000
1-Vinyl-2-pyrrolidinone-maleic anhydride copolymer	15	216.100
1-Vinyl-2-pyrrolidinone-methylacrylic acid, dimethylamine ethyl ester, copolymer	15	214.000
1-Vinyl-2-pyrrolidinone, monomer	15	215.000
1-Vinyl-2-pyrrolidinone, polymers	14	450.000
1-Vinyl-2-pyrrolidinone--vinyl acetate copolymer	15	217.000
Vinyl resins, all other	08	51.000
Vinyl toluene alkyds	08	3.800
Vinyltriethoxysilane	15	1398.000
Vinyl trimethoxy silane	15	1398.300
Violet 5:1	05	220.000
Vitamin A, all other	06	776.000

Chemical name	Sect. Item	
	No.	No.
Vitamin A acetate (animal feed grade)	06	771.000
Vitamin A acetate (medicinal grade)	06	772.000
Vitamin A alcohol	06	773.000
Vitamin A palmitate (medicinal grade)	06	775.000
Vitamin A propionate	06	775.500
Warfarin	06	632.000
Waxes and paraffinic products	09	178.800
Wool wax alcohols, ethoxylated	12	740.500
Xanthan gum	14	451.000
Xanthates and sulfides	14	146.000
o-Xylene (90-100% of o-xylene isomer)	03	1540.000
m-Xylene (90-100% of m-xylene isomer)	03	1539.000
p-Xylene (90-100% of p-xylene isomer)	03	1541.000
Xylene (Xylol): (90-100%)	01	6.000
Xylene high purity (98-100%)	02	30.500
Xylene other	02	31.500
2,4-Xylenesulfonic acid	03	1542.800
Xylenesulfonic acid, ammonium salt	12	148.000
Xylenesulfonic acid, mixed isomers	03	1543.502
Xylenesulfonic acid, sodium salt	12	150.000
2,6-Xylenol	03	1544.500
Xylenol, low boiling point	03	1545.000
Xylidine, original mixture	03	1550.000
Zeranol	06	643.000
Zinc acetate	15	606.000
Zinc acetylacetonate complex	15	1408.900
Zinc/calcium/cobalt neodecanoate	15	709.800
Zinc citrate	15	626.300
Zinc dialkyldithiophosphate	14	235.000
Zinc dialkylphenol dithiophosphate	14	236.000
Zinc dibutyl phosphorodithioate	14	239.000
Zinc disodecyl phosphorodithioate	14	241.000
Zinc 2-ethylhexanoate	15	644.000
Zinc gluconate	06	767.300
Zinc hydrocarbon dithiophosphate	14	242.000
Zinc isopropyl xanthate	09	154.800
Zinc laurate (Activator, physical property improver, and processing auxiliary)	09	179.000
Zinc naphthenate	14	315.000
Zinc neodecanoate	15	710.000
Zinc phenolsulfonate	06	560.000
Zinc salicylate	06	560.500
Zinc stearate	15	763.000
Zinc tallate	15	178.000
Zinc undecylenate	06	140.000
Zirconium acetate	15	607.000
Zirconium 2-ethylhexanoate	15	645.000
Zirconium neodecanoate	15	711.000
Zirconium acetylacetonate complex	15	1409.500

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