UNITED STATES TARIFF COMMISSION

SUMMARIES OF TRADE AND TARIFF INFORMATION

Prepared in Terms of the Tariff Schedules of the United States (TSUS)

Schedule 5

Nonmetallic Minerals and Products
(In 5 volumes)

Volume 2

Gems, Gemstones, Industrial Diamonds, Clays, Fluorspar, Talc, and Miscellaneous Nonmetallic Minerals and Products Thereof

TC Publication 235
Washington, D.C.
1968

UNITED STATES TARIFF COMMISSION

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Schedule 5

Volume 2

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F O R E W O R D

In an address delivered before a Boston audience on May 18, 1917, Frank W. Taussig, the distinguished first chairman of the Tariff Commission, delineated the responsibility of the recently established Commission to operate as a source of objective factual information on all aspects of domestic production and trade. As an initial step in meeting this obligation, the chairman stated, the Commission was preparing--

> a handy source of reference . . . designed to have on hand, in compact and simple form, all available data on the growth, development, and location of industries affected by the tariff, on the extent of domestic production, on the extent of imports, on the conditions of competition between domestic and foreign products.

The first such report was issued in 1920, and subsequent general issues of tariff summaries were published in 1921, 1929, and 1948-50.

In the 50 years since its establishment the Commission has been assigned many duties by the Congress, but the primary obligation for factfinding and production of information has remained a continuous major responsibility. Through its professional staff of commodity specialists, economists, lawyers, statisticians, and accountants, the Commission maintains constant surveillance of trade in the thousands of articles provided for in the Tariff Schedules of the United States. In its files and in the accumulated knowledge of its staff, the Commission has, therefore, built up a large reservoir of data and understanding not only with respect to imports but also with regard to significant developments affecting individual products and their uses and to processing and manufacturing techniques, business practices, and world trade. The publication of the present Summaries of Trade and Tariff Information will make available a current broad cross section of this information and understanding.

Every effort has been made to include all pertinent information in the summaries so that they will meet the needs of wide and varied interests that include the Congress, the courts, Government agencies, importers, business concerns, trade associations, research organizations, and many others. The structure of the individual summaries conforms generally with the earlier admonition of Chairman Taussig that the work "be exhaustive in inquiry, and at the same time brief and discriminating in statement." The scope of the entire project is encyclopedic, requiring concise and accurate descriptions of thousands of products, with indications of their uses, methods of production, number of producers, world supplies, and appraisals of their importance in trade and in our economy. In a society such as ours that has become progressively more dynamic, the task of sifting the essential from the nonessential has become both more difficult and more

important. Nevertheless, the summaries include substantive analytical material with regard to the basic factors affecting trends in consumption, production, and trade, and those bearing on the competitive position and economic health of domestic industries.

The publication of tariff summaries is particularly appropriate at this time. On August 31, 1963, the 16 schedules in titles I and II of the Tariff Act of 1930, certain import-excise provisions, other provisions of law, and some administrative practices were superseded by the Tariff Schedules of the United States (abbreviated to TSUS in these volumes). These changes resulted in an extensive regrouping of imports under 8 new tariff schedules and in modifications of the nomenclature and rates of duty for many articles. The summaries present for the first time full information on tariff items under the new structure, including import data derived through use of the Tariff Schedules of the United States Annotated (which comprises the legal tariff text plus statistical annotations).

Commodities are generally identified in the summaries in nontechnical language, which will meet most requirements. As an aid where more complete information is desired, the applicable legal language from the TSUS is reproduced in each volume as appendix A, which includes the article description, together with the general headnotes and rules of interpretation, and the directly applicable headnotes. Thus each volume will permit convenient reference to the statutory tariff language pertinent to the summaries it contains.

Publication of the 62 volumes projected for the series is scheduled under a program requiring several years for completion. Individual volumes, however, will be released as rapidly as they are prepared. For practical reasons the sequence of the summaries in the volumes does not necessarily follow the numerical sequence of the TSUS; however, all item numbers of the tariff schedules will be covered. The titles of the volumes to be issued for a particular TSUS schedule are set forth on the inside cover of the volumes for that schedule.

The Commission believes that the current series of summaries, when completed, will represent the most comprehensive publication of its kind and that the benchmark information it presents will serve the needs of many interests.

INTRODUCTION

This volume, identified as volume 5:2, is one of a series of 5 volumes on the nonmetallic minerals and products classified under schedule 5 of the Tariff Schedules of the United States (TSUS). Schedule 5 is divided into 3 parts, and this volume is one of two volumes that deal with the nonmetallic minerals and products classified in part 1 of schedule 5.

This volume comprises 29 summaries covering all nonmetallic minerals and products (except articles, not specially provided for of pumice), classifiable under subparts H, J, and K of part 1 of schedule 5. The complete list of these nonmetallic minerals and products is included in appendix A to this volume.

Subpart H of part 1 of schedule 5 covers inorganic gemstones and gems and synthetic gemstones and articles thereof, and natural and synthetic industrial diamonds. Classified elsewhere for tariff purposes are jewelry and related articles; cameos; natural, cultured, and imitation pearls; imitation gemstones; and beads and articles of beads. Also excluded from subpart H are: diamond grinding wheels and other abrasive articles, and abrasive materials other than industrial diamonds; jewel bearings; optical elements; and drills, recording or transcribing equipment, and other tools and instruments provided with one or more components of natural or synthetic gemstones. Subpart H recognizes, in headnote 2, the trade practice of designating as "precious stones" only diamonds, emeralds, rubies, and sapphires.

The United States is a substantial net importer of natural industrial diamonds (but not synthetic industrial diamonds) and practically all gems, gemstones, and articles thereof covered in subpart H; in 1965, imports of all these items combined amounted to about $380 million, while exports were valued at less than $100 million. Almost all of the exports represented the international flow of rough and cut gem diamonds, virtually all of which were initially produced in Africa.

Subpart J of part 1 of schedule 5 covers a number of specified nonmetallic minerals and certain nonmetallic mineral products; the most important imported into the United States in 1965 were fluorspar ($20 million), asphaltum, bitumen and limestone-rock asphalt ($15 million), calcined bauxite ($6 million), coal, coke, and compositions thereof ($3 million), and cryolite, china clay or kaolin, and nepheline syenite ($2 million each). The principal U.S. export items in this subpart in 1965 were coal ($522 million), diatomite ($10 million), china clay or kaolin, and bantonite ($6 million each), and asphaltum, bitumen and limestone-rock asphalt ($5 million).

Subpart K of part 1 of schedule 5 comprises two basket provisions covering nonmetallic minerals and products thereof, not specially provided for elsewhere in the TSUS. Some of the more important nonmetallic minerals and products thereof which have been imported into the United States are kyanite group minerals, vermiculite, pyrophyllite,

wonderstone, zircon flour, mullite, and roasted dolomite. So far as is known, none of the nonmetallic minerals or articles thereof classifiable in either of these provisions has been exported in any substantial amount, although there have been some exports of many of the individual items.

In appendix A to this volume, the TSUSA (1968) shows the concessions granted by the United States in the tariff negotiations concluded on June 30, 1967--commonly referred to as the Kennedy Round. Under the Trade Expansion Act of 1962 (76 Stat. 872), most U.S. concessions involving reductions in duty must be placed in effect in five stages. The first stage became effective on January 1, 1968, and subsequent stages will go into effect at annual intervals. In 1966, the imports of the products included in this volume on which concessions were granted were valued at just over $170 million and were dutiable at rates which averaged about 8 percent ad valorem. If the duty on these 1966 imports had been assessed on the basis of the final stage rates rather than the 1966 rates, the total amount of duty would have been reduced by about 50 percent.

Commodity	TSUS item
Precious and semiprecious stones (except industrial diamonds) not advanced in condition----------	520.11

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (1968).

U.S. trade position

The United States is dependent on imports for most of its commercial needs of precious and semiprecious stones. More than 98 percent, based on value, of the imported rough gem stones are diamonds. Exports consist mainly of gem stones sent overseas for cutting.

Description and uses

This summary covers rough precious and semiprecious natural stones, i.e., stones that have not been cut or advanced in condition or value or made into finished articles, except industrial diamonds. Industrial diamonds are covered in the summary of this volume on items 520.19-520.31; cut gem stones are included in the summary on items 520.32-520.39.

There is no clearly defined distinction in the trade between precious and semiprecious stones. For tariff purposes only diamonds, emeralds, rubies, and sapphires are "precious stones" and the term "semiprecious stones" is applied to a variety of other stones used in jewelry and objects of art. Among the better known semiprecious stones are agates, amethyst, aquamarine, jade, spinel, topaz, tourmaline, and zircon. The stones covered by this summary are practically all used as gems. For convenience, therefore, the term gem stones is used to refer to all the stones included herein.

Most gem stones are lustrous or brightly colored minerals found in rocks or soil at or near the surface of the earth. In varying degree they possess one or more of the following characteristics: Beauty, durability, and clarity. Notwithstanding their intrinsic transparency and depth of color, most of the beauty of gem stones is latent until brought out by cutting and polishing. Most, although not all, gem stones are hard enough to resist both abrasion and chemical attack and thereby tend to maintain a polish and luster. Of approximately 2,000 minerals occurring naturally in the earth's crust less than 100 have all of the attributes required in gem stones. The following tabulation shows nineteen principal mineral forms of precious and semiprecious gem stones with the correspondong gem names

and refractive indexes, listed in the order of their relative hardness (based on Mohs' scale) as published by the Jewelers' Circular Keystone:

Gem name	Mineral	Refractive index	Hardness
Diamond	Diamond	2.46	10
Sapphire, Ruby, Fancy sapphire	Corundum	1.76-7	9
Alexandrite, Catseye, Chrysoberyl	Chrysoberyl	1.74-5	8.5
Spinel	Spinel	1.72	8
Topaz	Topaz	1.61-2	8
Aquamarine, Emerald, Morganite, Golden beryl	Beryl	1.57-8	7.5-8
Almandine	Garnet	1.79	7.5
Zircon	Zircon	1.77-1.99	7.5
Tourmaline	Tourmaline	1.63-4	7-7.5
Garnet	Bohemian garnet	1.75	7.25
Amethyst, Agate, Onyz, Quartz Topaz, Rock crystal	Quartz 1/	1.54	7
Peridot	Chrysolite	1.65-9	7
Jade	Jadeite	1.66-8	6.5-7
Kunzite	Spodumene	1.66-7	6-7
New Zealand jade	Nephrite	1.60-3	6.5
Moonstone, Labradorite	Feldspar	1.53-4	6-6.5
Precious opal	Opal	1.45	5.5-6.5
Turquoise	Turquoise	1.63	6
Lapis lazuli	Lazulite	1.50	5-6

1/ Other gem names of quartz include bloodstone, carnelian, chalcedony, jasper, sardonyx, and tiger's eye.

Diamonds, which are pure carbon, are the hardest known substance. They are generally rarer than many other gem stones and are usually found only in small crystals. Crude gem stones occur in various sizes and qualities. Some of the finer specimens of "semiprecious" stones at times have a higher commercial value than some "precious" stones of comparable size.

The carat is the standard unit of weight for most gem stones. A carat is equal to 200 milligrams; 142 carats equal 1 troy ounce. Diamonds are also measured in terms of points with 100 points equaling 1 carat. Clarity refers to a stone's freedom from imperfections, such as specks of black carbon, other inclusions, internal cracks, or tiny bubbles. The refractive index of a gem stone is a measure of the extent to which a light ray is bent as it enters or leaves the stone. Generally, the higher the refractive index, the greater the brilliance of the stone.

Gem stones are used for personal adornment, as in necklaces, rings, and charms, or for decorative purposes as in the embellishment of objects of art or utility. At times people purchase precious stones (both crude and cut) because they embody wealth that can be easily transported or hidden and readily merchandised.

U.S. tariff treatment

The existing duty-free treatment was derived from paragraph 1668 and from paragraph 1603 (unmanufactured agates) of the original Tariff Act of 1930. The duty-free status of diamonds, rubies, sapphires, and semiprecious stones was bound by a concession granted by the United States in the General Agreement on Tariffs and Trade (GATT), effective January 1948; the duty-free status of unmanufactured agates was bound by a concession effective December 1953.

U.S. consumption, producers, and production

Although a number of the gem stones here under consideration are found in the United States they do not occur in quantities to justify commercial mining, and statistics on domestic production are not available. The domestic output of gem stones comes primarily from amateur prospectors and collectors who sell mostly to hobby and rock shops. According to the Bureau of Mines, in 1965 gem stones were produced in 38 States of which California, Oregon, Texas, Arizona, and Wyoming were the principal sources. As published by the Bureau, annual domestic output of gem stones, other than diamonds, during 1961-65 increased almost steadily from $1.3 million to $2.2 million and averaged $1.5 million (table 1). These are estimates based on a partial survey. There is no production in the United States of rough diamonds.

U.S. exports

Exports of gem stones other than diamonds are not separately shown in U.S. export statistics; they are believed to be small. Annual exports of rough diamonds during 1961-65 have fluctuated and ranged from 766,000 carats, valued at $24 million in 1961 to 1.7 million carats, valued at $58 million in 1964 (table 2).

The large exports of diamonds relative to imports resulted from practices peculiar to the trade in diamonds. Rough diamonds, as a rule, are not marketed individually but are sold (imported) in parcels containing stones of various sizes and qualities. Some of the stones are retained to be cut in this country; others are sent abroad to the Belgium and Israeli diamond centers for cutting. Many of these stones are subsequently returned to the United States in the form of cut diamonds.

U.S. imports

U.S. imports of gem stones consist predominantly of diamonds. Annual imports of rough diamonds in 1961-65 ranged irregularly from 1.4 million to 2.3 million carats and were valued from $103 million to $175 million (table 2). They averaged 1.8 million carats valued at $134 million for the 5-year period. The United Kingdom has been the principal supplier, although that country is not a producer of the rough stones. In the period 1961-65 imports from the United Kingdom accounted for about three-fifths of the quantity and two-thirds of the value of total U.S. imports of rough diamonds.

The great bulk of the U.S. imports of diamonds originate in Africa, but are shipped from the United Kingdom. The United Kingdom is the headquarters of the international diamond combine and is the world's primary diamond-distribution center.

Annual U.S. imports of gem stones other than diamonds increased steadily from about $1.2 million in 1961 to $2.7 million in 1965 and averaged $2 million (table 1). Brazil, Colombia, and Australia have been the principal suppliers. In 1964-65 aggregate imports from these three countries accounted for close to three-fourths of total imports.

Imports from Brazil consisted primarily of agates, quartz, and tourmaline; those from Colombia were chiefly emeralds; and those from Australia were principally opals.

Foreign production and trade

Commercially, diamonds are the most important gem stones. World output of rough gem diamonds in 1965 amounted to about 7.2 million carats. More than four-fifths of world production comes from 11 African countries, the Republic of South Africa, South West Africa, Angola, Congo (Kinshasa), Ghana, Central African Republic, Sierra Leone, Guinea, Liberia, Ivory Coast, and Tanzania. Most of the remainder come from the Soviet Union and Brazil.

By far the larger part of the world's annual supply of rough diamonds is produced under the control of the DeBeers diamond combine. This organization, by virtue of its control over the production and sale of rough diamonds, is able to maintain prices and also exercise an indirect control over the diamond cutting industry. The basic feature of the combine is the channeling of the production of many sources into one sales organization. The combine consists of two parts, one having to do with production and the other with sales.

Production control of rough diamonds is vested in two organizations, the Diamond Producers Association (DPA) and the Diamond Corporation, Ltd. The DPA, with head offices in Kimberly, South Africa, is made up of the principal diamond producers in the Republic of South Africa and South West Africa, including all the DeBeers group, mines associated with DeBeers, and the Government of the Republic of South Africa in its capacity as a diamond producer. The Diamond Corporation, with head offices in London, handles the output of mines located outside the Republic of South Africa, notably of Angola, Congo (Kinshasa), Sierra Leone, and Tanzania. The Diamond Corporation is also a member of the DPA. The function of both organizations is to assign production quotas to the participating companies which in turn are assured of a market for their output.

DeBeers markets rough gem diamonds through the Central Sales Organization (CSO), a group of associated companies, principally The Diamond Purchasing and Trading Co., Ltd., and The Diamond Trading Co., Ltd., with headquarters in London. This organization also has substantial control over the marketing of industrial diamonds.

Gem diamonds are sold by the Diamond Purchasing and Trading Co., Ltd. to the Diamond Trading Co., which in turn sells the diamonds through periodic "sights" or sales to about 200 "qualified" buyers. Qualified buyers are either cutters or dealers from the principal diamond centers. The diamonds are offered in boxes or parcels containing an assortment or series of sizes and qualities at a fixed price for the lot. No negotiations on the price or content of an assortment are permitted.

Although the CSO's primary function is to market crude gem diamonds, it performs many services to insure the producer of a market, at a fixed price, for his alloted output. The CSO also establishes and maintains quality standards for the various types of diamonds; finances the movement of the stones from the producer to the market; conducts market research and maintains a worldwide sales promotion campaign.

Statistics are not available on world production of gem stones other than diamonds. Minerals, from which such gem stones are derived, are widely distributed throughout the world. Among the more important countries producing some of the precious and semiprecious stones are Australia (opal, beryl); Brazil (topaz, ruby, sapphire, beryl, agate); Burma (topaz, ruby, sapphire, beryl, jade); Ceylon (topaz, ruby, sapphire, beryl); Malagasy (sapphire, tourmaline, rose quartz, beryl); and Mexico (topaz, opal, agate).

Table 1.--Precious and semiprecious stones (except diamonds), not advanced in condition and not set: U.S. production and imports for consumption, 1961-66

(Value in thousands of dollars)

Year	Production 1/	Imports for consumption			
		Total	Agates	Rubies, sapphires, and emeralds	Other semi-precious
1961	1,309	1,199	30	675	494
1962	1,296	1,792	27	1,208	557
1963	1,421	1,732	2/	2/	2/
1964	1,474	2,514	2/	2/	2/
1965	2,200	2,727	2/	2/	2/
1966	3/	2,483	2/	2/	2/

1/ Most of the domestic production is accounted for by collectors, hobbyists, etc., rather than by commercial operators.
2/ For the years 1963-66 imports were not separately reported.
3/ Not available.

Source: Production estimated by the U.S. Bureau of Mines; imports compiled from official statistics of the U.S. Department of Commerce.

Note.--Exports are not separately shown in official statistics, but are believed to be small.

Table 2.--Diamonds, rough (except industrial diamonds), not advanced in condition or value from their natural state: U.S. imports for consumption, exports of foreign merchandise, and apparent consumption, 1961-66

Year	Imports for consumption	Exports of foreign merchandise	Apparent consumption
	Quantity (1,000 carats)		
1961	2,275	766	1,509
1962	1,421	1,025	396
1963	1,750	1,220	530
1964	1,548	1/ 1,704	-
1965	1,901	1,280	621
1966	2,032	1,432	600
	Value (1,000 dollars)		
1961	114,670	23,956	90,714
1962	102,446	36,192	66,254
1963	129,870	41,667	88,203
1964	149,729	57,578	92,151
1965	175,457	53,815	121,642
1966	208,039	66,872	141,167

1/ Excess of exports over imports in 1964 is due to the inclusion in the official statistics of unknown amounts of industrial diamonds and cut gem stones.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Note.--There is no U.S. production of uncut diamonds. Although official export statistics show both "domestic" and "foreign" diamonds, it is known that exports consist wholly of previously imported stones.

Commodity	TSUS item
Industrial diamonds:	
Synthetic:	
Miners' diamonds	520.19
Powder or dust	520.20
Other	520.21
Natural:	
Miners' diamonds	520.23
Crushing bort	520.27
Powder or dust	520.28
Other:	
Not advanced in condition or value	520.29
Advanced in condition or value	520.31

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (1968)

U.S. trade position

The United States is the world's largest consumer of industrial diamonds, both natural and synthetic. Although dependent upon imports for its requirements of natural diamonds, the United States is a substantial producer and exporter of synthetic material.

Description and uses

Diamond is the hardest known natural substance; its resistance to wear, chemical inertness below 600 C. and good heat conductivity makes it invaluable as an industrial abrasive. Diamonds are divided into two general classifications--gem stones suitable for use in jewelry, and industrial diamonds. Diamonds suitable for use as gem stones are covered in the summary on item 520.11. Industrial diamonds, because of structure, color, flaws, or impurities, are generally unsuitable as gems. Both industrial and gem quality diamonds are mined from the same deposit. Approximately three-fourths of the world's annual output of diamonds, in terms of weight, consists of industrial diamonds.

On basis of physical characteristics natural industrial diamonds are classified as bort, carbonados, and ballas. Bort are diamonds of poor crystallization, dark in color, easily fractured along lines of cleavage and therefore quite brittle. Carbonados are black diamonds consisting of masses of exceedingly small interlocking crystals. They are amorphous, a property which makes them tougher than any other form of industrial diamonds. Carbonades are found primarily in Brazil and the Central African Republic. Ballas, a rare type of diamond intermediate between bort and carbonado, is spherical in shape with no cleavage planes.

In the trade, industrial diamonds are generally divided into two broad groups--(1) crushing bort, which includes powder or dust; and (2) industrial diamond stones, which include toolstones, drilling stones, and die stones. Within each group are numerous subdivisions based upon quality, size, crystal habit, soundness, texture, color, and use.

An important development in the industrial diamond field was the commercial development of synthetic diamonds in the United States in the late 1950's. Synthetic diamonds are composed of the same material as natural diamonds, the difference being one is produced by man and the other by nature. At the present time synthetic diamonds are commercially available only in the form of powder or dust.

The tariff schedules distinguish between natural and synthetic industrial diamonds. The provision for natural diamonds is broken down to provide for miners' diamonds, crushing bort, powder or dust, and other industrial diamonds; that for synthetic diamonds does not provide separately for crushing bort. Miners' diamonds consist of carbonados, ballas, and certain tumbles processed bort stones used principally in mining drills. Crushing bort consists of crystals and fragments of bort diamonds that are suitable only for grinding into powder or dust. Powder or dust is also obtained as a byproduct from the cutting of gem diamonds. Other diamonds include stones such as are used for normal drilling other than miners' diamonds and for toolstones. Industrial diamonds are also reclaimed from diamond wheels, drill bits, floor sweepings and other sources.

The largest use of industrial diamonds, equal to about 75 percent of total quantity consumed, is in the form of powder or dust principally in the manufacture of bonded grinding wheels and saws. Synthetic and natural diamond powder or dust are interchangeable for these uses. Diamond wheels are used for grinding hard and abrasive materials, such as cemented carbides, glass, and plastics. Diamond saws are used for cutting concrete and stone. Other uses of diamond powder or dust are in wheel dressers, and dental tools, for polishing gem stones, and processing jewel bearings, and carbide and diamond dies. Industrial diamond stones are used principally in oil well drilling bits, and for drilling in the exploration for and the mining of minerals and ores. Lesser quantities are used in the manufacture of diamond tools, wire drawing dies (see separate summary on items 649.48 and 649.49), in engraving tools, phonograph needles, and spray nozzles of oil-burning furnaces.

The carat is the standard unit of weight for industrial diamonds. A carat is equal to 200 milligrams; 142 carats equal 1 troy ounce.

U.S. tariff treatment 1/

The column 1 (or trade-agreement) rates of duty applicable to imports (see general headnote 3 in TSUSA (1968) are as follows:

TSUS item	Commodity	Rate of duty
	Industrial diamonds whether or not advanced in condition, but not set and not suitable for use in the manufacture of jewelry:	
	Synthetic:	
520.19	Miners' diamonds	Free
520.20	Powder or dust	Free
520.21	Other	15% ad val.
	Natural:	
520.23	Miners' diamonds	Free
520.27	Crushing bort	Free
520.28	Powder or dust	Free
	Other:	
520.29	Not advanced in condition or value	Free
520.31	Advanced in condition or value	15% ad val.

The duty-free treatment of natural industrial diamonds, items 520.23 through 520.29, was provided for under the provisions of paragraph 1668 of the original Tariff Act of 1930 and has been bound since January 1, 1948, in a concession granted by the United States in the General Agreement on Tariffs and Trade (GATT). The rate for natural industrial diamonds advanced in condition or value, item 520.31, is the same as that provided for in paragraph 214 of the former tariff schedules for articles wholly or in chief value of earthy or mineral substances, and reflects a GATT concession, effective since January 1, 1948.

The Tariff Schedules of the United States as originally effective on August 31, 1963, provided for all synthetic industrial diamonds in item 520.21, at the rate of 15 percent ad valorem, the same as that provided in paragraph 214 of the Tariff Act. Subsequent Customs Court decisions (C.D. 2537 and C.D. 2538) held that synthetic diamond powder or dust was properly classified in paragraph 1668 of the former schedules. Public Law 89-241 effective October 9, 1965, established duty-free provisions for synthetic miners' diamonds and powder and dust (items 520.19 and 520.20). The 15 percent ad valorem rate applicable to "other" synthetic industrial diamonds was continued by this law. The rates applicable to synthetic industrial diamonds reflect GATT concessions, effective since January 1, 1948.

1/ See the pertinent sections of the TSUSA (1968), reproduced in appendix A, for the rates of duty that became effective on Jan. 1, 1968 as a result of the sixth round of tariff negotiations.

U.S. consumption

The United States is the world's leading consumer of industrial diamonds. During 1961-65, apparent U.S. consumption of industrial diamonds increased annually from 8.5 million carats in 1961 to 13.4 million carats in 1965. Apparent consumption of crushing bort, which normally accounts for more than 70 percent of the total U.S. consumption of industrial diamonds, increased from 5.9 million carats in 1961 to 10.9 million carats in 1965. Actual consumption of crushing bort, including reclaimed material, as reported by the U.S. Department of Commerce, 1/ amounted to 8.2 million carats in 1961, and increased to 9.6 million carats in 1962. In those years over 75 percent of the crushing bort was used in the manufacture of grinding wheels, 10 percent in saws, and about 6 percent as an abrasive in the processing of diamond and carbide dies. The remainder was used in a large number of miscellaneous applications such as dental tools and the cuttting of gem stones.

Apparent consumption of industrial diamond stones fluctuated from less than 1 million carats in 1962 to over 4.1 million carats in 1964. Actual consumption, as reported by the BDSA, amounted to 2 million carats in 1962, and 2.3 million carats in 1965. Over 65 percent of the stones were used in the manufacture of drill bits and reaming shells, and 27 percent in the manufacture of diamond tools (tool stones). The remainder were used in the manufacture of wire drawing dies, phonograph needles, and carbide dies. Imports supply the total U.S. requirements for industrial diamond stones.

The strong upward trend in the consumption of industrial diamonds in recent years reflects an expansion in the use of these materials, especially crushing bort. An important contributory factor has been the availability of adequate supplies of synthetic industrial diamond material. Informateion from the trade is to the effect that for some uses, especially grinding wheels, synthetic material performs better than natural material. Synthetic diamonds are said to be more uniform in structure and to have better friability 2/ than natural crushing bort, thus increasing their abrasive efficiency. Furthermore, producers of synthetic diamonds have steadily improved the quality of their product and have widened the range of available sizes. A significant part of the demand for powder dust is now met by the synthetic product.

Both crushing bort and industrial diamond stones have been stockpiled by the U.S. Government as strategic and critical materials. As of June 30, 1967, the national stockpile of crushing bort amounted to about 38.2 million carats and that of industrial diamond stones to close to 25.1

1/ Industrial Diamond and Small Diamond Dies, U.S. Consumption and Trade, Business and Defense Services Administration (BDSA), May 1966.

2/ Friability refers to the ability to generate progressively new cutting edges as the diamond is used.

million carats. Government inventories of both crushing bort and diamond stones are in excess of the stockpile objective as determined by the Office of Emergency Planning. Such objectives are 24.7 million carats for crushing bort and 16.5 million carats for diamond stones.

On November 2, 1966, the Congress authorized the General Services Administration (Public Law 89-723, 89th Cong., 2nd Sess.) to sell 1.8 million carats of industrial diamond stones. That agency, in turn, on March 14, 1967, offered for sale 90,000 carats of industrial diamond stones but no acceptable bids were received by the end of August 1967. No provision has so far been made for the disposal of crushing bort owned by the Government in excess of the stockpile objective.

U.S. producers and production

Synthetic diamonds are the only kind of industrial diamonds produced in the United States. The manufacture of synthetic diamonds was originated by the General Electric Company in 1957. This company was the only producer until 1967, when two more concerns entered production. The General Electric Company continues to be by far the leading producer.

No figures have been released by the General Electric Company on their output of industrial diamonds. Available information indicates that the annual production has steadily increased from an estimated 3 million carats in 1961 to 6 million carats in 1965 (table 1).

Industrial diamonds are reclaimed by about 12 firms located in the Northeastern and North Central States; in addition many large users of industrial diamonds have their own reclamation operations. Trade sources indicate that reclamation operations resulted in the recovery of about 2 million carats annually in 1961 and 1962. The principal reason for reclaiming industrial diamonds is to reduce the operating costs of the major users.

U.S. exports and imports

In general, U.S. exports and imports of crushing bort and industrial diamond stones have fluctuated over the past decade without showing any marked or identifiable trend. However, extreme care should be used in making assumptions based on international trade statistics because international trade in industrial diamonds is not controlled by supply and demand alone. Government stockpiling and barter policies and the distribution practices of certain major marketing organizations tend to distort trade statistics. Also, diamonds may be imported under one tariff classification, and after being carefully sorted, part may be exported under a different classification. In addition, there is no precise line of demarcation in the statistical classifications, and substantial overlapping exists in reporting.

Exports of industrial diamonds consist mainly of exports of imported natural industrial diamonds, domestically manufactured synthetic diamonds, and reclaimed diamond dust. During the period 1961-65 combined exports of industrial diamonds (including domestically produced synthetic diamonds and previously imported diamonds), in terms of quantity, increased from a low in 1961 of 3.6 million carats to a high in that period of 6.3 million carats in 1964, then declined to 5.5 million carats in 1965. In recent years exports included substantial amounts of domestically produced synthetic diamonds. Belgium, Canada, the United Kingdom, Japan, and West Germany have been the principal export markets.

U.S. imports of industrial diamonds ranged between 11.8 and 14.3 million carats annually during the period 1961-65 (table 2). During 1961-65 imports of natural crushing bort and dust or powder accounted for about one-half of the total annual imports; the remainder consisted almost entirely of industrial diamond stones. In recent years imports of synthetic industrial diamonds have increased, and in 1965 amounted to 749,000 carats.

The Republic of South Africa, the Congo, and Ghana have been the principal suppliers of industrial diamonds (tables 3 and 4). The United States also imports industrial diamonds from such non-diamond producing countries as the United Kingdom, Ireland, and Belgium.

Foreign production

World output of natural industrial diamonds as estimated by the U.S. Bureau of Mines, amounted to 28.3 million carats in 1965. Close to 88 percent of world production comes from Africa, principally from the Congo, which alone accounted for 70 percent of world output, the Union of South Africa, and Ghana. The production and sale of virtually all the African diamonds are under control of the DeBeers diamond combine (see summary on item 520.11). The remainder of the world's supply of natural industrial diamonds comes mostly from the Soviet Republic which in 1965 accounted for about 11 percent of total world production.

Synthetic industrial diamonds are manufactured in Ireland, Sweden, Japan, the Republic of South Africa, and the Soviet Republic. Data on the production of synthetic diamonds are not available.

Table 1.--Industrial diamonds: U.S. production, imports for consumption, exports of domestic and foreign merchandise, national stockpile acquisitions, and apparent consumption, 1961-66

Year	Production 1/	Imports	Exports 2/	National stockpile acquisitions 3/	Apparent consumption
	Crushing bort 4/ (1,000 carats)				
1961	3,000	5,812	854	2,029	5,929
1962	3,000	7,201	1,306	1,000	7,895
1963	4,000	6,577	1,911	23	8,643
1964	5,000	6,959	3,145	-	8,814
1965	6,000	7,471	5/ 2,571	-	10,900
1966	7,000	10,422	5/ 2,763	1,536	13,123
	Industrial diamond stones 6/ (1,000 dollars)				
1961	-	8,398	2,769	3,060	2,569
1962	-	5,081	2,278	1,930	873
1963	-	5,269	2,643	189	2,437
1964	-	7,319	3,204	-	4,115
1965	-	5,521	2,977	-	2,544
1966	-	8,156	2,789	225	5,142

1/ Estimated production of synthetic diamonds.

2/ Exports of crushing bort adjusted for the years 1961-64 to include exports of synthetic powder and dust that were included in the export statistics for diamonds suitable for industrial use.

3/ Based on changes in yearend inventories.

4/ Includes powder and dust, but does not include reclaimed diamonds.

5/ Includes exports of powder and dust of precious and semiprecious stones other than diamonds. Such exports are believed to be small.

6/ Statistics on the exports of industrial diamond stones include exports of crushing bort; exports of crushing bort are small.

Source: Official statistics of the U.S. Department of Commerce, except as noted.

Table 2.--Industrial diamonds: U.S. imports for consumption, by kinds, 1961-66

Year	Diamond dust or powder	Crushing bort	Miners' diamonds	Other industrial diamonds	Synthetic	Total
	Quantity (1,000 carats)					
1961	747	5,065	1/	8,398	1/	14,210
1962	4,556	2,645	1/	5,081	1/	12,282
1963	2,296	4,211	2/ 126	5,143	2/ 70	11,846
1964	2,732	3,819	782	6,538	408	14,279
1965	4,109	2,612	705	4,817	749	12,992
1966	5,453	3,336	748	7,408	1.632	18,577
	Value (1,000 dollars)					
1961	2,196	13,010	1/	53,339	1/	68,545
1962	12,069	6,996	1/	31,976	1/	51,041
1963	6,062	10,874	2/ 657	32,130	2/ 161	49,884
1964	6,841	9,544	4,074	38,608	984	60,051
1965	10,194	6,875	3,700	33,220	1,689	55,678
1966	12,960	8,079	4,142	39,925	4,004	69,110

1/ Not separately classified until Aug. 31, 1963.
2/ Statistics cover 4-month period September-December.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 3.--Industrial diamond crushing bort and powder: 1/ U.S. imports for consumption, by principal countries, 1961-66

Country 2/	1961	1962	1963	1964	1965	1966
	Quantity (1,000 carats)					
United Kingdom	2,083	2,166	1,388	1,591	1,608	645
Ireland	-	3/	155	1,568	4,124	6,541
Belgium	45	46	491	555	446	626
Congo (Leopoldville)	17	471	1,820	1,229	198	1,271
Republic of South Africa	3,487	4,203	2,368	1,244	473	619
Other countries	180	315	355	772	622	720
Total	5,812	7,201	6,577	6,959	7,471	10,422
	Value (1,000 dollars)					
United Kingdom	5,162	5,661	3,681	3,923	4,024	1,389
Ireland	-	1	435	4,015	10,568	16,151
Belgium	151	127	1,190	1,326	1,016	1,358
Congo (Leopoldville)	53	1,263	4,615	2,990	470	3,029
Republic of South Africa	9,331	11,131	6,278	3,306	1,145	1,442
Other countries	509	882	898	1,809	1,535	1,673
Total	15,206	19,065	17,097	17,369	18,758	25,042

1/ Includes synthetic diamond.
2/ Statistics reflect country of shipment when country of origin cannot be determined.
3/ Less than 1,000 carats.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 4.--Industrial diamond stones: U.S. imports for consumption, by principal countries, 1961-66

Country 1/	1961	1962	1963	1964	1965	1966
	Quantity (1,000 carats)					
United Kingdom	3,830	626	639	854	954	984
Ireland	100	310	575	752	613	2,496
Netherlands	437	56	113	135	249	498
Belgium	2,132	320	401	611	602	768
Ghana	56	830	776	1,206	549	317
Republic of South Africa	556	1,192	1,455	2,558	1,593	1,742
Other countries	1,287	1,747	1,310	1,204	961	1,351
Total	8,398	5,081	5,269	7,320	5,521	8,156
	Value (1,000 dollars)					
United Kingdom	20,793	4,904	6,265	7,580	9,946	9,206
Ireland	432	1,584	2,947	3,816	3,220	9,087
Netherlands	3,786	471	1,384	976	1,515	2,027
Belgium	13,708	2,017	2,465	3,327	3,088	4,404
Ghana	430	4,229	3,943	5,850	2,901	1,715
Republic of South Africa	2,197	7,616	7,668	10,103	8,480	9,267
Other countries	11,993	11,155	8,115	11,030	7,770	8,360
	53,339	31,976	32,787	42,682	36,920	44,066

1/ Statistics reflect country of shipment when country of origin cannot be determined.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Commodity	TSUS item
Precious and semiprecious stones, cut but not set, and suitable for use in the manufacture of jewelry:	
Diamonds	520.32, -.33, -.34
Rubies and sapphires	520.35
Marcasites	520.37
Emeralds	520.38
Other	520.39

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (1968).

U.S. trade position

The United States depends upon imports for most of its requirements for cut precious and semiprecious stones. Domestic production of such stones (virtually all from imported rough stones) consists predominantly of diamonds. Exports of cut diamonds, which are considerably less than imports, consist in part of cut stones previously imported. Exports of other gem stones are believed to be small.

Description and uses

This summary covers precious and semiprecious stones, herein referred to as gem stones, cut but not set, suitable for use in jewelry, as distinct from uncut or rough precious and semiprecious stones (see summary on item 520.11).

Gem stones are cut and polished to bring out the stone's beauty of color and to develop scintillating reflections from the interior of the stone through light refraction and reflection. For tariff purposes precious stones are natural diamonds, emeralds, rubies, and sapphires, whereas other natural gem stones are designated as semiprecious stones.

Commercially, the most important gem stone covered herein is the diamond (520.32-.34), a crystalline form of carbon. The cut of a diamond is determined by the shape of the rough stone. The four main diamond cuts are the brilliant, the emerald, the marquise, and the pear-shaped cut. Of these, the most frequently used is the brilliant cut, which brings out to a marked advantage the fire and brilliance of the gem.

Rubies and sapphires (item 520.35) are transparent colored varieties of the mineral corundum (aluminum oxide). Rubies are red in color and

sapphires are blue, but may also have other colors. A variety of rubies and sapphires, not transparent, are known as star stones. If correctly cut and polished, with a rounded domeshape top (known as cabochon), such stones reveal a clearly marked 6-rayed star on the curved surface.

Marcasite (item 520.37) is a white iron pyrite (FeS_2)--not the mineral marcasite. It is black with a yellowish tinge, but when polished, it has a bright metallic luster. Marcasite is brittle and may be easily cracked.

Emeralds (item 520.38) are the most highly prized variety of the mineral beryl. There are many grades of emeralds and they range in color from very pale to fairly deep green, and from yellow-green to blue-green. They have little "fire" for the color dispersion is slight and they are more fragile than most gemstones. Flawless or near-flawless emeralds of good color, however, are rare and bring higher prices than most diamonds of comparable size.

Among the popular semiprecious stones (item 520.39) are alexandrite, aquamarine, jade, opal, topaz, and zircon.

Gemstones are used almost solely in the manufacture of jewelry and related articles. At times gemstones, especially precious stones, are purchased by people because they represent wealth that can easily be hidden and transported and readily be sold.

U.S. tariff treatment 1/

The column 1 (or trade-agreement) rates of duty applicable to imports (see general headnote 3 in TSUSA (1968)) are as follows:

TSUS item	Commodity	Rate of duty
	Precious and semiprecious stones, cut but not set, and suitable for use in the manufacture of jewelry:	
	Diamonds:	
520.32	Weighing not over 0.5 carat	8% ad val.
520.33	Weighing over 0.5 carat	10% ad val.
520.34	If product of Cuba	8% ad val.
520.35	Rubies and sapphires	8% ad val.
520.37	Marcasites	10% ad val.
520.38	Emeralds	3% ad val.
520.39	Other	5% ad val.

1/ See the pertinent sections of the TSUSA (1968), reproduced in appendix A, for the rates of duty that became effective on Jan. 1, 1968, as a result of the sixth round of tariff negotiations.

The rates of duty for the above items are the same as those under paragraph 1528 of the former schedules and reflect concessions granted by the United States in the General Agreement on Tariffs and Trade. The rates for items 520.33, 520.34, and 520.39 have been effective since January 1, 1948; that for item 520.37 has been in effect since April 21, 1948; while those for items 520.32, 520.35, and 520.38 have been effective since July 1, 1963. The rate shown for item 520.34, the preferential rate for Cuba, was suspended on May 24, 1962. Imports from Cuba have been prohibited since February 7, 1962.

U.S. consumption, producers, and production

The United States is the world's largest single market for cut gemstones, a large part of which is imported. Similarly requirements for rough stones by domestic lapidaries are virtually all met by imports. According to the Bureau of the Census there were 318 gemstone cutting establishments in the United States in 1963. By far, the greater part of these concerns specialize in the cutting of diamonds. The industry is concentrated in or near New York City.

The cutting of gemstones is a craft that requires skill, especially where stones of great value are concerned. Generally, cutting costs represent a substantial proportion of the value of finished gemstones. As a rule, mainly because of the relatively high labor cost, only the larger, better quality stones are cut in this country. Official statistics on the output of cut gemstones by domestic gem cutters are not available.

U.S. exports and imports

Official U.S. statistics show exports of only cut diamonds and do not separately report those of other gemstones. Annual exports of cut diamonds in 1961-65 fluctuated in quantity and ranged from 38,000 carats to 151,000 carats, but steadily increased in value from $12.5 million to $43.2 million (table 2). They averaged 95,000 carats, valued at $29.7 million. Hong Kong and Belgium have been the principal export markets (table 3).

Annual imports of cut gemstones during 1961-65 increased from about $84 million to $146 million (table 1) and averaged $109 million. Imports consisted almost entirely of precious stones, predominantly cut diamonds. Imports of diamonds increased from 839,000 carats in 1961, valued at $78.6 million to close to 1.3 million carats in 1965, valued at $132 million (table 2). Of total imports during 1963-65 of cut diamonds about 90 percent by quantity and 80 percent by value consisted of stones weighing 1/2 carat or less. Belgium and Israel have been the principal sources of supply (table 4).

Imports of other precious stones increased from about $6 million in 1961 to $14 million in 1965 (table 5). Such imports were about evenly divided between rubies and sapphires, and emeralds. India, Thailand, and Ceylon have been the principal suppliers of rubies and sapphires (table 6) and India and Colombia have been the main sources of emeralds (table 7). Generally emeralds from Colombia are of high quality whereas those from India are of medium or low grade.

Annual imports of cut semiprecious stones during 1961-65 increased from about $2 million to $4 million. Based on a sample analysis of import documents for 1964 and 1965 imports consisted of about 40 different species and varieties of semiprecious stones. Among these were opals, peridots, garnets, jade, carnelians, citrines, and amethysts. Hong Kong has been the chief foreign supplier followed by Germany, and Brazil (table 8).

Facilities for cutting gemstones exist in a number of countries. The most important diamond-cutting centers are Belgium (Antwerp), and Israel. Other major diamond-cutting industries are found in India, the Netherlands, West Germany, and the Republic of South Africa. Hong Kong and West Germany (Idar-Oberstein) are important centers for cutting semiprecious stones.

Table 1.--Precious and semiprecious stones, cut but not set: U.S. imports and exports, 1961-66

(In thousands of dollars)

Year	Imports			Exports 1/		
	Total	Precious stones	Semiprecious stones	Total	Domestic	Foreign
1961----	84,631	82,901	1,730	12,502	11,211	1,291
1962----	97,084	94,884	2,200	15,048	13,882	1,166
1963----	101,145	98,773	2,372	35,135	33,015	2,120
1964----	118,614	115,615	2,999	42,692	38,839	3,853
1965----	145,626	141,994	3,632	43,199	40,069	3,130
1966----	183,902	172,905	10,997	60,642	54,524	6,118

1/ Diamonds only. Data on other precious and semiprecious stones are not available.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Note.--U.S. production of cut gemstones, which is not reported in official statistics, is believed to be less than imports.

Table 2.--Diamonds (except industrial diamonds), cut but not set: U.S. imports for consumption and exports of domestic and foreign merchandise, 1961-66

Year	Imports			Exports of domestic and foreign merchandise		
	Total	Not over 1/2 carat	Over 1/2 carat	Total	Domestic	Foreign
	Quantity (1,000 carats)					
1961	839	1/	1/	46	33	13
1962	982	1/	1/	38	30	8
1963	1,018	912	106	116	69	47
1964	1,097	995	102	151	113	38
1965	1,259	1,145	114	126	99	27
1966	1,452	1,320	132	198	115	83
	Value (1,000 dollars)					
1961	78,605	1/	1/	12,502	11,211	1,291
1962	89,188	1/	1/	15,048	13,882	1,166
1963	93,977	74,614	19,363	35,135	33,015	2,120
1964	108,302	87,355	20,947	42,692	38,839	3,853
1965	131,828	105,953	25,875	43,199	40,069	3,130
1966	165,737	136,313	29,424	60,642	54,524	6,118

1/ Not available.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Note.--Statistics on domestic production of cut diamonds are not available.

Table 3.--Diamonds, cut but not set: Exports of foreign and domestic merchandise, by principal sources, 1961-66

Country	1961	1962	1963	1964	1965	1966
	Quantity (carats)					
Japan	354	501	3,011	29,749	15,678	15,273
Switzerland	5,863	5,730	12,269	8,985	12,999	6,905
Hong Kong	4,092	7,580	17,751	31,590	31,258	54,641
Belgium	15,301	10,037	24,753	27,523	22,307	24,392
Netherlands	1,098	2,571	12,386	18,256	17,544	26,045
All other	19,302	11,510	45,485	37,286	25,948	70,627
Total	46,070	37,929	115,655	151,389	125,734	197,883
	Value (1,000 dollars)					
Japan	85	1,479	770	1,882	4,256	8,812
Switzerland	2,953	3,335	5,862	3,543	4,455	4,524
Hong Kong	1,740	3,789	8,206	15,633	19,053	27,127
Belgium	3,949	3,759	9,750	10,231	4,851	5,706
Netherlands	487	1,161	6,617	6,494	4,926	6,186
All other	3,288	1,525	3,930	4,909	5,458	8,287
Total	12,502	15,048	35,135	42,692	43,199	60,642

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 4.--Diamonds, cut but not set: U.S. imports for consumption, by principal sources, 1961-66

Country	1961	1962	1963	1964	1965	1966
	Quantity (1,000 carats)					
Belgium	428	479	522	583	680	787
Israel	278	343	374	426	473	525
Republic of South Africa	32	26	27	24	27	28
West Germany	52	75	46	18	19	17
Netherlands	29	24	19	14	21	21
All other	20	35	29	31	40	74
Total	839	982	1,017	1,097	1,260	1,452
	Value (1,000 dollars)					
Belgium	41,957	45,722	50,555	60,155	73,923	94,353
Israel	21,971	27,880	29,719	36,800	42,134	51,446
Republic of South Africa	5,725	4,721	4,736	4,918	6,166	7,001
West Germany	3,480	5,394	3,502	1,335	1,369	1,440
Netherlands	3,234	2,464	2,424	1,896	2,834	3,012
All other			3,042	3,700	5,400	8,485
Total	78,604	89,188	93,978	108,804	131,826	165,737

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 5.--Precious stones, except diamonds, and semiprecious stones, cut but not set: U.S. imports for consumption, 1961-66

(In thousands of dollars)

Year	Total	Precious stones		Semiprecious stones	
		Rubies and sapphires	Emeralds	Marcasites	Other
1961	6,026	2,206	2,090	36	1,694
1962	7,896	2,898	2,798	1/	2,200
1963	7,168	2,715	2,081	1	2,371
1964	10,312	4,095	3,218	2	2,997
1965	13,797	4,769	5,397	3	3,629
1966	18,165	7,163	6,025	5	4,972

1/ Less than $500.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Note.--Statistics on domestic production of cut precious and semiprecious stones are not available.

Table 6.--Rubies and sapphires, cut but not set: U.S. imports for consumption, by principal sources, 1961-66

(In thousands of dollars)

Country	1961	1962	1963	1964	1965	1966
India	912	1,338	948	1,524	1,599	2,327
Thailand	156	368	445	627	947	1,622
Ceylon	358	497	491	727	617	1,182
All other	780	694	831	1,207	1,607	2,032
Total	2,206	2,897	2,715	4,095	4,770	7,163

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 7.--Emeralds, cut but not set: U.S. imports for consumption, by principal sources, 1961-66

Country	1961	1962	1963	1964	1965	1966
	Quantity (1,000 carats)					
India	202	183	175	163	138	173
Colombia	3	4	2	3	15	7
All other	22	10	14	15	37	40
Total						
	Value (1,000 dollars)					
India	1,086	2,006	1,589	1,872	2,245	2,608
Colombia	249	446	182	491	1,104	667
All other	1,764	346	310	855	205	2,750
Total	3,099	2,798	2,081	3,218	5,397	6,025

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 8.—Semiprecious stones, cut but not set: U.S. imports for consumption, by principal sources, 1961-66

(In thousands of dollars)

Country	1961	1962	1963	1964	1965	1966
Hong Kong	414	658	934	1,316	1,376	992
Japan	307	342	256	229	353	967
West Germany	257	378	395	353	485	920
Brazil	162	217	231	386	315	510
All other	553	605	555	717	1,101	1,583
Total	1,693	2,200	2,371	3,001	3,630	4,972

Source: Compiled from official statistics of the U.S. Department of Commerce.

Commodity	TSUS item
Other precious and semiprecious stones, and articles thereof:	
Of precious stones	520.51
Of rock crystal	520.54
Other	520.61

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (1968)

U.S. trade position

U.S. production of the articles covered by this summary is believed to be small and imports probably supply most, if not all of the domestic consumption.

Comment

This summary covers precious and semiprecious stones (except industrial diamonds) advanced in condition or value from their natural state but not suitable for use in the manufacture of jewelry (see summary covering items 520.32-520.39 for stones suitable for use in the manufacture of jewelry). Also covered are articles of precious and semiprecious stones except such articles as jewelry, jewel bearings, and phonograph needles (see headnote 1 to part 5H of Schedule 5 of the TSUSA).

Articles included in this summary may be made wholly or in chief value of either precious stones, i.e., diamonds, rubies, sapphires, or emeralds (520.51); or of rock crystal (520.54); or of other semiprecious stones, such as jade, coral, agate, aventurine, and chalcedony (520.61). Among the articles commonly imported are art and novelty wares, such as vases, bowls, ashtrays, figurines (other than figurines provided for in TSUS items 513.51 and 765.15), bottles, jars, boxes, and mosaics. They are used mostly for decorative purposes.

STONES AND ARTICLES OF PRECIOUS AND SEMIPRECIOUS STONES NOT ELSEWHERE ENUMERATED

The column 1 (or trade-agreement) rates of duty 1/ applicable to imports (see general headnote 3 in TSUSA (1968)) are as follows:

TSUS item	Commodity	Rate of duty
520.51	Articles of precious stones	15% ad val.
520.54	Articles of rock crystal	21% ad val.
520.61	Other	42.5% ad val.

These rates reflect concessions granted by the United States in the General Agreement on Tariffs and Trade. The rate on articles of precious stones is derived from paragraph 214 of the former schedules and has been in effect since January 1, 1948; the rate on articles of rock crystal which is the same as that under paragraph 233 and that on articles of other semiprecious stones which was also derived from paragraph 233 have been in effect since June 30, 1958.

United States consumption of the articles covered by this summary is virtually all supplied by imports. As far as is known there is no commercial production of such articles in the United States.

Imports increased almost steadily from about $90,000 in 1961 to $218,000 in 1965 (table 1), and averaged $162,000 in the 5-year period. Imports consisted principally of semiprecious stones and articles thereof; most of such imports were manufactures of semiprecious stones other than rock crystals (520.61). Based on a small number of sample invoices for recent years, among the items imported under this classification were hand-carved figurines and statuettes, hand-carved ornaments, mortars and pestles, ashtrays, vases, salt dishes, plaques, pill boxes, and snuff bottles. Most of the articles were made of either jade or agate.

Rock crystal articles imported were chiefly figurines and hand-carved ornaments. West Germany and Japan were the major sources of rock crystal articles (table 2) and Japan, Hong Kong, and West Germany were the principal suppliers of articles made of semiprecious stones other than rock crystal (table 3).

1/ See the pertinent sections of TSUSA (1968), reproduced in appendix A, for the rates of duty that became effective on January 1, 1968, as a result of the sixth round of tariff negotiations.

Table 1.--Precious and semiprecious stones (except industrial diamonds) advanced in condition but not suitable for use in the manufacture of jewelry, and articles thereof: U.S. imports for consumption, 1961-66

(Value in dollars)

Year	Total	Precious stones and articles thereof	Articles of rock crystal	Other semiprecious stones and articles thereof
1961	91,995	1/	20,100	71,895
1962	153,776	1/	54,230	99,546
1963	135,217	1/	31,647	103,570
1964	212,475	6,913	49,319	156,243
1965	217,729	4,068	45,569	168,092
1966	320,469	47,973	54,372	218,124

1/ Not separately shown in official statistics before 1964.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Note.--As far as is known, there is little commercial production in the United States, if any, of the articles covered herein and exports are believed to be nil.

STONES AND ARTICLES OF PRECIOUS AND SEMIPRECIOUS STONES NOT ELSEWHERE ENUMERATED

Table 2.--Articles of rock crystal: U.S. imports for consumption, by principal sources, 1961-66

Value in dollars

Country	1961	1962	1963	1964	1965	1966
West Germany	3,936	22,809	19,205	20,196	20,011	23,477
Japan	12,427	9,750	9,037	19,004	20,307	14,388
Canada	-	670	2,712	7,677	-	-
United Kingdon	103	15,294	373	-	-	2,246
Italy	3,020	5,090	320	-	-	-
All other	614	617	119	2,442	1/ 5,251	2/ 14,261
Total	20,100	54,230	31,766	49,319	45,569	54,372

1/ Includes imports from France valued at $5,051.
2/ Includes imports from France valued at $8,808, and from Portugal valued at $5,453.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 3.--Articles of semiprecious stones other than rock crystal: U.S. imports for consumption, by principal sources, 1961-66

Value in dollars

Country	1961	1962	1963	1964	1965	1966
Japan	48,497	39,311	60,231	104,297	83,964	128,497
Hong Kong	10,101	36,972	8,986	18,164	12,419	5,958
West Germany	10,489	12,077	14,551	12,502	27,289	18,773
Italy	935	3,769	4,526	7,101	10,868	13,816
Taiwan	274	200	832	2,363	12,194	16,429
All other	1,808	7,235	1/ 15,440	11,354	2/ 21,358	3/ 34,651
Total	72,104	99,564	104,566	155,781	168,092	218,124

1/ Includes imports from Brazil valued at $4,926, and from India valued at $4,066.

2/ Includes imports from France valued at $5,059 and from India valued at $4,974.

3/ Includes imports from the United Kingdom valued at $16,313.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Commodity	TSUS item
Synthetic materials of gemstone quality:	
Cut but not set and suitable for use in jewelry----	520.71
Other----------	520.75

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (1968).

U.S. trade position

The United States is a producer of synthetic materials of gemstone quality, and stones and articles fashioned from such materials. Domestic production of most kinds of such synthetic materials and articles thereof is greater than imports. Exports are believed to be small.

Description and uses

Synthetic materials of gemstone quality are man-made materials having the same chemical composition and physical and optical properties as their natural mineral counterparts. These materials, and gemstones cut from them, generally appear to the unaided eye to be identical with the corresponding natural minerals or cut gem stones; as a matter of fact, many of the synthetics are more perfect than the corresponding natural minerals. However, good quality natural gem quality minerals usually command a higher price because they are "genuine" and because the supply is often limited. Stones cut but not set and suitable for use in jewelry are provided for in item 520.71, whereas item 520.75 provides for the synthetic material in an unworked state and articles not specially provided for elsewhere in the tariff schedules which are fabricated from such material. In accordance with headnote 1 to part 1H of schedule 5 of TSUS, the articles described under item 520.75 do not include certain drills and other tools; styluses, needles, and points; optical elements; jewel bearings; abrasives; and jewelry and related articles.

The natural minerals corundum (ruby and sapphire varieties), emerald, spinel, and rutile have been synthesized in gemstone quality in commercial quantities. 1/ In addition, there is at least one synthetic material of gemstone quality (strontium titanate, marketed under the trade name "Fabulite") for which a corresponding natural

1/ Although diamond has been synthesized, up to the present time the synthetic diamonds produced commercially have not been of gem quality (see summary on industrial diamonds in this volume).

mineral of gem quality is not known to exist. Corundum is the most important material of gemstone quality synthesized for use in industrial applications.

Synthetic materials of gemstone quality are grown in the form of long, cylindrical rods or in pear- or carrot-shaped masses called "boules". The rods and boules are either cut into stones for use in medium-priced jewelry or fabricated into articles having industrial applications. In industrial applications, these synthetic materials often are preferred to the natural minerals on the basis of size, hardness, purity, availability, or cost.

The industrial applications for synthetic gemstone material covered by this summary include component parts of thread guides, gauge tips, compasses, phonograph needles, and certain missile and space products. An important use for synthetic corundum is as jewel bearings in time-keeping, -measuring, and -indicating devices (see summary on item 720.60).

Since 1958, major research and development has taken place in the use of synthetic gemstone material--particularly the ruby variety of corundum--for use in lasers and masers. These are devices for lightwave (lasers) and microwave (masers) amplification by stimulated emission. The use of lasers and masers has become increasingly important in the fields of medicine, communication, and scientific research.

U.S. tariff treatment 1/

The column 1 (or trade-agreement) rates applicable to imports (see general headnote 3 in TSUSA (1968)) are as follows:

TSUS item	Commodity	Rate of duty
	Synthetic material of gemstone quality, and articles not specially provided for, of such materials:	
520.71	Synthetic materials cut but not set-------	8% ad val.
520.75	Other----------	30% ad val.

The rate of duty for item 520.71 reflects a concession under paragraph 1528 of the former schedules as granted by the United States in the General Agreement on Tariffs and Trade, effective July 1, 1963. The rate for item 520.75 is derived from the rate under paragraph 214 of the former tariff schedules; it is not a concession rate.

1/ See the pertinent sections of the TSUSA (1968), reproduced in appendix A, for the rates of duty that became effective on January 1, 1968 as a result of the sixth round of tariff negotiations.

U.S. consumption, producers, and production

Before World War II domestic consumption of synthetic gemstone materials and articles was all supplied by imports. No data are available on the U.S. consumption of synthetic materials of gemstone quality, stones cut from such materials for use in jewelry, or articles of such materials.

Domestic production of synthetic gemstone materials began during World War II. At the end of 1966 there were only three commercially important producers of such materials. Two of the producers are divisions of large corporations, while the other is a small independent company. One of these firms produces synthetic corundum in Indiana, one makes synthetic emeralds in California, and the other manufactures synthetic rutile and strontium titanate in New Jersey. There appears to be no domestic production of synthetic spinel in commercial quantities.

Up to the present time, most of the synthetic material of gemstone quality produced domestically has been corundum. The bulk of the domestic output of synthetic corundum intended for use in gemstones has been star rubies and star sapphires.

About 20 small lapidary and fabricating firms cut these materials for jewelry and industrial applications. Most of these firms cut their stones and other articles from rods and boules produced by the three domestic manufacturers of synthetic materials of gemstone quality.

Official data are lacking on domestic production of the materials, gem stones, and articles covered in this summary, and sufficient company data are not available to permit estimating the value of production.

U.S. exports and imports

Exports of synthetic gemstone materials and articles are not separately shown in official statistics; such exports are believed to be small compared to domestic production and imports. Available information indicates that exports consist largely of laser rods, fabricated sapphire optical components, and other corundum specialties.

Virtually all of the imports intended for use in jewelry are entered already cut, but not set, because much higher rates of duty apply to both set gem stones and to the raw materials (rods and boules) from which synthetic stones are cut for setting in jewelry. On the other hand, almost all of the imports at the higher rate of duty (item 520.75) are intended for industrial use.

As reported in official statistics, the value of annual imports of cut synthetic gem stones nearly tripled from 1961 to 1962, increasing from $346,000 to $1,006,000 (see table). The annual value of imports of rods and boules, and articles, n.s.p.f., thereof, varied during that period, between $146,000 and $277,000 (see table).

A substantial amount of imports of synthetic gem stones, cut but not set, enters the United States by parcel post with an invoice value of less than $250; such shipments usually do not become part of official statistics. Based on a 1964 survey of a sample of informal import entries, it is believed that actual imports of cut synthetic gem stones are at a level at least double the official figures. On the other hand, the value of under-$250 entries of synthetic materials of gemstone quality, and of articles, n.s.p.f., of such materials was equal to about half the value of reported entries.

Most of the imports of cut synthetic gem stones into this country for use in jewelry are entered from West Germany and Switzerland (see table). Most imports of synthetic material of gemstone quality, cut for use in jewelry, is corundum (mainly star rubies, star sapphires, and unstarred rubies and sapphires); the remainder is largely synthetic spinel and rutile. Imports of cut synthetic emeralds are small, while cut strontium titanate gem stones have not been imported.

Switzerland, France, and West Germany have been the principal suppliers of imports of synthetic materials of gemstone quality, usually of synthetic corundum and articles made from such material.

Table.--Synthetic materials of gemstone quality, and articles, n.s.p.f., of such materials: U.S. imports for consumption, total and by selected countries, 1961-66

(Value in thousands of dollars)

Year	Total	West Germany	Switzerland	France	Other
	Cut but not set				
1961	346	276	22	7	41
1962	457	338	78	3	38
1963	398	344	21	1	32
1964	623	546	56	9	12
1965	1,006	751	203	26	26
1966	1,178	918	160	48	52
	Not cut, and articles, n.s.p.f.				
1961	146	21	68	9	48
1962	277	57	109	14	97
1963	151	33	75	5	38
1964	160	7	51	89	13
1965	201	30	81	81	9
1966	132	19	70	38	5

Source: Compiled from official statistics of the U.S. Department of Commerce.

Note.--Quantity data are not reported for imports of synthetic materials of gemstone quality, not cut, and articles, n.s.p.f. "Number of pieces" quantity data are reported for imports of synthetic materials of gemstone quality, cut but not set; such data, however, obscure great differences in unit value, and are of little value.

Note.--Data on the domestic production and exports--and hence on domestic consumption--are not available.

Commodity	TSUS item
Asphaltum, bitumen, and limestone-rock asphalt----------	521.11

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (1968).

U.S. trade position

Domestic requirements of asphalt in 1961-65 were supplied almost entirely from domestic sources. Imports supplied less than 5 percent of consumption; exports were equal to less than 1 percent of domestic production.

Description and uses

This summary covers all natural asphalts and petroleum asphalt. Asphalt is a semisolid, organic, sticky material, black or brown in color, varying in consistency from heavy liquid to solid. It is obtained either from natural deposits or from the distillation of petroleum. Natural asphalts differ from petroleum asphalts in that the former often contain minerals while the latter do not.

Natural asphalt occurs as lakes, as mixtures or emulsions with sand, clay, or water, and as asphaltites and asphaltic impregnations of sandstone and limestone commonly known as rock asphalt or bituminous rock. In the United States, production of natural asphalt consists of bituminous rock and of gilsonite, a high-grade asphaltite mined in northeastern Utah. Petroleum asphalt is derived from crude oil and is marketed as cements and fluxes, emulsions, cutbacks, and road oil. Commercially, petroleum asphalt is by far the most important asphalt covered here.

Asphalt 1/ is used chiefly in road building, waterproofing, roofing, floor tiling, and the manufacture of bituminous paper and molding compounds. Much of the gilsonite produced in the United States is refined to recover high-octane gasoline and petroleum coke for the manufacture of electrolytic electrodes.

U.S. tariff treatment

Imports of the products covered by this summary are duty free. The duty-free treatment was provided for under paragraph 1710 of the

1/ For convenience, the term asphalt as used hereafter in the text includes both natural and petroleum asphalts.

Tariff Act of 1930 and was bound in part, effective Jan. 1, 1948, in a concession granted by the United States in the General Agreement on Tariffs and Trade as indicated in appendix B to Presidential Proclamation 3712 of April 5, 1966.

U.S. consumption

Annual domestic consumption of the products covered by this summary has been increasing slowly for a number of years primarily as a result of public roads programs. Between 1961 and 1965, annual U.S. consumption of asphalt increased nearly 20 percent from about 22.2 million short tons to 26.3 million short tons (table 1), and averaged 24.3 million tons. During this period, 76 percent of the asphalt consumed was used in road building; 16 percent, in the manufacture of roofing products; and the remainder, in miscellaneous applications.

U.S. producers and production

In 1963, the latest year for which detailed statistics are available, 39 petroleum refineries produced petroleum asphalt. Most of the output came from plants located in California, Texas, Illinois, New Jersey, Ohio, Pennsylvania, New York, and Florida. Gilsonite was produced by four firms in Utah, and four concerns produced bituminous rock (bituminous limestone and sandstone) in Alabama, Texas, and Missouri.

Annual domestic production of asphalt during 1961-65 rose steadily from about 21.1 million short tons to 25.6 million tons (table 1) and averaged 23.3 million tons in the 5-year period. Production consisted predominantly of petroleum asphalt, which in recent years accounted for 88 percent of the total domestic output of asphalt. Road oil accounted for an additional 5 percent, and the remainder was about equally divided between gilsonite and other natural asphalts.

U.S. exports and imports

Annual exports of asphalt during 1961-65 averaged 143,000 short tons and were equal to less than 1 percent of domestic production. Exports consisted mostly of petroleum asphalt and went to a large number of countries throughout the world. The principal markets for natural asphalts were countries of Western Europe, chiefly the United Kingdom, Belgium, Italy, and West Germany. Exports of petroleum asphalt went mostly to countries of the Western Hemisphere, principally Canada, Mexico, the Bahamas, Chile, and Venezuela.

U.S. imports of asphalt originate chiefly in the Netherlands Antilles and Venezuela (table 2). Annual imports during 1961-65

fluctuated within narrow limits and averaged about 1.2 million short tons, valued at $15 million. They consisted predominantly of petroleum asphalt and supplied an average of less than 5 percent of total domestic consumption.

Table 1.--Asphaltum, bitumen, and limestone-rock asphalt: U.S. production, imports for consumption, exports of domestic merchandise, yearend stocks, and apparent consumption, 1961-66

(Quantity in thousands of short tons)

Year	Production	Imports	Exports	Yearend Stocks	Apparent consumption	Ratio (percent) of imports to consumption
1961	21,130	1,223	126	2,501	22,223	5.5
1962	22,830	1,221	176	2,750	23,626	5.2
1963	1/ 23,235	1,151	160	2,747	24,229	4.8
1964	1/ 23,910	1,114	150	2,693	24,928	4.5
1965	1/ 25,579	1,176	104	3,047	26,297	4.5
1966	2/	1,151	41	2/	2/	2/

1/ Partly estimated.
2/ Not available.

Source: Production and stocks, from official statistics of the U.S. Bureau of Mines; imports and exports, from official statistics of the U.S. Department of Commerce.

Table 2.--Asphaltum, bitumen, and limestone-rock asphalt: U.S. imports for consumption, by principal sources, 1961-66

Country	1961	1962	1963	1964	1965	1966
	Quantity (1,000 short tons)					
Netherlands Antilles	742	612	556	645	658	663
Venezuela	480	584	569	432	472	442
Canada	1/	2	14	27	33	37
Trinidad	1	6	5	4	7	9
Netherlands	-	17	8	6	6	-
All other	1/	1/	1	1/	-	-
Total	1,223	1,221	1,151	1,114	1,176	1,151
	Value (1,000 dollars)					
Netherlands Antilles	8,934	7,478	6,839	7,882	8,148	7,671
Venezuela	6,686	8,010	7,845	5,581	5,866	5,380
Canada	1	48	264	465	568	674
Trinidad	21	117	106	95	151	145
Netherlands	-	227	99	73	77	-
All other	4	10	8	5	-	-
Total	15,646	15,890	15,161	14,101	14,810	13,870

1/ Less than 500 short tons.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Commodity	TSUS item
Bauxite, calcined----------	521.17

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (1968).

U.S. trade position

The United States depends upon imports for most of its requirements of calcined bauxite. In recent years imports have supplied over 70 percent of domestic consumption. Exports are believed to be nil.

Comment

Calcined bauxite is produced by firing bauxite ore (see summary on item 601.06) to a temperature of about 2,000° F. to eliminate all water, and crushing and sizing the fired material. It is marketed in abrasive and refractory grades. The difference between the two grades is primarily in the iron oxide content, which does not exceed 2 percent in the refractory grade and ranges between 3 and 8 percent in the abrasive grade.

Calcined bauxite is used chiefly in the manufacture of high-alumina refractories in the form of bricks and cementing compounds. Lesser quantities are used mostly in abrasives, catalysts, and certain chemical compounds.

In its chief use calcined bauxite has no competition. It does, however, compete with silicon carbide in many abrasive applications, with calcined kaolin and certain synthetic materials in the catalyst field, and with calcined kaolin as an alumina source material in certain chemical compounds.

The column 1 (or trade-agreement) rate of duty 1/ applicable to imports (see general headnote 3 in TSUSA-1968)) is as follows:

TSUS item	Commodity	Rate of duty
521.17	Bauxite, calcined----------	55¢ per long ton

1/ See the pertinent sections of TSUSA (1968), reproduced in appendix A, for the rate of duty resulting from the sixth round of tariff negotiations that became effective on Jan. 1, 1968.

The provision for all calcined bauxite became effective under the Tariff Schedules of the United States on August 31, 1963. The rate is the same as that under paragraph 207 of the former schedules applying to calcined bauxite imported to be used in the manufacture of fire brick or other refractories. Other calcined bauxite was dutiable under paragraph 214 of the previous schedules at the concession rate of 15 percent ad valorem. The rate of 55¢ per long ton under paragraph 207 became effective on July 1, 1963, and reflected a concession granted by the United States in the General Agreement on Tariffs and Trade. The rate for item 521.17 is now a trade-agreement rate. However, the duty on calcined bauxite imported to be used in the manufacture of fire brick or other refractories was first temporarily suspended effective July 10, 1954 (68 Stat. 483), and the duty on all calcined bauxite has been suspended since July 16, 1956 (see item 909.30 of the Appendix to the Tariff Schedules of the United States Annotated.

Annual domestic consumption of calcined bauxite steadily increased from 114,000 long tons in 1961 to a high of 289,000 long tons in 1965 and averaged 212,000 long tons during the 5-year period (table 1). About two-thirds of the calcined bauxite consumed was used in the manufacture of refractories and most of the remainder, in the manufacture of alumina abrasives.

Refractory-grade calcined bauxite has been stockpiled by U.S. Government as a strategic and critical material. At the beginning of 1965 the national stockpile amounted to about 300,000 long tons, compared with a stockpile objective of 173,000 long tons determined in April 1964 by the Office of Emergency Planning (OEP). In the early part of 1966 the OEP determined that there was no longer a need for maintaining a stockpile of refractory-grade calcined bauxite in excess of the stockpile objective. Pursuant to this determination, on April 14, 1966, the Congress authorized the General Services Administration to sell a total of 126,300 long tons of this material held in the national stockpile (P.L. 89-394, 80 Stat. 119). Between April 1966, when the first sales were made, and April 1967 about 75,000 long tons of Government-owned refractory-grade calcined bauxite were sold.

In the United States a few companies located in Arkansas, Alabama, and Georgia produce calcined bauxite in integrated operations that include the mining of bauxite. Annual output increased moderately though steadily from 44,000 long tons in 1961 to 73,000 long tons in 1965 and averaged 57,000 long tons during the 5-year period. Most of the domestic output goes to nearby concerns in Missouri for the manufacture of refractories and to Texas and the East Coast States for the manufacture of catalysts and chemicals.

U.S. exports of calcined bauxite are not separately shown in official statistics; they are believed to be nil.

Annual U.S. imports of calcined bauxite during 1961-65 rose from 70,000 long tons to 216,000 long tons and averaged 156,000 long tons (table 1). Nearly all of the imported material was used in the manufacture of refractories. While the ratio of imports to total consumption during 1961-65 averaged 72 percent, the proportion of calcined bauxite supplied by imports for the domestic manufacture of refractories was substantially larger. British Guiana and Surinam have been virtually the only sources of imports (table 2).

Table 1.--Calcined bauxite: U.S. production, imports for consumption, and apparent consumption, 1961-66

Year	Production 1/	Imports	Apparent consumption	Ratio of imports to consumption
	1,000 long tons	1,000 long tons	1,000 long tons	Percent
1961	44	70	114	61
1962	52	120	172	70
1963	56	183	239	77
1964	59	189	248	76
1965	73	216	289	75
1966	2/	204	2/	2/

1/ Estimated from data on consumption of dried bauxite as reported by the U.S. Bureau of Mines on the basis of 1 long ton of calcined bauxite being equivalent to 1.5 long tons of dried bauxite.
2/ Not available.

Source: Compiled from official statistics of the U.S. Department of Commerce, except as noted.

Note.--Exports, not separately reported, are believed to have been nil during the period 1961-65.

Table 2.--Calcined bauxite: U.S. imports for consumption, by principal sources, 1961-66

Country	1961	1962	1963	1964	1965	1966
	Quantity (1,000 long tons)					
British Guiana	46	77	145	142	159	145
Surinam	24	33	38	41	48	40
All other	1/	10	1/	6	9	19
Total	70	120	183	189	216	204
	Value (1,000 dollars)					
British Guiana	1,080	1,747	3,317	3,554	4,162	4,325
Surinam	598	967	860	869	1,143	1,036
All other	1	44	2	164	263	644
	1,679	2,758	4,179	4,587	5,568	6,005

1/ Less than 500 tons.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Commodity	TSUS item
Brazilian pebble, crude	521.21

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (1968).

U.S. trade position

The United States depends upon imports of all its requirements of natural crude Brazilian pebble (quartz crystal).

Comment

This summary covers crude Brazilian pebble, i.e., natural quartz crystal as mined, except individual crystals suitable as gem stones (see summary on item 520.11). Quartz crystal, which occurs in the form of hexagonal prisms unless rounded by abrasion, is usually found in pockets of deeply weathered quartz veins or blanket deposits of milky quartz. The term "Brazilian pebble" originated from the fact that Brazil has long supplied virtually all the quartz crystal entering international trade. It is commercially important because of its stability under wide variations in temperature and its piezoelectric properties--the ability to generate an electrical force when placed under stress and conversely, to change dimensions when subjected to an electrical charge. It also transmits the short waves of ultraviolet light.

Individual quartz crystals vary greatly in size and quality. Many of them have defects, such as cracks and fractures, which preclude their use for certain purposes. They are marketed in two grades, electronic or piezoelectric quartz and fusing quartz. Electronic quartz is used chiefly in the manufacture of oscillators for controlling the frequency of telephone circuits, radio transmitters and receivers, and crystal-controlled chronographs and emission counters. It is used also in receiving circuits to exclude incoming signals of undesired frequencies, in sound detecting devices, and in various precision instruments. Because of its optical properties, quartz crystal is used in the manufacture of prisms, wedges, lenses and other optical instruments.

Fusing-grade quartz--known as lasca--consists of crystals not meeting the electronic-grade requirements. Lasca is used principally to produce fused-quartz articles such as tubes, rods, and other scientific ware, and as the "feed" (source of silica) for growing synthetic quartz crystal. Natural quartz crystal encounters competition in some electronic uses from synthetic quartz crystal. Although synthetic crystal is higher priced than natural crystal, it is more nearly uniform in quality and competes successfully with natural quartz crystal in many uses.

Imports of crude Brazilian pebble are duty free. The duty-free treatment was provided for under paragraph 1636 of the original Tariff Act of 1930 and has been bound since July 31, 1948, in a concession granted by the United States in the General Agreement on Tariffs and Trade.

Domestic consumption of natural quartz crystal approximates imports. As far as is known, natural quartz crystal is not produced in the United States.

Quartz crystal has been stockpiled by the U.S. Government as a strategic and critical material. At their peak the national and supplemental stockpiles amounted to about 5.7 million pounds. Although consisting of electronic-grade crystal, a substantial part of the material held in the stockpile failed to meet the strategic specifications set by the Munitions Board. In 1959 and again in 1961 the Office of Civil and Defense Mobilization determined (24 F.R. 9068 and 26 F.R. 1642) that there was no longer any need for maintaining a stockpile of crude quartz crystal larger than the stock-pile objective, which was 650,000 pounds as previously set by the Munitions Board and reaffirmed by the Office of Emergency Planning on March 5, 1964. 1/ The General Services Administration offered limited amounts of such material for sale. On October 31, 1965, Congress authorized the General Services Administration (P.L. 89-310, 89th Cong. 1st sess.) to sell a total of about 4.9 million pounds of quartz crystal held in the national stockpile. Sales are now being made at the rate of 30,000 pounds quarterly, or 120,000 a year. Between 1960, when the first sales occurred, and March 1967 about 440,000 pounds of Government-owned quartz crystal was sold by the General Services Administration.

During 1961-65 annual imports of quartz crystal fluctuated irregularly and averaged close to 1 million pounds, valued at $780,000 (see accompanying table). In recent years, imports have consisted mostly of fusing quartz (valued at not over 50 cents per pound). In the period 1964-65, imports of that grade accounted for nearly 70 percent of total imports of quartz crystals. Brazil has been the sole supplier. Official export statistics regularly show exports of quartz crystal, natural and synthetic, unworked or worked, not enumerated. Any exports of natural crude quartz crystal included in official export figures would represent exports of imported material.

Brazil is practically the sole source of natural quartz crystal, most of it being produced in the States of Minas Gerais, Goiás, Bahia, and Pará. Virtually all of the Brazilian output is exported, mostly to the United States.

1/ U.S. House Committee on Armed Services, H. Rept. 1045 (89th Cong., 1st sess.), Sept. 21, 1965.

Brazilian pebble (quartz crystal): U.S. imports for consumption, 1961-66

Year	Valued not over 50¢ per pound 1/		Valued over 50¢ per pound 2/		Total	
	Quantity	Value	Quantity	Value	Quantity	Value
	1,000 pounds	1,000 dollars	1,000 pounds	1,000 dollars	1,000 pounds	1,000 dollars
1961	319	37	854	762	1,173	799
1962	611	112	325	731	936	843
1963	431	100	282	447	713	547
1964	570	113	264	532	834	645
1965	858	170	324	913	1,182	1,083
1966	1,205	300	265	596	1,470	896

1/ Fusing grade.
2/ Electronic grade.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Commodity	TSUS item
Coal, coke, and compositions thereof---------	521.31

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated-1968.

U.S. trade position

The United States is one of the leading world producers of the commodities covered by this summary. Although exports greatly exceed imports, both are very small compared with domestic production.

Description and uses

This summary covers (1) the basic forms of coal, and (2) products of coal and carbon residues.

Coal is composed largely of carbon and other elements, principally hydrogen, oxygen, nitrogen, and sulfur. It is classified (ranked) into three principal types--lignite, bituminous coal, and anthracite. Aside from the differences between the three principal types, variations in character and composition occur also within each type; consequently there are a number of distinguishable intermediate types and subclassifications of the principal types. As a rule, the rank of coal is determined by the fixed carbon content in the higher-rank coals, and by heating value and caking and weathering properties in the lower-rank coals.

Lignite is the lowest rank of coal; it contains about 33 percent fixed carbon. It is used primarily for heating purposes, but owing to its low heating value compared with other coal and because long distance shipments are uneconomic, lignite is generally used near its source.

Bituminous coal is the most abundant type of coal and the most important in terms of quantity and value of annual output. Subbituminous coal, the lowest grade, has a higher heating value than lignite, but like lignite, it deteriorates when exposed to air and is used principally in areas where it is mined. Regular bituminous coal (as distinguished from subbituminous coal) contains from 14 to 40 percent volatile matter and fixed carbon ranging from 49 to 79 percent. It occurs in several different varieties, but the main distinction is made between coking and noncoking types. Fine particles of bituminous coal derived during mining and processing are called slack.

Bituminous coal is used chiefly for heat and power production and in the manufacture of metallurgical coke. It competes with anthracite, lignite, natural gas, petroleum, and atomic energy.

Anthracite or "hard" coal is the highest ranking coal. It has a low content of volatile matter, ranging from 1.5 to 8.5 percent; and a fixed carbon content ranging from 65 to 92 percent. Anthracite is produced in a wide range of sizes, each of which might be used for different purposes. It includes culm, formerly a small-sized waste product from anthracite preparation plants, now being recovered from old culm and silt banks near the principal mining areas.

Anthracite is the preferred coal for space heating, where most of it is consumed, because it burns slowly and cleanly with a minimum ash residue and requires a minimum of attention. Substantial quantities are used also by electric utilities. Lesser amounts are consumed in combination with bituminous coal for the manufacture of coke, in sintering iron ore fines, in pelletizing low-grade iron ore, and as electrode material. Natural gas, fuel oil, lignite, and bituminous coal compete with anthracite in its major uses.

Products of coal and carbon residue included in this summary consist of coke and briquettes and packaged fuel made from coal and coke.

Coke is the hard, porous carbon residue left after the distillation of volatile matter from bituminous coal or a mixture of bituminous coal and anthracite; the term also applies to a similar residue from petroleum refining. The difference between the two types of coke is that petroleum cokes usually are higher in fixed carbon and lower in ash than coal cokes.

Coal coke is made in two principal types of ovens: the relatively primitive beehive ovens, which do not permit recovery of byproducts, and the vertical slot-type ovens (referred to as byproduct ovens) which recover such byproducts as gas, light oil, ammonia, and tar. Another byproduct in the production of coal coke, coke screenings and fines, is referred to as breeze. Coal coke is a vital metallurgical fuel used predominately in blast furnaces. Lesser quantities are used in foundries and industrial plants as fuel. Breeze is used primarily in sintering and agglomerating iron ores and as a reducing agent in the production of elemental phosphorus. There are no satisfactory substitutes for metallurgical coke in its major applications.

Petroleum coke is produced as a byproduct in the distillation of hydrocarbon oils. Most petroleum coke cannot be recovered and is burned off of catalytic cracking units as refinery fuel. Of that which is recovered, about half is calcined for use in the manufacture

of carbon products and the rest is used as fuel in miscellaneous applications. In some of its uses, petroleum coke competes with coal, coal coke, and carbon black.

Fuel briquettes and packaged fuel (both known as composition fuels) are made from fine-sized solid fuels (bituminous coal, anthracite, or coke) that are mixed with a binder and compacted with heat and pressure. They differ in physical properties and manner of use. Briquettes generally are produced in pillow-shaped form, 2 to 4 inches long, and are made with a water insoluble binder. This allows them to be handled and used as bulk solid fuel. Packaged fuel is produced in 3-or 4-inch cubes that are wrapped together in heavy kraft paper to form a package that is burned as a unit. Briquettes are used principally for cooking and residential heating, whereas packaged fuel is a specialty fuel used largely to supplement other space heating fuels.

U.S. tariff treatment

Imports of coal, coke commercially suitable for use as fuel, and compositions of coal, coke, or other carbonaceous material, used for fuel, are free of duty under TSUS item 521.31. Duty-free status was provided for in paragraphs 1650 and 1719 (lignite) of the original Tariff Act of 1930. 1/ Under the Revenue Act of 1932, an import-excise tax of 10 cents per hundred pounds was imposed on coal, coke, and fuel briquettes; the tax was inapplicable, however, to imports from any country if U.S. exports of the products as a group exceeded U.S. imports of such products from that country in the previous year or if treaty provisions of the United States provided otherwise. The TSUS now provides a duty-free status for all the products here under consideration and inasmuch as there had been no taxable imports for a number of years before 1963, the contingent import-excise tax was repealed by section 302(d) of the Tariff Classification Act of 1962 (P.L. 87-456). The free import duty status has been bound since January 1, 1948, as a concession granted by the United States in the General Agreement on Tariffs and Trade.

1/ Under the original act of 1930, however, there was a contingent provision that coal imported from any country that imposed a duty on U.S. coal would be dutiable at the rate imposed by the other country; this provision was repealed by Public Law 316 of June 12, 1934.

U.S. consumption

Bituminous coal and lignite.--For convenience, the term coal is used hereafter in the text of this summary to refer to both bituminous coal and lignite. Annual domestic consumption of coal has increased in recent years reversing a downward trend which had been apparent since the end of World War II. Consumption steadily increased from about 374 million tons 1/ in 1961 to 459 million tons in 1965 (table 1). It averaged 412 million tons annually in the 5-year period, which was 2 percent less than the average in the corresponding period a decade earlier and 5 percent larger than the 1956-60 average.

Because of increasing competition from other fuels, such as petroleum and natural gas, there have been significant shifts in the use pattern of coal during the past 20 years. Substantial reductions have occurred in the use of coal by railroads, by bunkers (ocean and lake vessels), and by retail dealers (mostly for space heating). These reductions have been offset to an increasing degree by the expansion of the use of coal in the generation of electric power.

During 1961-65 about half of total domestic consumption of coal was accounted for by electric power utilities, one-fifth by coke plants, and the remainder chiefly by retail dealers, by steel and cement mills, and other industrial plants. Compared with 1956-60, consumption of coal during 1961-65 by electric power utilities rose by about 30 percent and that by steel mills by 5 percent. The use of coal in all other applications declined largely because of shifts by consumers to competing fuels, but in part also because of technological developments.

Anthracite.--Domestic consumption of anthracite continued a long term decline from a wartime peak of about 59 million tons in 1944. Annual apparent consumption during 1961-65 declined almost steadily from about 16 million tons to 14 million tons (table 2). It averaged 15 million tons in the 5-year period which was almost 29 percent lower than the average in the 5-year period immediately preceding. The apparent consumption is somewhat overstated inasmuch as the export data do not include shipments of anthracite abroad for use by the U.S. armed forces. Available information indicates that such shipments ranged from about 0.4 million to 1.3 million tons annually in recent years.

The largest outlet for anthracite has always been the space heating market principally in the Middle Atlantic States and New England. Of the total domestic consumption of anthracite during 1961-65, about 53 percent was used for space heating, 16 percent for

1/ All tonnage figures in the text are in short tons.

the generation of electric power, 13 percent by the iron and steel industry, principally for the manufacture of coke, sintering iron ore fines, and the pelletization of low-grade iron ores. The remainder was used in a number of miscellaneous applications such as the production of industrial carbon, the manufacture of fuel briquettes, and as a fuel in brick and ceramic kilns.

The long-term contraction of the market for anthracite reflects competition from natural gas and fuel oil, the use of which is generally more convenient, and which have become increasingly available in the principal anthracite consuming centers. The consumption of anthracite has declined in recent years in all principal applications, except in iron and steel manufacture. During 1961-65, and compared with the period 1956-60, the use of anthracite for space heating dropped by about 36 percent, the use by electric utilities declined by 23 percent, and miscellaneous uses decreased by 30 percent. Anthracite used by the iron and steel industry rose by 6 percent resulting primarily from an increase in the production of pelletized iron ore.

Coke.--Annual domestic apparent consumption of coal coke, including breeze, during 1961-65 increased from 56 million tons to 70 million tons (table 3), and averaged 61 million tons. Of this amount 94 percent consisted of coke and 6 percent of breeze.

Blast furnaces have traditionally utilized the bulk of the available supply of coal coke. In 1961-65 about 91 percent of the total consumption of coal coke, exclusive of breeze, was used in blast furnaces in the production of pig iron and ferroalloys, 5 percent in foundries in the manufacture of cast iron, and the remainder was consumed as fuel, principally in industrial plants, and for residential heating.

The average annual rate of consumption of coal coke, exclusive of breeze, during 1961-65 of 57 million tons was about 10 percent lower than the corresponding average in 1956-60. The decline in the volume of coke used in 1961-65 compared with the 5-year period immediately preceding is attributable in large part to coke-saving improvements in blast furnaces. Consumption of coke by blast furnaces was about 8 percent less in 1961-65 than in 1956-60. Consumption of coal coke in iron and steel foundry operations and as fuel in industrial plants increased by about 9 percent and 2 percent, respectively, in 1961-65 over 1956-60, whereas coke used for residential heating sharply declined to about one-third its former volume.

The apparent consumption of breeze increased from 3.4 million tons in 1961 to 4.1 million tons in 1965; it averaged 3.8 million tons annually during the period, or about 7 percent less than the average in 1956-60. In recent years the principal application of

breeze has been for sintering iron ore. During the past decade, the quantity so used has doubled and during 1961-65 accounted for close to 45 percent of the total consumption of breeze. The amount of breeze used in steam generating plants (previously the chief outlet) in 1961-65 was about two-fifths of its former volume and accounted for about 17 percent of total consumption. The remainder was used principally as a reducing agent in the production of elemental phosphorus (which accounted for 27 percent of the consumption in 1961-65) and in miscellaneous applications. Annual consumption of breeze for production of phosphorus and for miscellaneous uses has not changed significantly during the past decade.

Petroleum coke.--Annual domestic apparent consumption of petroleum coke has increased almost continually since the end of World War II; it nearly tripled between 1956 and 1965. In the latter year, consumption amounted to 14.7 million tons (table 4). About two-thirds of the petroleum coke, however, was consumed within the producing plants during catalytic cracking of petroleum. The remainder was used in about equal parts as a source of carbon and as a fuel in other industries.

Fuel briquettes and packaged fuels.--Domestic consumption of briquettes and packaged fuel has continued its long term downward trend. Annual apparent consumption of briquettes and packaged fuels during 1961-65 declined from 581,000 tons to 294,000 tons (table 5). Consumption in 1965 was only about one-fifth as large as in 1956. This decline reflects primarily the increasing availability of other fuels for space heating purposes. In recent years about four-fifths of the briquettes consumed were used in the Central and North Central States, principally Michigan, Wisconsin, and Minnesota. Packaged fuels are generally consumed in areas close to the producing plants.

U.S. producers

The commodities covered by this summary are produced in the United States by a large number of different establishments in various parts of the country. In 1965, coal of all types was produced by about 8,200 mines and the industry employed an average of nearly 145,000 workers, including 134,000 engaged in producing bituminous coal and lignite and 11,000 in producing anthracite. Of the total number of active mines in 1965, close to 7,200 produced bituminous coal, 33 produced lignite, and about 1,000 were the sources of anthracite. The number of bituminous coal mines by regions in 1965,

according to data published by the U.S. Bureau of Mines, were as follows:

Region and State	Number of Mines
Middle and South Atlantic: Maryland, Pennsylvania, Virginia, and West Virginia	4,140
East and West North Central: Illinois, Indiana, Iowa, Kansas, Missouri, and Ohio	618
East and West South Central: Alabama, Arkansas, Kentucky, Oklahoma, and Tennessee	2,286
Mountain and Pacific States: Alaska, Colorado, Montana, New Mexico, Utah, Washington, and Wyoming	151
Total	7,195

About four-fifths of the bituminous coal mines were located in Kentucky, West Virginia, Virginia, and Pennsylvania.

The bituminous coal industry consists of an indeterminate number of concerns ranging in size from large companies operating numerous mines to small individual enterprises. Some of the bituminous coal mines are owned and operated by large coal consumers, such as producers of steel and electric utilities. According to information published by the Keystone Coal Buyers Manual, about 16 percent of the U.S. coal output in 1965 was produced by such consumer-owned mines.

Of the 33 mines producing lignite in 1965, 29 were located in North Dakota, 3 in Montana, and 1 in South Dakota. Nearly all of the anthracite mines are located in the northeastern part of Pennsylvania.

During 1965 coke was produced in the United States by 174 plants of which 86 produced coal coke and 88 petroleum coke. Coal coke plants were located in 21 states. Because this type of coke is used principally for blast furnace fuel, the producing plants are located primarily in the steel-producing area of the Eastern and North Central States, Pennsylvania, Indiana, Ohio, New York, New Jersey, Maryland, Connecticut, and Alabama.

The bulk of the domestic output of coal coke is produced in plants using slot-type ovens. In 1965 about 98 percent of the total output was produced in 65 such plants, the balance came from 21 plants using beehive ovens. Forty-eight of the plants using slot-type ovens were owned by or financially affiliated with iron and steel companies

and produced coke mainly for use in blast furnaces of the parent companies. The remaining slot-type oven plants were independent concerns that produced coke for sale in the open market.

As previously stated, there were 88 petroleum refineries in the United States producing petroleum coke in 1965. The main producing areas are the East Coast States (principally Pennsylvania and New Jersey), the Texas and Louisiana Gulf Coast, and California. Aggregate production in these areas in 1965 accounted for nearly 60 percent of total U.S. output.

Fuel briquettes were produced in 1965 in 10 plants located in 5 States--Wisconsin, West Virginia, Michigan, Missouri, and North Dakota. Since the demand for briquettes is seasonal, some of the producing plants operate only during part of the year.

The number of establishments producing packaged fuels in the United States declined from 16 in 1961 to 7 in 1965, reflecting the drop in the demand for these fuels. Packaged fuels were produced in 5 States in 1965--Michigan, Illinois, Indiana, Ohio, and Virginia. As in the case of briquettes, the demand for packaged fuel is seasonal and producing plants generally operate only during part of each year.

U.S. production

Annual domestic production of coal (bituminous and lignite) increased from about 403 million tons in 1961, valued at $1.8 billion, to 512 million tons in 1965, valued at $2.3 billion (table 1). It averaged close to 457 million tons in the 5-year period, valued at $2 billion, which, although slightly larger in quantity, was about 6 percent lower in value than the average in 1956-60. Nearly all of the output consisted of bituminous coal; production of lignite accounted for less than 1 percent of total coal production in all years.

By far the greater part of the domestic output of coal is produced in West Virginia, Kentucky, Pennsylvania, Illinois, and Ohio. These five States accounted for about four-fifths of U.S. production in 1965; West Virginia, the chief producing State, accounted for about 30 percent.

Available data on domestic production of anthracite only cover the output of Pennsylvania which, although not the only producing State, is the predominant domestic source of this type of coal. Production in other States, relatively small and sporadic and consisting mostly of semi-anthracite, is regularly reported by the Bureau of Mines with the data on bituminous coal.

Annual U.S. production of anthracite declined irregularly from about 17.4 million tons, valued at $140 million, in 1961 to 14.9 million tons, valued at $122 million, in 1965 (table 2). The average output in the 5-year period of 17 million tons, valued at $140 million, was about 20 percent lower in quantity and 28 percent lower in value than the corresponding average during 1956-60, reflecting the declining demand for this type of coal.

Although the domestic production of coal coke (including breeze), steadily increased from about 55 million tons, valued at about $1 billion, in 1961, to 71 million tons, valued at $1.2 billion, in 1965 (table 3), the average annual level of output in this period was about 10 percent lower by quantity and 12 percent lower by value than the average in the preceding 5-year period. Pennsylvania, Indiana, Ohio, Alabama, and Michigan, in that order, are the principal producing States. Aggregate output of these five States in 1965 accounted for over two-thirds of total production.

Almost all the domestic output of coal coke is produced by large integrated iron and steel companies for their own use. About seven-eighths of the production in 1961-65 was used by the producing companies, principally in blast furnaces; the remainder was sold in the open market. Similarly, about three-fourths of the output of breeze in this period was used by the producing concerns in their own integrated operations.

Annual domestic production of petroleum coke, including coke used as a catalyst fuel in the producing plant, rose steadily from about 15 million tons in 1961 to a high of 17.2 million tons in 1965 (table 4). The average annual level of output in this period of 16.2 million tons was about twice that of the preceding 5-year period. Only about 40 percent of the production during 1961-65 was marketed; the remainder was coke burned off of catalytic cracking units.

Annual domestic production (shipments) of composition fuels dropped sharply from 587,000 tons, valued at about $8.4 million, in 1961 to 369,000 tons, valued at $6.4 million, in 1965 (table 5). The average annual level of production in this period of 496,000 tons, valued at $7.7 million, was 55 percent lower in quantity and 49 percent lower in value than that in the preceding 5-year period. Fuel briquettes, which are by far the more important of the two types of composition fuels, accounted for 97 percent of total output in 1961-65.

Production of both briquettes and packaged fuel greatly declined although the reduction was proportionally less for briquettes. During 1961-65 the average level of output of briquettes was a little over half as large as in 1956-60, whereas that of packaged fuel was

two-thirds less. Nearly half of the production of briquettes in 1965 came from Wisconsin, whereas the bulk of the packaged fuel originated in Michigan.

Yearend stocks

Data on yearend stocks are regularly published by the Bureau of Mines for (1) bituminous coal and lignite (partial coverage), (2) coal coke, and (3) petroleum coke. Stocks of bituminous coal and lignite in the hands of commercial consumers and in retail dealers' yards followed the trend of production and increased from 71 million tons in 1961 to 77 million tons in 1965. They averaged 73 million tons in the 5-year period which was equivalent to 16 percent of average annual domestic production.

Stocks of coal coke (including breeze) in the hands of producers declined from about 5.5 million tons in 1961 to 3.1 million tons in 1964 and then increased to 3.8 million tons the following year (table 3). About 72 percent of the stocks during 1961-65 consisted of coal coke and 28 percent of breeze. Producers' stocks of coal coke averaged 3.1 million tons in this period and were equivalent to 5 percent of average annual domestic production. Those of breeze averaged 1.2 million tons and were equivalent to nearly 33 percent of average annual domestic production.

Producers' stocks of petroleum coke increased from 1 million tons in 1961 to 1.5 million tons in 1965. They averaged 1.3 million tons and were equivalent to 20 percent of average annual domestic production of petroleum coke (excluding catalyst coke).

U.S. exports

U.S. exports of the commodities covered by this summary, though much larger than imports, have been small compared with production. Annual exports of bituminous coal and lignite increased from about 35 million tons, valued at $319 million, in 1961 to 50 million tons, valued at $466 million in 1965 (table 1). They averaged close to 44 million tons and were equal to about 10 percent of domestic production in the 5-year period. Canada, Japan, and the countries of the European Economic Community (Common Market) were the principal export markets (table 6).

Annual U.S. exports of anthracite ranged from less than 1 million tons, valued at over $11 million, to 3.4 million tons, valued close to $44 million (table 2) and were equal to nearly 11 percent

of domestic production during 1961-65. Canada has been the chief foreign market in all recent years except 1963 when most exports went to the Netherlands (table 7).

Exports of coal coke were equivalent to less than 1 percent of domestic production in 1961-65. They averaged 530,000 tons annually during the period and ranged from 394,000 tons, valued at $7.4 million in 1962 to 834,000 tons, valued at $16.3 million in 1965 (table 3). Canada has been by far the principal market (table 8); shipments to that country accounted in recent years for about four-fifths of total exports.

The United States exports a much larger proportion of its output of petroleum coke than of coal coke. Exports of petroleum coke, including calcined petroleum coke, rose from 1.5 million tons in 1961 to a high of 2.7 million tons in 1964 and then declined to 2.4 million tons in 1965 (table 4). They were equal to 31 percent of the domestic output of marketable petroleum coke during 1961-65. Japan, the Netherlands, and Canada have been major foreign outlets (table 9). Together these three countries have been the market for over half of the petroleum coke exported in recent years.

U.S. exports of composition fuel averaged 15,000 tons, valued at $206,000 during 1961-64 (table 5) and were equal to about 3 percent of domestic production in that period. The export figure shown for 1965 includes lignite and is therefore not comparable with data for earlier years. Exports for years before 1965 consisted of briquettes only. As far as is known there are no exports of packaged fuel. Canada has been by far the principal foreign market and during 1961-65 accounted for more than four-fifths of total exports.

U.S. imports

U.S. imports of coal represent only a small fraction of 1 percent of domestic consumption. In the period 1961-65 they averaged about 228,000 tons a year, valued at $1.8 million. Imports consisted almost entirely of bituminous coal and lignite from Canada.

U.S. import statistics do not segregate coal coke from petroleum coke. Imports of all types of coke have been very small, amounting to a fraction of 1 percent of domestic consumption. Annual imports of coke increased from 127,000 tons, valued at $1.5 million in 1961 to 153,000 tons, valued at $2 million in 1963 and then declined to 90,000 tons, valued at $1.4 million, in 1965 (table 3). Canada has been virtually the only source of supply.

Imports of composition fuel consist of fuel briquettes. They rose from an annual average of 7,000 tons in 1961-63 to 13,000 tons in 1965 (table 5). The value of imports varied widely from $82,000 in 1963 to $410,000 in 1962. The imports (in terms of quantity) were equal to about 4.5 percent of domestic consumption of briquettes in 1965. Canada has been the only supplier in recent years.

Foreign production

Based on world statistics published by the U.S. Bureau of Mines, coal is produced by some 60 countries throughout the world. Estimated total world output amounted to close to 3.1 billion tons in 1965, of which 67 percent was bituminous coal, 26 percent lignite, and 7 percent anthracite. The Soviet Union, the United States, Mainland China, West Germany, and the United Kingdom were the principal world producers, accounting together for almost two-thirds of total world output. The United States, the leading free-world producer, accounted for 17 percent of total world output.

The five countries named above are also the principal producers of bituminous coal. Of the total world output of bituminous coal--about 2.1 billion tons in 1965--the five countries accounted for about 70 percent, the United States being the leading producer with 25 percent of the total.

Anthracite is mined in 24 countries which in 1965 produced an estimated 209 million tons. The Soviet Union, the principal producing country, accounted for over two-fifths of total world production. Other major producers are Mainland China, West Germany, and the United States.

Estimated world output of lignite amounted to about 816 million tons in 1965. Lignite is produced in 30 countries of which East Germany, the Soviet Union, and West Germany are the leading producers. Aggregate output in these countries in 1965 accounted for about two-thirds of total world production; East Germany, the principal producer, accounted for one-third.

World production of metallurgical coke in 40 countries in 1965 was estimated at 341 million tons. The Soviet Union, the world's largest producer, accounted for nearly one-fourth of total world output. The United States, with one-fifth of the world output, ranked second, and West Germany, with one-seventh, ranked third. In addition to metallurgical coke, an estimated 46 million tons of other coal coke was produced in 35 countries in 1965. The leading producers were East Germany, the United Kingdom, and West Germany. Together these three countries accounted for over half of total world production. No world data are available on petroleum coke and on composition fuels.

Table 1.--Bituminous coal and lignite: U.S. production, imports for consumption, exports of domestic merchandise, and consumption, 1961-66

Item	1961	1962	1963	1964	1965	1966
	Quantity (1,000 short tons)					
Production:						
Total	402,977	422,149	458;928	486,998	512,088	1/
Lignite	3,018	3,055	2,705	2,950	3,043	1/
Bituminous	399,959	419,094	456,223	484,048	509,045	1/
Imports	164	232	2/ 267	293	184	178
Exports	34,974	38,413	47,078	47,969	50,269	49,420
Consumption 3/	374,405	387,774	409,225	431,116	459,164	1/
	Value (millions of dollars)					
Production:						
Total	1,845	1,892	2,013	2,166	2,274	1/
Lignite	7	7	6	6	7	1/
Bituminous	1,838	1,885	2,007	2,160	2,267	1/
Imports	1	2	2/ 2	2	2	2
Exports	319	351	430	441	466	460
Consumption	4/	4/	4/	4/	4/	4/

1/ Not available.
2/ Beginning September 1, 1963 includes anthracite; imports of anthracite are known to have been small.
3/ Consumption quantity data published by the Bureau of Mines and not calculated from production, imports, and exports.
4/ Not reported.

Source: Production and consumption compiled from official statistics of the U.S. Bureau of Mines; imports and exports from official statistics of the U.S. Department of Commerce.

Table 2.--Anthracite: U.S. production, imports for consumption, exports of domestic merchandise, and apparent consumption, 1961-66

Year	Production	Imports	Exports 1/	Apparent consumption
	Quantity (1,000 short tons)			
1961	17,446	1	1,546	15,901
1962	16,894	8	1,869	15,033
1963	18,267	2/5	3,353	14,919
1964	17,184	-	1,575	15,609
1965	14,866	-	851	14,015
1966	3/	-	766	3/
	Value (1,000 dollars)			
1961	140,338	10	22,354	117,994
1962	134,094	63	25,666	108,491
1963	153,503	44	43,669	109,878
1964	148,648	-	22,060	126,588
1965	122,021	-	11,488	110,533
1966	3/	-	9,755	3/

1/ Does not include anthracite shipped abroad for the use of the U.S. Armed Forces. Based on information received from the Department of Defense such shipments were as follows:

Fiscal year	1,000 short tons
1963	440
1964	1,092
1965	1,282
1966	1,007

2/ January-August only; beginning with September 1963 imports of anthracite have been combined with those of bituminous coal.

3/ Not available.

Source: Production compiled from official statistics of the U.S. Bureau of Mines; exports from official statistics of the U.S. Department of Commerce.

Table 3.--Coal coke: 1/ U.S. production, imports for consumption, exports of domestic merchandise, producers' stocks, and apparent consumption, 1961-66

Item	1961	1962	1963	1964	1965	1966
	Quantity (1,000 short tons)					
Production:						
Total	55,102	55,378	57,916	66,069	70,935	2/
Coke	51,711	51,910	54,278	62,145	66,854	2/
Breeze	3,391	3,468	3,638	3,924	4,081	2/
Imports 3/	127	142	153	103	90	96
Exports 4/	445	394	451	524	834	1,102
End of year stocks	5,470	5,188	4,019	3,085	3,762	2/
Apparent consumption	55,526	55,408	58,787	66,582	69,514	2/
	Value (millions of dollars)					
Production:						
Total	969	987	1,002	1,155	1,154	2/
Coke	918	939	952	1,102	1,126	2/
Breeze	51	48	50	53	28	2/
Imports 3/	2	2	2	2	1	2
Exports 4/	8	7	8	10	16	23
End of year stocks	2/	2/	2/	2/	2/	2/
Apparent consumption	2/	2/	2/	2/	2/	2/

1/ Includes coke screenings and fines known as breeze.
2/ Not available.
3/ May include small quantities of petroleum coke.
4/ Includes peat coke and coke briquets.

Source: Production and stocks compiled from official statistics of the U.S. Bureau of Mines; imports and exports from official statistics of the U.S. Department of Commerce.

Table 4.--Petroleum coke: U.S. production, exports of domestic merchandise, stocks, and apparent consumption, 1961-66

Year	Production 1/	Exports 2/	End of year stocks	Apparent consumption
	Quantity (1,000 short tons)			
1961	15,067	1,454	1,063	13,427
1962	15,745	1,491	1,176	14,141
1963	16,138	2,153	1,297	13,864
1964	16,865	2,724	1,359	14,079
1965	17,208	2,368	1,478	14,721
1966	3/	2,899	3/	3/

1/ Converted from barrels at the rate of 5 barrels per short ton.
2/ Includes calcined petroleum coke.
3/ Not available.

Source: Production and stocks compiled from official statistics of the U.S. Bureau of Mines; exports compiled from official statistics of the U.S. Department of Commerce.

Table 5.--Briquets and packaged fuels: U.S. production, shipments, imports for consumption, exports of domestic merchandise, and consumption, 1961-66

(Quantity in thousands of short tons; value in thousands of dollars)

Year	Production			Imports	Exports	Apparent consumption	Ratio of imports to consumption
	Total	Briquets	Packaged fuel				
	Quantity						
1961	587	568	19	7	13	581	1.2
1962	587	570	17	8	19	576	1.4
1963	566	551	15	5	12	559	0.9
1964	370	360	10	12	18	364	3.3
1965	369	361	8	13	1/ 88	294	4.4
1966	2/	2/	2/	11	118	2/	2/
	Value						
1961	8,397	7,956	441	370	176	8,591	4.3
1962	8,991	8,597	394	410	233	9,168	4.5
1963	8,548	8,208	340	82	207	8,423	1.0
1964	6,169	5,928	241	182	210	6,141	3.0
1965	6,397	6,187	210	205	1/1,137	5,465	3.8
1966	2/	2/	2/	163	2,160	2/	2/

1/ Figure includes lignite and therefore is not comparable with data for the other years shown.
2/ Not available.

Source: Production compiled from official statistics of the U.S. Bureau of Mines; imports and exports compiled from official statistics of the U.S. Department of Commerce.

Table 6.--Bituminous coal and lignite: U.S. exports by principal markets 1961-66

Country	1961	1962	1963	1964	1965 1/	1966
	Quantity (1,000 short tons)					
Canada	11,169	11,410	13,755	14,183	15,674	15,806
Brazil	979	1,316	1,156	1,101	1,211	1,739
Netherlands	2,425	3,187	4,170	3,990	3,371	3,165
Belgium	905	1,084	2,107	2,185	2,215	1,841
France	644	710	2,002	1,924	2,070	1,574
West Germany	4,216	4,812	5,508	5,161	4,730	4,895
Spain	228	766	1,406	1,407	1,377	1,194
Italy	4,733	5,837	7,612	7,860	8,931	7,806
Japan	6,610	6,465	6,053	6,515	7,491	7,791
Other	3,065	2,826	3,309	3,643	3,199	3,609
Total	34,974	38,413	47,078	47,969	50,269	49,420
	Value (1,000 dollars)					
Canada	98,127	98,089	116,899	117,397	133,283	129,507
Brazil	9,717	12,894	11,135	10,638	11,865	17,207
Netherlands	22,375	29,034	37,873	36,536	31,239	29,656
Belgium	8,031	9,901	20,105	20,798	21.015	17,643
France	5,974	6,904	18,728	18,925	20,163	15,350
West Germany	38,648	43,821	50,329	48,122	43,748	45,518
Spain	2,175	6,770	13,369	13,576	13,448	11,981
Italy	42,077	53,564	70,074	74,031	83,312	74,779
Japan	63,731	64,147	60,074	65,391	76,586	81,731
Other	28,214	26,196	31,278	35,802	31,793	36,687
Total	319,069	351,320	429,864	441,216	466,452	460,059

1/ Includes negligible quantities of coal and lignite briquets.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 7.--Anthracite: U.S. exports by principal markets 1/, 1961-66

Country	1961	1962	1963	1964	1965	1966
	Quantity (1,000 short tons)					
Canada	966	892	795	637	643	624
Belgium	66	205	540	140	31	-
France	64	141	724	292	30	9
Italy	68	140	260	208	39	32
Netherlands	105	133	829	201	3	-
Other	277	358	205	97	105	101
Total	1,546	1,869	3,353	1,575	851	766
	Value (1,000 dollars)					
Canada	15,785	14,166	12,190	9,043	8,582	7,916
Belgium	781	2,573	6,701	1,909	391	-
France	532	1,473	7,374	3,648	266	83
Italy	727	1,884	3,707	3,085	479	342
Netherlands	1,210	1,580	11,065	2,827	51	-
Other	3,319	3,990	2,632	1,548	1,719	1,414
Total	22,354	25,666	43,669	22,060	11,488	9,755

1/ Does not include anthracite coal shipped abroad for the use of U.S. Armed Forces.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 8.--Coal coke: U.S. exports by principal markets, 1961-66

Country	1961	1962	1963	1964	1965 1/	1966 1/
	Quantity (1,000 short tons)					
Canada	343	311	344	450	603	855
Mexico	8	10	14	19	58	124
Venezuela	-	-	-	20	82	51
Other	94	73	93	35	91	72
Total	445	394	451	524	834	1,102
	Value (1,000 dollars)					
Canada	6,680	6,052	6,502	8,268	12,452	18,165
Mexico	219	267	332	537	1,436	3,154
Venezuela	-	-	-	278	1,137	798
Other	1,314	1,105	1,484	1,010	1,282	1,298
Total	8,213	7,424	8,318	10,093	16,307	23,415

1/ Includes peat coke and coke briquets.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 9.--Petroleum coke: U.S. exports 1/ by principal markets, 1961-66

Country	1961	1962	1963	1964	1965	1966
	Quantity (1,000 short tons)					
Canada	303	324	260	360	306	423
Norway	118	115	136	130	171	183
France	54	57	74	189	116	149
West Germany	65	121	142	207	110	207
Italy	120	135	222	206	217	256
Netherlands	52	88	426	300	340	277
Japan	538	468	653	989	834	999
Other	204	183	240	343	274	405
Total	1,454	1,491	2,153	2,724	2,368	2,899
	Value (1,000 dollars)					
Canada	4,547	4,476	3,871	5,818	5,537	6,851
Norway	3,521	3,365	3,980	3,704	4,739	4,604
France	2,024	1,994	2,505	4,334	4,072	4,747
West Germany	1,298	2,082	2,696	2,784	1,765	2,536
Italy	2,811	2,856	3,496	3,205	3,642	4,272
Netherlands	459	851	3,673	2,725	3,218	3,136
Japan	10,223	9,552	11,770	15,133	12,146	13,117
Other	4,351	4,181	6,180	7,788	6,908	10,341
Total	29,234	29,357	38,171	45,491	42,027	49,604

1/ Includes calcined petroleum coke.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Commodity	TSUS item
China clay or kaolin----------	521.41

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (1968).

U.S. trade position

The U.S. is the world's largest producer of kaolin. Exports, which since 1962 have exceeded imports, have in recent years been equal to 5 percent of domestic production. Imports, consisting predominantly of pottery-grade kaolin, have supplied less than 4 percent of total domestic consumption.

Description and uses

China clay or kaolin is a white or nearly white clay consisting principally of the mineral kaolinite and formed by the decomposition of feldspathic rocks. The terms "china clay" and "kaolin" are designations of the same type of clay, but the trade generally refers to the domestic product as kaolin and the imported product as china clay; in this summary, the term kaolin will be used to include both designations.

Kaolins sold commercially vary widely in their properties, depending on the nature of the original deposits and the methods of purification and preparation used. The principal grades of kaolin are the paper and pottery grades.

The most important use of kaolin is as a coating and filling material in the manufacture of paper. Substantial quantities of kaolin are used also in ceramic whiteware and pottery, as a compounding agent in rubber, and in the manufacture of firebricks and other refractories. Lesser quantities of kaolin are consumed in the manufacture of cement, petroleum cracking catalysts, lineoleum, oilcloth, paints and chemicals, and other products.

U.S. tariff treatment 1/

The column 1 (or trade-agreement) rate of duty applicable to imports (see general headnote 3 of TSUSA (1968)) is as follows:

1/ See the pertinent section TSUSA (1968), reproduced in appendix A, for the rate of duty resulting from the sixth round of tariff negotiations that became effective on Jan. 1, 1968.

TSUS item	Commodity	Rate of duty
521.41	China clay or kaolin----------	67¢ per long ton

This rate which has been in effect since July 1, 1963, reflects a concession granted by the United States in the General Agreement on Tariffs and Trade.

Based on imports in 1965, the ad valorem equivalent of the specific duty on kaolin averaged 3.1 percent.

U.S. consumption

Annual U.S. consumption of kaolin has increased substantially during the past decade principally as a result of increased production of paper. In 1961-65 the average annual consumption was about 3.1 million tons, 1/ approximately 28 percent larger than the average in the preceding 5-year period. In recent years more than half of the kaolin was consumed in the manufacture of paper as coating and filling, about one-eighth was utilized as a compounding agent in rubber, and the remainder was used in the manufacture of a large number of different products, mostly in refractories and ceramic whiteware.

U.S. producers and production

The U.S. kaolin industry is composed of about 30 to 35 concerns. Fifteen of these companies produce about 95 percent of the total output and for most of them kaolin is their principal source of income. Producers in Georgia and South Carolina ordinarily account for over 90 percent of the total annual output; those in Georgia alone usually supply about 75 to 80 percent. Most of the remaining domestic output is mined in North Carolina, Florida, and California.

The United States is the world's largest producer of kaolin. Annual domestic production has been increasing for many years. During 1961-65 it rose from about 2.7 million tons, valued at $46.9 million, to about 3.6 million tons, valued at $69.5 million (see table). Production during this period averaged about one-third more by quantity and over one-half more by value than in the preceding 5-year period.

Domestically produced kaolin has supplied an increasing share of U.S. requirements chiefly because of technical advances in production and use. These have been evidenced by a great improvement in the quality of the domestic product and by technological adaptions to domestic kaolin by the consuming industries. In recent years domestic producers have supplied nearly all of the domestic demand for paper-grade

1/ All tonnage figures are in short tons unless otherwise specified.

kaolin and most of the demand for the pottery grade. The domestic paper-grade kaolin is said to perform better than the imported material in the modern high-speed papermaking machines.

U.S. exports

U.S. exports of kaolin have almost steadily increased in the past decade and since 1962 have exceeded imports in both quantity and value. During 1961-65 they averaged 135,000 tons a year, valued at $3.9 million (see table). Exports consisted largely of grades of kaolin used in the paper, pottery, and rubber industries.

Canada, with its extensive paper industry, has long been the principal foreign outlet; in 1965 slightly less than half of the total exports went to that country. Other important markets were Japan, Mexico, Italy, West Germany, Argentina, Venezuela, and France.

U.S. imports

Annual U.S. imports of kaolin irregularly declined during 1961-65 and reached a low of 92,000 tons in 1965, valued at about $1.8 million (see table). They averaged 112,000 tons in the 5-year period, valued at $2.1 million. Imports during that period consisted predominantly of pottery-grade kaolin, virtually all of which came from the United Kingdom. Although domestic producers supply most of the domestic demand for pottery kaolin, some domestic pottery manufacturers, reluctant to change their long-established formulas, depend upon the British material for most of their kaolin requirements. Imports in 1961-65 supplied less than 4 percent of total domestic consumption of kaolin but accounted for about 20 percent of the consumption of pottery kaolin.

Foreign production and trade

Some 50 countries produce kaolin. The United Kingdom is the second largest kaolin-producing country; its annual output is equivalent to approximately two-thirds of the U.S. output. About 65 percent of the British production was exported in 1965.

Other major kaolin-producing countries are India, West Germany, and Austria, but the output in each of these countries is considerably less than that of either the United States or the United Kingdom. West Germany and Austria each export from 10 to 20 percent of their production.

China clay or kaolin: U.S. production, imports for consumption, exports of domestic merchandise, and apparent consumption, 1961-66

(Quantity in thousands of short tons; value in thousands of dollars)

Year	Production 1/	Imports 2/	Exports	Apparent consumption	Ratio (percent) of imports to consumption
	Quantity				
1961	2,740	132	99	2,773	4.8
1962	2,998	112	119	2,991	3.7
1963	3,164	107	112	3,159	3.4
1964	3,331	117	152	3,296	3.5
1965	3,604	92	193	3,503	2.6
1966	3/	116	253	3/	3/
	Value				
1961	46,933	2,561	2,395	47,099	5.4
1962	53,495	2,147	2,939	52,703	4.1
1963	59,770	2,088	3,314	58,544	3.6
1964	64,607	2,263	4,671	62,199	3.6
1965	69,461	1,768	6,244	64,985	2.7
1966	3/	2,389	8,443	3/	3/

1/ Sold or used by producers.
2/ Virtually all from the United Kingdom. Quantities converted from reported long tons.
3/ Not available.

Source: Production compiled from official statistics of the U.S. Bureau of Mines; imports and exports compiled from official statistics of the U.S. Department of Commerce.

Commodity	TSUS item
Fuller's earth:	
Not beneficiated	521.51
Wholly or partly beneficiated	521.54

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (1968).

U.S. trade position

The United States is a large producer of fuller's earth, and domestic consumption is virtually all supplied from domestic sources. Exports are small, having been equal to less than 3 percent of domestic production in 1965. Imports are negligible.

Description and uses

Fuller's earth is a clay with a high degree of natural absorptive powers. It must usually be processed before use by grinding, extrusion, and drying. Fuller's earth is used chiefly as an absorbent in the bleaching of petroleum oils and other mineral and vegetable oils, fats, greases, and waxes, and as a carrier or diluent for insecticides and fungicides. Lesser quantities are used mainly as a viscosity-improving ingredient in well-drilling muds, and as an oil-absorbent medium for conditioning shop and factory floors, Fuller's earth competes in its chief use as an absorbent with activated clays (see summary on item 521.87). In other uses it competes with any inexpensive diluent, such as bentonite (see summary on item 521.61) and diatomite (see summary on item 522.11). The choice between the use of one or another of these materials frequently depends less on prices than on long-established methods of production which manufacturers are reluctant to change.

U.S. tariff treatment 1/

The column 1 (or trade-agreement) rates of duty applicable to imports (see general headnote 3 in TSUSA (1968)) are as follows:

TSUS item	Commodity	Rate of duty
	Fuller's earth:	
521.51	Not beneficiated	50¢ per long ton
521.54	Wholly or partly beneficiated	$1 per long ton

1/ See the pertinent sections of TSUSA (1968), reproduced in appendix A, for the rates of duty resulting from the sixth round of tariff negotiations that became effective on Jan. 1, 1968.

These rates reflect concessions granted by the United States in the General Agreement on Tariffs and Trade, and became effective on January 1, 1948.

Imports have been too small and too variable in grades to furnish an adequate basis for computing ad valorem equivalents of the specific rates of duty.

U.S. consumption, producers, production, and trade

U.S. consumption of fuller's earth, virtually all of which is supplied from domestic sources, has shown an upward trend in recent years. During 1961-65, annual domestic consumption increased almost steadily from 422,000 short tons to 674,000 short tons and averaged 508,000 short tons in the 5-year period. At that average level consumption was 30 percent larger than the average during 1956-60.

In recent years about 52 percent of the fuller's earth consumed was used as an absorbent in the bleaching of petroleum and other oils; 21 percent, in insecticides and fungicides; 12 percent in rotary drilling muds, and the remainder, in a number of miscellaneous applications. The rise in consumption during 1961-65 compared with the earlier 5-year period reflects increases in the use of this material as an absorbent in the bleaching of petroleum, and in insecticides. These increases were substantially larger than the decline in the use of this clay in rotary-drilling muds and some other less important applications.

Fuller's earth is produced in the United States by about 18 concerns. Six of them, located in Florida, Georgia, and Tennessee, account for about four-fifths of total annual domestic output. For two of the six companies the sale of fuller's earth is the principal source of revenue, whereas the other four concerns are diversified and also market other minerals and chemicals. A few of the less important firms produce the material for use in their own operations.

Annual domestic output of fuller's earth is equal to consumption since exports are small and imports are negligible. The following tabulation shows the domestic production (sold or used by producers) for the years 1961-65, as reported by the U.S. Bureau of Mines:

Year	Quantity (1,000 short tons)	Value (1,000 dollars)
1961----------	422	9,518
1962----------	410	9,377
1963----------	482	11,211
1964----------	552	12,743
1965----------	674	14,723

Approximately 60 percent of the domestic output of fuller's earth is mined in Florida, 25 percent is mined in Georgia, and 5 percent, in Tennessee.

Exports of fuller's earth were not separately shown in official statistics until 1965. In that year exports amounted to 18,575 short tons, valued at about $900,000 and were equal to less than 3 percent of domestic production by quantity. Exports of fuller's earth went to Canada and the United Kingdom and consisted principally of types used in the refining of petroleum and other oils.

U.S. imports of fuller's earth were not separately shown in official statistics until the TSUS became effective on August 31, 1963. They amounted to less than 30 long tons in both 1964 and 1965, valued at less than $2,000, and consisted of beneficiated material from the United Kingdom.

Commodity	TSUS item
Bentonite	521.61

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (1968).

U.S. trade position

The United States is a large producer of bentonite, and domestic consumption is virtually all supplied from domestic sources. Exports have increased in recent years and in 1965 were equal to 12 percent of production. Imports are negligible.

Description and uses

Bentonite is a clay formed by the weathering of volcanic ash. There are two types of this clay--the swelling type and the nonswelling type. These types differ in that the swelling type enlarges to from 15 to 20 times its volume when wetted with water, whereas the nonswelling type remains substantially inert in water. Both varieties are dried, ground, and sized before marketing.

Swelling bentonite is used chiefly as foundry sand in foundries and steel plants and as formation sealer in well-drilling muds. A more recent use of this type, and one which has grown rapidly, is as a binder in iron-ore pelletization. Lesser quantities are used for waterproofing ditches and ponds and as a carrier for insecticides and fungicides.

Nonswelling bentonite is used principally as a filtering and decolorizing agent in oil refining and in the production of acid-activated clays (see summary on item 521.87). Lesser amounts are used in foundry sands, drilling muds, animal feeds, insecticides, and fungicides.

Among the principal materials competing with bentonite are fuller's earth used in drilling muds and various organic binders used in the pelletization of iron ore. However, bentonite is usually preferred because it is more efficient in use and lower in price than any of the substitute materials.

U.S. tariff treatment 1/

The column 1 (or trade-agreement) rate of duty applicable to imports (see general headnote 3 in TSUSA (1968)) is as follows:

TSUS item	Commodity	Rate of duty
521.61	Bentonite	81.25¢ per long ton

This rate was established by the Tariff Schedules of the United States in the General Agreement on Tariffs and Trade. Before August 31, 1963, imports of bentonite were dutiable under the provisions of paragraph 207 of the Tariff Act of 1930 at the trade-agreement rates of 37.5 cents per long ton if unwrought and unmanufactured and 81.25 cents per long ton if manufactured (both rates became effective on June 6, 1951). As a rule, bentonite is not marketed in unmanufactured form, and there have been no imports of such material for over 10 years. For these reasons the two former provisions were combined in the TSUS at the rate applicable to manufactured bentonite.

Imports have been too small and too variable in grades to furnish an adequate basis for computing an ad valorem equivalent of the specific rate of duty.

U.S. consumption

Annual U.S. consumption of bentonite, virtually all supplied from domestic sources, has shown an upward trend. During 1961-65 it averaged about 1.5 million tons 2/ (see table), which was 14 percent larger than the corresponding average in the 5-year period immediately preceding. About 31 percent of the consumption of bentonite in 1961-65 was used in foundries and steelworks; 27 percent, in drilling mud; 23 percent, in pelletization of iron ore; and the remainder, in miscellaneous applications. The rise in total consumption in this period compared with that during 1956-60 reflects the increased use of this material in foundries and steel plants and in pelletization, which in the earlier period was of relatively minor importance. The increased use in these two applications more than offset the decline of about 15 percent in the use of bentonite in rotary-drilling mud in 1961-65 as compared with 1956-60.

1/ See the pertinent sections of the TSUSA (1968), reproduced in appendix A for the rate of duty resulting from the sixth round of tariff negotiations that became effective on Jan. 1, 1968.

2/ For the remainder of the summary, all tonnage figures in text are in short tons.

U.S. producers and production

Bentonite is produced in the United States by about 30 concerns operating 45 mines. Ten large, diversified concerns with 25 mines in Wyoming, Mississippi, Texas, Oklahoma, and Arizona account for over 90 percent of total annual domestic output. Most of the remainder comes from 20 firms in 9 States; some of these concerns use the output in their own integrated operations.

Annual domestic production of bentonite has increased steadily in recent years from about 1.3 million tons in 1961, valued at &15.2 million, to 1.9 million tons. valued at $20.4 million in 1965 (see table), and averaged 1.6 million tons, valued at $18.0 million, for the 5-year period.

U.S. exports and imports

Exports of bentonite were not separately shown in official statistics until 1965. Before that time the U.S. Bureau of Mines published export data obtained directly from domestic producers. These data show that before 1963 annual exports of bentonite did not exceed 60,000 tons (see table). In 1965, exports amounted to 228,000 tons, valued at $6.2 million, and were equal to 12 percent of domestic production by quantity. The increase in exports in 1965 compared with earlier years was due largely to Canada's requirements of bentonite for iron-ore pelletization, which had begun in recent years. Exports to that country in 1965 accounted for about two-thirds by quantity, but less than half by value, of total bentonite exports. The remainder of the foreign shipments went to a large number of countries, mostly to Western Europe and Australia.

Annual imports of bentonite have been negligible--less than 500 tons in most years during 1961-65. Italy has been the principal supplier; imports from that country consisted mostly of an exceptionally white bentonite suitable for pharmaceutical uses. The Italian bentonite has a much higher unit value than most of the domestic material and the ad valorem equivalent of the specific rate (81.25 cents per long ton) on such imports in 1965 was 2.1 percent. It is believed that reported imports from other countries are for the most part not bentonite.

Bentonite: U.S. production, imports for consumption, exports of domestic merchandise, and apparent domestic consumption, 1961-66

Year	Production 1/	Imports 2/	Exports	Apparent domestic consumption
	Quantity (1,000 short tons)			
1961	1,307	1	3/ 44	1,264
1962	1,444	4/	3/ 60	1,384
1963	1,585	4/	5/	5/
1964	1,730	4/	5/	5/
1965	1,888	4/	228	1,660
1966	5/	4/	303	5/
	Value (1,000 dollars)			
1961	15,224	52	5/	5/
1962	16,254	15	5/	5/
1963	18,536	8	5/	5/
1964	19,413	6	5/	5/
1965	20,407	18	6,242	14,183
1966	5/	7	8,002	5/

1/ Sold or used by producers.
2/ Quantities converted to short tons from reported long tons.
3/ As reported by the U.S. Bureau of Mines.
4/ Less than 500 tons.
5/ Not available.

Source: Production compiled from official statistics of the U.S. Bureau of Mines; imports and exports compiled from official statistics of the U.S. Department of Commerce, except as noted.

Commodity	TSUS item
Common blue clay and other ball clays:	
Not beneficiated	521.71
Wholly or partly beneficiated	521.74

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (1968).

U.S. trade position

U.S. consumption of ball clays is virtually all supplied from domestic sources. Both imports and exports are very small compared with domestic production.

Description and uses

Ball clays, including so-called "blue clay", are fine-grained, highly plastic clays consisting principally of the mineral kaolinite. They differ from kaolin in that they have a higher silica-to-alumina ratio and contain a greater proportion of mineral and organic impurities. Before being used, ball clay usually is beneficiated, i.e., ground, dried, and sized; such beneficiation is usually done by the producer but sometimes by the user.

Ball clays are usually marketed as wet, dried, or semidried lumps, or "balls". Their principal use is as an ingredient in ceramic mixtures for the manufacture of pottery and stoneware, and in floor and wall tiles. Smaller quantities are used in the production of refractories and kiln furniture (i.e., saggers and other pieces used to support ceramic ware during firing in a kiln).

The principal material competing with ball clays is kaolin.

U.S. tariff treatment 1/

The column 1 (or trade-agreement) rates of duty applicable to

1/ See the pertinent sections of TSUSA (1968), reproduced in appendix A, for the rates of duty resulting from the sixth round of tariff negotiations that became effective January 1, 1968.

imports (see general headnote 3 in TSUSA (1968)) are as follows:

TSUS item	Commodity	Rate of duty
	Common blue clay and other ball clays:	
521.71	Not beneficiated----------	62¢ per long ton
521.74	Wholly or partly beneficiated----------	$1.21 per long ton

These rates, which have been in effect since January 1, 1964, reflect concessions granted under paragraph 207 of the former schedules by the United States in the General Agreement on Tariffs and Trade.

Based on 1965 imports, the ad valorem equivalent of the specific rates of duty was 5.3 percent for unbeneficiated ball clays (521.71) and 4.2 percent for partly beneficiated ball clays (521.74).

U.S. consumption and production

U.S. consumption of ball clays approximates production as exports and imports are about equal in quantity. Annual domestic consumption and production during 1961-65 steadily increased from 445,000 tons 1/ to 591,000 tons (see table). It averaged 528,000 tons in the 5-year period, which was about one-fifth larger than the average in the corresponding period immediately preceding. Over half of the consumption in 1961-65 was used in pottery and stoneware; one-fifth, in floor and wall tiles; one-seventh, in refractories; and the remainder went into various miscellaneous applications. Consumption in all of the various uses was larger in 1961-65 than in 1956-60. The largest increase, 400 percent, occurred in the consumption of ball clays for miscellaneous uses; consumption for refractories, floor tiles, and pottery increased by about 25 percent, 16 percent, and 5 percent, respectively.

U.S. producers

Ball clays are produced in the United States by about 14 concerns. Eight of them, operating 12 mines in Tennessee, Kentucky, Mississippi, California, and Maryland, account for about 95 percent of the total domestic output.

U.S. export and imports

Exports of ball clays are not separately shown in official statistics. Available information from the trade indicates that annual

1/ All tonnage figures in text are in short tons.

Commodity	TSUS item
Other clays:	
Not beneficiated	521.81
Wholly or partly beneficiated	521.84

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (1968).

U.S. trade position

U.S. consumption of the clays covered in this summary is virtually all supplied from domestic sources. Exports greatly exceed imports, but both are very small compared with domestic production.

Description and uses

This summary covers all clays except those specifically provided for, namely kaolin or china clay (see summary on item 521.41), fuller's earth (see summary on items 521.51 and 521.54), bentonite (see summary on item 521.61), ball clays (see summary on items 521.71 and 521.74), and artificially activated clays (see summary on item 521.87).

The clays included in this summary range from low-grade, widely distributed varieties, with a value as low as $1 per ton, to high-grade, relatively scarce types, suitable for special purposes, with a value as high as $60 per ton. Most of the clays covered here are low-grade, large-tonnage varieties used locally by manufacturers of clay products, such as building bricks, paving bricks, drain tiles, and sewer pipes, and in the production of expanded lightweight aggregates and or portland and other hydraulic cements. The principal domestic clays of commerce included here are fire clays and stoneware clays. Fire clays are highly resistant to heat and are used chiefly in the manufacture of fire brick. Stoneware clays are fairly plastic clays, somewhat similar to fire clays, used in the manufacture of stoneware and other clay products, such as sewer pipes and drain tiles, where a dense body is desired. There are many other types of clays, most of which are designated by their respective principal uses, such as pencil clays, crucible clays, enamel clays, and pipe clays. Some of the clays, particularly those suitable for special purposes, are usually beneficiated (crushed to proper size, screened, and dried) before they are marketed.

To some extent, clays are interchangeable in use, especially the low-priced, large-tonnage clays used in the manufacture of bricks, cements, and lightweight aggregates.

For convenience the clays covered in this summary are hereafter referred to as other clays unless otherwise indicated.

U.S. tariff treatment 1/

The column 1 (or trade-agreement) rates of duty applicable to imports (see general headnote 3 in TSUSA (1968)) are as follows:

TSUS item	Commodity	Rate of duty
	Other clays:	
521.81	Not beneficiated	50¢ per long ton
521.84	Wholly or partly beneficiated	$1 per long ton

These rates reflect concessions granted under paragraph 207 of the former schedules by the United States in the General Agreement on Tariffs and Trade, effective October 1, 1951.

Based on the negligible imports in 1965, the ad valorem equivalent of the 50-cents-per-long-ton duty on unbeneficiated clays (item 521.81) was 1.2 percent and that of the $1-per-long-ton duty on wholly or partly beneficiated clays (item 521.84) was 1.7 percent.

U.S. consumption

Annual domestic consumption of other clays has almost steadily increased in recent years from about 42.3 million short tons in 1961 to 48.2 million short tons in 1965 (table 1) and averaged 44.7 million short tons during 1961-65. The predominant use for other clays in recent years was in the manufacture of heavy clay products--such as bricks, drain tiles, and sewer pipes--which accounted for 50 percent of total consumption. About 23 percent was used in cements; 15 percent, in lightweight aggregates; and 10 percent (all fire clay), in refractories. The remainder went into a large number of miscellaneous applications.

U.S. producers and production

One or more of the clays covered here are produced in the United States in virtually all States by several hundred companies. These concerns vary in size from large integrated operations to relatively

1/ See the pertinent sections of the TSUSA (1968), reproduced in appendix A, for the rates of duty that became effective on Jan. 1, 1968, as a result of the sixth round of tariff negotiations.

small individual enterprises.

Annual U.S. production of other clays during 1961-65 increased from about 42.5 million short tons to 48.3 million short tons (table 1) and averaged 44.9 million tons. The bulk of the output consisted of low-priced, large-tonnage clays which were not sold but were used by the producing concerns in their own operations for the manufacture of various products, principally heavy clay products. Of the total annual output in recent years, only about 8 percent was sold. For the most part, such sales consisted of specialty clays, such as slip clays, pencil clays, fire clays, and stoneware clays.

During 1961-65, production of fire and stoneware clays accounted for about one-fifth of the total output of all other clays. Nearly one-third of the fire and stoneware clays mined in this period were sold; the remainder were used by the producing concerns.

U.S. exports and imports

Exports of other clays (except fire clays) are not separately shown in official statistics. Annual exports of fire clays in the period 1961-65 fluctuated greatly. They ranged from 155,000 short tons to 264,000 short tons in quantity and from about $3.4 million to $5.6 million in value (table 1) and averaged 207,000 short tons, valued at $4.3 million. Exports have gone mostly to Canada and Mexico.

U.S. imports of other clays have been negligible compared with both domestic production and exports. They amounted to less than 1,000 short tons, valued at less than $50,000, in all years during 1961-65 and consisted of relatively high-priced specialty clays, such as Gross-Almerode clay (a German glass pot clay), crucible clays, pipe clays, and others. Germany, the United Kingdom, and Canada have been the chief suppliers (tables 2 and 3).

Table 1.--Other clays: 1/ U.S. production, imports for consumption, exports of domestic merchandise, and apparent consumption, 1961-66

Year	Production 2/	Imports 3/	Exports 4/	Apparent consumption
	Quantity (1,000 short tons)			
1961	42,478	5/	155	42,323
1962	42,457	1	188	42,270
1963	44,358	1	264	44,095
1964	46,768	1	247	46,522
1965	48,335	1	182	48,154
1966	6/	3	216	6/
	Value (1,000 dollars)			
1961	79,065	21	3,391	75,695
1962	77,074	22	3,462	73,634
1963	83,752	28	5,184	78,596
1964	88,039	28	5,596	82,471
1965	90,987	49	3,667	87,369
1966	6/	130	3,396	6/

1/ Excludes kaolin or china clay, fuller's earth, bentonite, ball clays, and artificially activated clays.

2/ Sold or used by producers.

3/ Quantities converted from reported long tons. Data for the years 1961-63 include fuller's earth, but imports of this clay are known to have been small or negligible.

4/ Exports of fire clay only. Exports of other miscellaneous clays covered by this summary are not separately reported in official statistics; they are known to be negligible compared with production.

5/ Less than 500 tons.

6/ Not available.

Source: Production, compiled from official statistics of the U.S. Bureau of Mines; imports and exports, compiled from official statistics of the U.S. Department of Commerce.

Table 2.--Other clays, not beneficiated: U.S. imports for consumption, by principal sources, 1961-66 1/

Year	West Germany	Canada	Other	Total
	Quantity (short tons) 2/			
1961	85	2	26	113
1962	131	9	22	162
1963	74	-	-	74
1964	-	39	-	39
1965	130	8	-	138
1966	217	81	-	298
	Value			
1961	$2,987	$119	$1,319	$4,425
1962	6,069	281	315	6,665
1963	3,194	-	-	3,194
1964	-	1,228	-	1,228
1965	5,035	278	-	5,313
1966	10,350	2,680	-	13,030

1/ For the years 1961-63 the import classification includes fuller's earth, but imports of this clay are known to have been small or negligible.

2/ Converted from reported long tons.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 3.--Other clays, wholly or partly beneficiated: U.S. imports for consumption, by principal sources, 1961-66 1/

Year	West Germany	Canada	United Kingdom	Other	Total
	Quantity (short tons) 2/				
1961	196	11	139	3/	346
1962	221	28	478	-	727
1963	351	100	388	-	839
1964	371	53	6	194	624
1965	425	47	372	-	844
1966	208	156	1,878	-	2,242
	Value				
1961	$13,614	$231	$2,515	$325	$16,685
1962	13,273	656	1,825	-	15,754
1963	21,763	1,836	1,649	-	25,248
1964	19,620	1,319	2,079	4,108	27,126
1965	23,164	928	19,589	-	43,681
1966	10,254	4,457	102,561	-	117,272

1/ For the years 1961-63 the import classification includes fuller's earth, but imports of this clay are known to have been small or negligible.
2/ Converted from reported long tons.
3/ Quantity not reported.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Commodity	TSUS item
Clays, artificially activated----------	521.87

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (1968).

U.S. trade position

U.S. consumption of artifically activated clay is virtually all supplied from domestic sources. Both exports and imports are small compared with domestic production.

Comment

Artificially activated clays, hereafter called simply "activated clays," are clays which have been chemically treated or activated with sulfuric acid, hydrochloric acid, or other substance to give them greatly increased absorptivity or catalytic ability. Activated clay absorbents are used to bleach or decolorize, and purify mineral, vegetable, and animal oils. Activated clay catalysts are used in the cracking of petroleum and as a desiccant to reduce moisture in closets and other closed spaces and in packaged foods such as cereals and crackers.

Activated clays compete with synthetic catalysts and with other absorbent clays, such as fuller's earth.

The column 1 (or trade-agreement) rate of duty 1/ applicable to imports (see general headnote 3 of TSUSA (1968)) is as follows:

TSUS item	Commodity	Rate of duty
521.87	Clays, artificially activated with acid or other material.	0.1¢ per lb. + 12.5% ad val.

This rate, which has been in effect since June 30, 1958, reflects a concession granted under paragraph 207 of the former schedules by the United States in the General Agreement on Tariffs and Trade. The ad valorem equivalent of the compound duty on total imports of activated clays in 1965 was 18 percent. On imports from the principal supplying countries, it was 15 percent (from West Germany) and 17 percent (from Canada).

1/ See the pertinent sections of TSUSA (1968), reproduced in appendix A, for the rate of duty resulting from the sixth round of tariff negotiations that became effective Jan. 1, 1968.

Statistics on domestic production and exports of activated clays are not separately reported. Four concerns, located in Mississippi, Louisiana, Georgia, and Utah, produce such clays, and one of these account for the bulk of the domestic output. This company derives virtually all of its revenue from the sale of activated clays, whereas the other three are integrated concerns and also market other minerals and chemicals.

Information from the trade indicates that in recent years annual U.S. production of activated clays ranged between 200,000 and 250,000 short tons and supplied virtually all domestic requirements for this material. Exports are believed to have been small, and probably were equal to less than 2 percent of domestic output.

Imports of activated clays have been very small compared with domestic production. They declined steadily from about 4,800 short tons in 1961 to 1,500 short tons in 1965 (see table) and averaged 3,400 tons annually in the 5-year period. Canada and West Germany have been the principal suppliers.

Clays, artificially activated with acid or other materials: U.S. imports for consumption, by principal sources, 1961-66

Year	Canada	West Germany	Other	Total
	Quantity (short tons) 1/			
1961	4,504	301	-	4,805
1962	4,030	293	-	4,323
1963	3,351	239	30	3,620
1964	2,463	247	16	2,726
1965	1,170	341	11	1,522
1966	828	441	-	1,269
	Value (1,000 dollars)			
1961	192	23	-	215
1962	149	23	-	172
1963	136	19	3	158
1964	100	21	3	124
1965	54	29	3	86
1966	36	38	-	74
	Unit value (per short ton)			
1961	$42.60	$76.71	-	$44.74
1962	37.01	78.61	-	39.83
1963	40.53	81.23	$96.92	43.68
1964	40.56	84.40	168.24	45.30
1965	45.77	83.78	351.02	56.47
1966	43.47	86.16	-	58.31

1/ Converted from reported pounds.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Note.--Statistics on U.S. production and exports are not separately reported. Available information indicates that the annual output ranges between 200,000 and 250,000 tons. Exports are believed to be small, but are probably larger than imports.

Commodity	TSUS item
Cryolite or kryolith----------	521.91

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (1968).

U.S. trade position

The United States depends upon imports for its requirements of natural cryolite but is virtually self-sufficient in synthetic cryolite. Exports, consisting almost entirely of synthetic cryolite, have been small.

Description and uses

This summary covers natural cryolite or kryolith and synthetic cryolite. Natural cryolite is a sodium-aluminum-fluoride mineral, but the ore as mined contains impurities which must be removed before it can be used. Natural cryolite has been found in commercial quantities only near Ivigtut, Greenland. Although that deposit has been exhausted and mining operations have been terminated, shipments continue from ore stockpiled at the mine site.

Synthetic cryolite, which is manufactured from fluorspar and sodium and aluminum salts, has substantially the same chemical composition as natural cryolite, and the two types are interchangeable for most uses.

Cryolite is used mainly in the principal commercial process for reducing aluminum oxide to aluminum metal. Other uses of cryolite are as an opacifier in enamels and glasses, as a flux material for welding-rod coating, as a grit in grinding wheels, and as a source of fluorine in insecticides. There are no satisfactory substitutes for cryolite in the production of aluminum. In its other uses cryolite competes with fluorspar and other suitable materials containing fluorine.

U.S. tariff treatment

Imports of cryolite are duty free. The duty-free treatment was provided for under paragraph 1663 of the original Tariff Act of 1930 and has been bound since July 1, 1962, in a concession granted by the United States in the General Agreement on Tariffs and Trade.

U.S. consumption

Annual U.S. consumption of cryolite rose steadily from 58,000 short tons in 1961 to 85,000 tons in 1965 (table 1) and averaged 72,000 tons for the 5-year period. The increased use of cryolite reflected primarily the rise in the domestic production of aluminum, the principal outlet for cryolite. Of the total consumption of cryolite in 1961-65, three-fourths went into aluminum, and the remainder, into abrasives, insecticides, glass, and enamel. Between 1961 and 1965, annual production of primary aluminum metal increased by about 45 percent, compared with an increase of 47 percent in the annual consumption of cryolite.

U.S. producers and production

Synthetic cryolite is produced in the United States by some of the major aluminum companies and possibly also by some chemical concerns. Virtually the entire output of the aluminum companies is used by them in their own integrated operations. Cryolite produced by chemical concerns is probably made to specifications and not for sale in the open market.

Statistics on domestic production of synthetic cryolite are not available; however, information from the trade indicates that about 50 pounds of cryolite is consumed per short ton of aluminum produced and that almost all of the synthetic cryolite is used in the production of aluminum. On the basis of this information, annual domestic output of synthetic cryolite is estimated to have increased from 44,000 tons in 1961 to 63,000 tons in 1965 (table 1). Production supplied 90 to 95 percent of the domestic consumption of synthetic cryolite in 1961-65. There is no domestic production of natural cryolite.

U.S. exports and imports

Annual exports of cryolite have been small compared with domestic production and imports. They fluctuated greatly in 1961-64 and ranged in quantity from less than 500 short tons to 4,000 short tons (table 1) and in value from $41,000 to $744,000. Exports, consisting predominantly or entirely of the synthetic product, have gone principally to Mexico and Australia. Available information indicates that the exports to Australia consisted of shipments by a domestic aluminum concern to an affiliated company.

Annual imports of cryolite remained virtually unchanged in 1964 and 1965 at 24,000 tons (table 1) and averaged 20,000 tons during 1961-65. About three-fourths of the imports in this period consisted of natural cryolite from Greenland (table 2); the remainder were synthetic cryolite, nearly all of which came from Italy.

Although imports supplied about 27 percent of total U.S. consumption of cryolite (natural and synthetic) during 1961-65, the ratio of imports to consumption for cryolite used in the production of aluminum differed greatly from that for cryolite used in other applications. Natural cryolite is necessary for the starting charge of furnaces for making aluminum; once the furnances are started, however, synthetic cryolite is used. On the other hand, in nonaluminum applications natural cryolite is used almost exclusively.

Table 1.--Cryolite: U.S. production, imports for consumption, exports of domestic merchandise, and apparent consumption, 1961-66

(In thousands of short tons)

Year	Production 1/	Imports	Exports	Apparent consumption
1961	44	14	2/	58
1962	50	12	1	61
1963	53	26	4	75
1964	58	24	3	79
1965	63	24	3/	85
1966	4/	32	3/	4/

1/ Extimated; based on an average use of 50 pounds of cryolite per ton of primary aluminum produced.
2/ Less than 500 tons.
3/ Not separately reported.
4/ Not available.

Source: Compiled from official statistics of the U.S. Department of Commerce, except as noted.

Table 2.--Cryolite: U.S. imports for consumption, by principal sources, 1961-66

Year	Italy	Greenland	Other	Total
	Quantity (1,000 short tons)			
1961	4	10	1/	14
1962	2	9	1	12
1963	5	21	1/	26
1964	6	18	1/	24
1965	5	18	1	24
1966	5	17	2/ 10	32
	Value (1,000 dollars)			
1961	709	426	59	1,194
1962	390	424	119	933
1963	955	838	15	1,808
1964	1,011	728	26	1,765
1965	1,068	793	148	2,009
1966	1,025	728	2/ 1,446	3,199

1/ Less than 500 tons.
2/ Includes 7 thousand short tons, valued at 1,153 thousand dollars, from France.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Commodity	TSUS item
Diatomite, crude or processed	522.11

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (1968).

U.S. trade position

The United States is the world's largest producer and consumer of diatomite. Exports have been equal to about 25 percent of domestic production; imports have been negligible.

Description and uses

Diatomite (also called diatomaceous earth and kieselguhr) is essentially an amorphous hydrated, or opaline, silica formed in salt water or in fresh water seas or lakes from an accumulation of minute remains of siliceous, fossil shells of microscopic plants, called diatoms. Crude diatomite usually contains impurities, such as other siliceous and nonsiliceous microscopic fossil shells, clay minerals, silica sand, and iron oxide. Although diatomite deposits of considerable size are found in many parts of the world, the most important commercially developed deposits are located in California and Nevada.

Diatomite is processed before being sold by grinding and sizing, and frequently by calcination, either with or without the use of chemical additives to improve its color or other properties.

Diatomite is used chiefly as a filtration medium for liquids and as a filler in paint, paper, plastics, and rubber. Lesser amounts are used as insulation material, absorbents, abrasives, and catalyst carriers, and in insecticides, fungicides, and the manufacture of synthetic silicates. Expanded perlite and silica sand compete with diatomite in its major use as a filtration medium; talc, ground silica sand, ground linestone, and gypsum compete with diatomite in its use as a filler.

U.S. tariff treatment

Diatomite, crude or processed, is free of duty. The duty-free treatment was provided for under paragraph 1775 of the original Tariff Act of 1930 and has been bound since January 1, 1948, in a concession granted by the United States in the General Agreement on Tariffs and Trade.

U.S. consumption

Annual domestic consumption of diatomite, virtually all of which is supplied from domestic sources, has steadily increased for a number of years, primarily because of diatomite's increased use as a filter medium and for insulation. During 1963-65, consumption amounted to about 1.4 million tons, 1/ nearly 20 percent larger than that in the preceding 3-year period (table 1). In recent years nearly half of the diatomite consumed was used as filter aids, an additional one-fourth was employed as fillers and for thermal and accoustical insulations, and the remainder went into a large number of miscellaneous applications.

U.S. producers, production, and trade

Diatomite is produced in the United States by about 14 concerns. Two of them, located in California, account for close to 90 percent of total domestic output; most of the remainder is produced by two other concerns in Nevada and Oregon. Other producing States are Washington and Arizona.

The United States is the world's largest producer of diatomite. Because of the large concentration in the domestic output of diatomite, annual production data cannot be published without revealing the operations of individual companies. The U.S. Bureau of Mines, however, regularly publishes 3-year production totals. Total domestic output in 1963-65 amounted to about 1.7 million tons (table 1), which was 20 percent larger than that in 1960-62 and almost 60 percent larger than that in the 3-year period a decade earlier.

Exports of diatomite have similarly shown an upward trend. They increased from 92,000 tons in 1960, valued at $6.5 million, to 128,000 tons in 1964, valued at $9.7 million (table 2). They declined in 1965 in quantity but not in value and amounted to 114,000 tons, valued at $9.8 million. Exports have gone to a large number of countries throughout the world; Canada, West Germany, and the United Kingdom have been the principal markets. In the period 1963-65, exports were equal to one-fourth of domestic production.

Imports of diatomite have been negligible. They were not separately shown in official trade statistics before 1964. Imports in 1964 totaled 582 tons, valued at $21,000, and in 1965 they declined to 176 tons, valued at $9,000. Canada and Mexico have been the principal suppliers.

1/ All tonnage figures in text are in short tons.

Table 1.--Diatomite, crude or processed: U.S. production, exports, and apparent consumption, 3-year totals, 1960-65

(In thousands of short tons)

Year	Production 1/	Exports	Apparent consumption
1960	1,447	92	1,151
1961		95	
1962		109	
1963	1,741	112	1,387
1964		128	
1965		114	

1/ Sold or used by producers.

Source: Production, from official statistics of the U.S. Bureau of Mines; exports, from official statistics of the U.S. Department of Commerce.

Note.--Imports, which are negligible compared with domestic production and exports, were not separately shown in official statistics before 1964. They amounted to 582 tons in 1964 and 197 tons in 1965.

Table 2.--Diatomite: U.S. exports of domestic merchandise, by principal countries of destination, 1960-66

Year	Canada	West Germany	United Kingdom	All other	Total
	Quantity (1,000 short tons)				
1960	18	13	13	48	92
1961	16	15	11	53	95
1962	23	17	13	56	109
1963	27	15	15	55	112
1964	29	16	14	69	128
1965	16	16	14	68	114
1966	29	19	17	79	144
	Value (1,000 dollars)				
1960	969	915	996	3,599	6,479
1961	991	1,051	815	3,950	6,807
1962	1,600	1,167	945	4,248	7,960
1963	1,950	1,149	1,095	4,252	8,446
1964	2,042	1,203	1,117	5,297	9,659
1965	1,925	1,218	1,153	5,456	9,752
1966	2,268	1,462	1,286	6,484	11,500

Source: Compiled from official statistics of the U.S. Department of Commerce.

Commodity	TSUS item
Fluorspar:	
Containing over 97% by weight of calcium fluoride	522.21
Containing not over 97% by weight of calcium fluoride	522.24

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (1968).

U.S. trade position

Although the United States is one of the world's largest producers of fluorspar, annual imports, in terms of quantity, have exceeded U.S. output since the mid-1950's. Imports in 1965, with a value of $20 million, were equivalent to almost 80 percent of the quantity of U.S. consumption; exports have been negligible.

Description and uses

Fluorspar, or fluorite, is a naturally-occurring crystalline nonmetallic mineral having a calcium fluoride composition. The TSUS provides separate rates of duty for fluorspar containing over 97% by weight of calcium fluoride and for fluorspar containing not over 97% by weight of calcium fluoride. This breakpoint corresponds roughly to what the trade considers to be acid grade (over 97%) and metallurgical grade (not over 97%) fluorspar; 1/ sizable quantities of the higher grade, however, are used in metallurgical and ceramic applications.

Most fluorspar ores mined in the United States must be milled to separate the mineral fluorspar (or fluorite) from the impurities and other minerals with which it is associated. Among the minerals commonly found in fluorspar ores are calcite, quartz, barite, galena, and sphalerite; some of these minerals have economic value when separated during milling, e.g., the metal sulfide minerals galena and sphalerite.

Acid grade.--About 98 percent of the acid grade fluorspar consumed in the United States is used in the manufacture of hydrofluoric acid

1/ In this summary, the term "acid grade" refers to fluorspar containing over 97% by weight of calcium fluoride; the terms "metallurgical grade" and "ceramic grade" refer to fluorspar containing not over 97% calcium fluoride.

(see summary on hydrofluoric acid, item 416.20) and its derivatives, e.g., synthetic cryolite (item 521.91). Consumer's specifications for fluorspar to be used in the manufacture of hydrofluoric acid and synthetic cryolite usually provide for a minimum content of 97 percent of calcium fluoride and a maximum content of 1.25 percent of silica; they also specify the maximum acceptable amounts of sulfide sulfur, chlorides, and other impurities that may be present, as well as particle size limitations.

Finely divided acid grade fluorspar is used as an additive in the electrolyte used in aluminum electrolysis cells. It is also used in the production of electric furnace steels, ferro-alloys, magnesium metal, welding rod coating compositions, and glass.

There is no satisfactory substitute for acid grade fluorspar for the production of hydrofluoric acid and derivatives thereof. Fluorine compounds obtained as byproducts in the processing of phosphate rock have been used but only to a minor extent.

Metallurgical and ceramic grades.--There are two distinctly different commercial products which contain not over 97 percent by weight of calcium fluoride. Metallurgical grade is in either gravel or lump form, and ceramic grade is in finely ground form. Metallurgical grade fluorspar is generally described on the basis of "effective" calcium fluoride content rather than on the actual calcium fluoride content. 1/ Most domestic material ranges from 60 to 70 percent effective calcium fluoride, whereas the imported material frequently contains over 80 percent effective calcium fluoride. Ceramic grade material usually ranges from 88 to 96 percent calcium fluoride by weight.

Metallurgical grade fluorspar is used primarily as a fluxing agent in basic open-hearth furnaces, electric furnaces, and oxygen steelmaking furnaces to thin the slag and facilitate passage of the impurities from the molten metal into the slag. In the oxygen steelmaking furnace, between 10 and 15 pounds of fluorspar are required per ton of steel produced, compared with about 8 pounds in the electric furnace and 3.3 pounds in an average open-hearth furnace. 2/ There is no satisfactory substitute for fluorspar in its major metallurgical applications.

1/ The effective calcium fluoride content is calculated by subtracting from the percentage of actual calcium fluoride content a percentage which is 2-1/2 times the percentage of silica content.

2/ Source: U.S. Bureau of Mines, Minerals Yearbook, 1964.

Ceramic grade fluorspar is used mainly in the manufacture of opaque glass and flint glass, 1/ as a flux in ferro-alloys, as an ingredient in welding rod coating compositions and white and buff colored clay bricks, and in vitreous enamels for coating household metal articles and appliances, such as refrigerators and stoves. Ceramic fluorspar is being increasingly used in the manufacture of fiber glass and disposable glass containers, and in the smelting of zinc.

Although the specifications for metallurgical grade fluorspar permit lower calcium fluoride content than those for either acid or ceramic grade fluorspar, it had not been possible to produce satisfactory metallurgical grade fluorspar from many domestic deposits because the ore could not be beneficiated economically without grinding it to smaller than gravel size. In recent years, however, finely ground ore has been successfully pelletized for use as the fluxing agent in the oxygen steelmaking furnace. The utilization of the pelletizing process will permit the use of some previously unsuitable fluorspar deposits as a source of metallurgical grade material.

U.S. tariff treatment

The column 1 (or trade-agreement) rates of duty applicable to imports (see general headnote 3 in TSUSA (1968)) are as follows:

TSUS item	Commodity	Rate of duty
	Fluorspar:	
522.21	Containing over 97% by weight of calcium fluoride.	$2.10 per long ton
522.24	Containing not over 97% by weight of calcium fluoride.	$8.40 per long ton

The rate for item 522.21 reflects a concession granted by the United States in the General Agreement on Tariffs and Trade (GATT) under paragraph 207 of the previous tariff schedules, which rate became effective on June 6, 1951. The rate for item 522.24 is that established under paragraph 207 of the Tariff Act of 1930 as originally enacted and is not a concession rate.

Based on imports in 1965, the average ad valorem equivalent of the specific rate of duty on item 522.21 was 6.8 percent; that on item 522.24 was 38.2 percent.

1/ Appreciable quantities of acid grade fluorspar are also used in the manufacture of glass and in other ceramic applications.

Through 1967, the Tariff Commission had conducted one investigation of acid grade fluorspar under the escape clause provisions and three investigations of all fluorspar under section 332 of the Tariff Act of 1930. The escape clause investigation by the Tariff Commission was completed in January 1956; on March 20, 1956, the President accepted as the Commission's finding (the Commissioners had been evenly divided in the findings) that no basis existed for granting escape clause relief. The 332 investigations were completed in June 1955, February 1960, and May 1962.

U.S. consumption

Annual U.S. apparent consumption of all grades of fluorspar combined was higher in each successive year after 1958 except for a slight decline in 1963. Annual apparent domestic consumption exceeded a million short tons for the first time in 1965 (table 1).

The U.S. Bureau of Mines canvasses all major and many lesser consumers of fluorspar for data on quantity and value of fluorspar used, grades used, and "industry" in which it is used (abbreviated here as simply "uses"). These data provide valuable information on grades and uses, and are discussed in the following sub-sections.

Acid grade.--Annual consumption of acid grade fluorspar, as reported by the Bureau of Mines, by major uses, in 1961-65 was as follows:

(In thousands of short tons)

Year	Total consumption	Consumption, by uses		
		Hydrofluoric acid	Glass and enamel	All other
1961	424	418	3	3
1962	373	366	3	4
1963	425	414	7	4
1964	458	448	7	3
1965	502	490	6	6

As the above tabulation shows, the quantity of acid grade fluorspar used annually increased substantially in the period 1961-65, reaching a record high of over a half million tons 1/ in 1965. Although there was a sizable percentage increase in 1963-65 in consump-

1/ Unless otherwise qualified, the term "tons" used hereafter in this summary means short tons.

tion in glass and enamel combined, the bulk of the increased use of acid grade fluorspar in all years was accounted for by increased use in the production of hydrofluoric acid.

The annual consumption of acid grade fluorspar in 1961-65 averaged about 436,000 tons, of which 427,000 tons was used for making hydrofluoric acid; the comparable averages for the 1956-60 period were 322,000 tons and 315,000 tons, respectively.

Plants producing hydrofluoric acid and its derivatives were located in 10 States. Except in emergencies, domestic fluorspar was used at the hydrofluoric acid plants in Illinois, Kentucky, and California, both domestic and imported fluorspar at the plant in West Virginia, and imported fluorspar only at the plants in Arkansas, Delaware, Louisiana, New Jersey, Ohio, and Texas. New facilities built recently in Louisiana and Texas use virtually no domestic fluorspar.

Metallurgical and ceramic grades.--Annual consumption of metallurgical grade fluorspar, as reported by the Bureau of Mines, by major uses, in 1961-65 was as follows:

(In thousands of short tons)

Year	Total consumption	Consumption, by uses		
		Steel furnaces	Iron foundries	All other
1961	228	205	10	13
1962	241	214	14	13
1963	272	243	17	12
1964	336	305	18	13
1965	390	355	21	14

The annual consumption of metallurgical grade fluorspar in 1961-65 averaged about 293,000 tons, of which 264,000 tons was used in steel furnaces; the comparable averages for the 1956-60 period were 239,000 tons and 218,000 tons, respectively.

Metallurgical grade fluorspar is used principally in the major steel-producing states, namely, in Alabama, California, Illinois, Indiana, Maryland, Michigan, Ohio, Pennsylvania, Texas and Utah. Requirements of the steel producer in Utah are supplied entirely by domestic fluorspar, as are part of the requirements of the steel producers in California, Indiana, and Ohio. In all of the other States named, nearly all of the fluorspar used by steel producers is imported.

Annual consumption of ceramic grade fluorspar, as reported by the Bureau of Mines, by major uses, in 1961-65 was as follows:

(In thousands of short tons)

Year	Total consumption	Consumption, by uses		
		Glass	Enamel	All other
1961	36	24	5	7
1962	38	24	5	9
1963	39	25	5	9
1964	38	24	5	9
1965	38	23	5	10

The annual consumption of ceramic grade fluorspar in 1961-65 averaged about 38,000 tons, of which 24,000 tons was used in glass: the comparable averages for the 1956-60 period were virtually identical with these.

Ceramic grade fluorspar is used to some extent in most States, but mainly in those producing glassware, such as New Jersey, New York, Ohio, Pennsylvania, West Virginia, and Illinois.

U.S. Government stockpile.--The U.S. Government began stockpiling fluorspar in 1950. Government acquisition of domestically produced acid and metallurgical grades of fluorspar was terminated in the early part of 1959; procurement of metallurgical grade fluorspar of foreign origin, however, continued until 1960 and of acid grade of foreign origin until 1963. At the end of 1966, 1,152,000 tons of acid grade and 412,000 tons of metallurgical grade fluorspar were in the Government stockpile; on that date the stockpile objectives for fluorspar were listed at 540,000 tons of acid grade, and 850,000 tons of metallurgical grade.

As a matter of policy, excess materials in the U.S. Government stockpile are disposed of in a manner that will neither disrupt the commercial market nor cause a loss to the Government. In the period 1964-67 large amounts of some materials in the stockpile were sold to domestic industry. In the case of acid grade fluorspar, however, the several public offers of relatively small tonnages attracted only limited bidding, and little if any has been disposed of in this manner. Inasmuch as less than half of the stockpile tonnage objective has been filled for metallurgical grade fluorspar, it has never been offered for sale from the stockpile.

U.S. producers

In 1965 there were 17 active fluorspar mining operations, with over 95 percent of the production coming from the operations of 6 companies. During 1965, 13 fluorspar mills and washing plants, many of them small, were in operation. Nearly 69 percent of the total output in 1965 was produced in Illinois and about 21 percent in Kentucky, with the remainder coming from Montana, Colorado, Nevada and Utah.

It is estimated that between 700 and 900 production and related workers were employed in fluorspar mines and mills at the end of 1965.

Acid grade.--In 1965 acid grade fluorspar was produced by 5 firms operating 6 flotation mills. 1/ Four of the mills were in Illinois and 1 each in Kentucky and Colorado. Three mills are operated by two small independent companies whose acid grade fluorspar operations accounted for an important part of their total sales volume; on the other hand, 3 mills were operated by subsidiaries of large, diversified firms whose fluorspar outputs accounted for only small percentages of total company operations. One of the independent firms also produced ceramic grade and metallurgical grade fluorspar.

Metallurgical and ceramic grades.--In 1965, metallurgical grade fluorspar was produced at 3 comparatively large mills, one in each of the following States: Illinois, Kentucky, and Montana. A few small and intermittent producers of this grade either shipped ore, as selectively mined, or else utilized simple washing and sizing equipment which could not be considered "mills." There was no captive production of metallurgical grade fluorspar.

The Montana firm produced metallurgical grade fluorspar only, whereas the Illinois and Kentucky firms produced both the metallurgical and ceramic grades, and the Illinois firm produced acid grade fluorspar also. The companies in Illinois and Kentucky were engaged almost wholly in the production of fluorspar and its byproducts.

U.S. production (shipments)

U.S. production (shipments) of all grades of fluorspar combined increased from an annual average of about 200,000 tons in 1961-63 to 241,000 tons in 1965 (table 1); the entire increase was accounted for by increased sale of metallurgical grade fluorspar, particularly pellets.

1/ The mill in Eagle Pass, Texas, which produces acid grade fluorspar from imported ore, is not included in the six.

Acid grade.--Domestic production (shipments) of acid grade fluorspar ranged from 122,000 to 126,000 tons, valued at about $6.5 million, annually in 1963-65 (table 2). The mills producing acid grade fluorspar in the United States have a total annual capacity well in excess of 192,000 tons, the largest tonnage ever produced in one year.

It is estimated that more than 90 percent of the total domestic output in recent years has come from the Illinois-Kentucky district. Output in Kentucky has increased moderately because the captive producer in that State has enlarged its plant and increased output by operating on a full-time basis. Output in Illinois has fluctuated considerably, due in large part to the difficulties encountered by the independent producers in that State in marketing their output. Production at the captive mill in Colorado has declined sharply largely because of decreasing requirements at the hydrofluoric acid plant in California which it supplies.

Metallurgical and ceramic grade.--Combined production (shipments) of metallurgical grade and ceramic grade fluorspar increased from a low of 65,000 tons in 1962 to 117,000 tons in 1965 (table 3); virtually this entire increase was accounted for by the sharply rising production of pelletized flotation concentrate.

The following tabulation shows production (shipments) of metallurgical grade and ceramic grade fluorspar in the period 1961-64 (in thousands of tons):

Year	Metallurgical	Ceramic
1961----------	42	34
1962----------	30	35
1963----------	32	42
1964----------	47	48

The two grades were not reported separately in 1965; in that year production of these two grades combined amounted to over 117,000 tons.

In the several years preceding 1964, most of the domestic output of metallurgical grade came from Montana; beginning with 1964, however, an increasing proportion of the production of that grade has been produced in Illinois. Probably two-thirds or more of the domestic production of ceramic grade fluorspar originates in Illinois.

U.S. exports

Data on exports of all grades of fluorspar are combined in official export statistics. It is known that most of the small exports

(table 1) consist of the ceramic grade, and that all or nearly all of the remainder are of the metallurgical grade.

U.S. imports

Domestic imports of fluorspar have shown a marked upward trend for many years, and in 1966 reached a record of 879,000 tons, 74 percent higher than in 1961 (table 1).

Acid grade.--U.S. imports of acid grade fluorspar increased from 353,000 tons in 1961 to 495,000 tons in 1965 (table 4). Inasmuch as 104,000 tons of the 1961 imports was for stockpiling, commercial imports nearly doubled in that period, rising from 249,000 tons to 495,000 tons.

During and immediately after World War II nearly all of the acid grade fluorspar used in the United States was of domestic origin. Thereafter, imports supplied an increasingly larger share of the commercial market for this grade. The approximate ratios of the tonnages of imported fluorspar used to the total quantity consumed, in specified periods, were as follows:

Period	Percent of apparent consumption supplied by imports
1946-48	15
1949-51	25
1952-56	50
1957-62	67
1963-65	75

Mexico has been by far the most important foreign supplier of acid grade fluorspar for many years; in the period 1962-65 Mexico supplied slightly more than two-thirds of total U.S. imports, in terms of quantity. In recent years Spain and Italy have furnished most of the remainder of the imports, while France, West Germany and Canada have made occasional shipments to the United States.

Imported acid grade fluorspar supplies the bulk of the material used in hydrofluoric acid and synthetic cryolite plants located on or near the eastern and gulf coasts. The availability of large quantities of acid grade fluorspar, at economical prices, from Mexico, probably was an important factor in the establishment of new hydrofluoric acid and synthetic cryolite production facilities in Texas and Louisiana.

Metallurgical and ceramic grade.--Before World War II only about 10 percent of the U.S. requirments of metallurgical grade fluorspar was imported; after the war, however, imports became increasingly important. In 1950-54 approximately 50 percent of the metallurgical grade material consumed was imported. Beginning with 1955 there was a further shift to the use of imported material. In 1958-61 about 80 percent of the annual consumption of this grade was imported, and in 1962-65 about 85 percent of domestic requirements were supplied by imports.

Imports for consumption of metallurgical grade fluorspar into the United States in 1961-65 were as follows:

	Quantity (1,000 tons)	
Year	Total	Mexico
1961----------	152	150
1962----------	205	199
1963----------	192	192
1964----------	292	280
1965----------	321	306
1966----------	349	325

As shown in the above tabulation, virtually all imports of metallurgical grade fluorspar have been supplied by Mexico. In addition to possessing inherent quality advantages over the U.S. lump metallurgical grade fluorspar, the Mexican product has a substantial advantage in delivered cost at nearly all principal points of consumption.

In the period 1962-65, approximately three-fourths of the fluorspar containing not over 97% by weight of calcium fluoride (i.e., metallurgical grade plus ceramic grade) was supplied by imports (table 3).

The United States imports little or no ceramic grade fluorspar.

Foreign production and trade

World production of fluorspar increased from about 2.2 million tons in 1960 to 3.2 million tons in 1965. The 8 principal producing countries in order of their importance as producers in 1965 were Mexico, U.S.S.R., France, Spain, China, the United States, the United Kingdom, and Italy; these countries together accounted for about 80 percent of world production of fluorspar in that year.

The highly industrialized nations are the principal consumers of fluorspar. Fluorspar consumption is expected to increase steadily with the growing production of steel, aluminum, and particularly fluorine

chemicals. Since World War II, the United States has been the most important fluorspar market of the major exporting countries (except China). Mexico exported 80 percent of its total production in 1965 to the United States; Spain 49 percent; and Italy, 33 percent.

Mexico.--Mexico advanced from an insignificant producer of fluorspar in the early 1940's to the world's largest producer in 1956, and except for 1960 has maintained that position. Because domestic demand in Mexico is still small, nearly all of its production of fluorspar is exported; most of its exports are shipped to the United States, with additional sizable tonnages going to Canada. The following tabulation shows Mexico's production and exports of fluorspar in each of the years 1961-65, insofar as data are currently available (in thousands of tons):

Year	Production	Exports	Exports to--		
			United States	Canada	All other
1961	439	457	400	48	9
1962	554	516	447	53	16
1963	531	562	476	85	1
1964	709	1/	554	1/	1/
1965	801	1/	641	1/	1/

1/ Not available.

Soviet Union.--The U.S.S.R. has increased its production of fluorspar steadily in recent years, to a record of about 385,000 tons in 1965. In addition to using virtually all of its own output, the U.S.S.R. imports substantial quantities (totaling about 120,000 tons in 1963) from China, Mongolia, and East Germany. The U.S.S.R. is probably the second largest consumer of fluorspar in the world.

France.--France has expanded its fluorspar production greatly in recent years, and now supplies most of its own needs as well as exporting fluorspar to other western European nations and to the United States. In 1965, about 276,000 tons of fluorspar were produced in France. It is expected that France will assume a more important fluorspar supplying position in western Europe as fluorspar output continues to decline in Italy and West Germany.

China.--Insofar as is known, mainland China has not increased its production of fluorspar to any considerable extent in recent years. China uses one-third to one-half of its output and exports the remainder to the U.S.S.R. and Asian countries.

The United Kingdom.--British output of fluorspar has increased sharply with the opening of new producing facilities, rising from less than 100,000 tons in each of the years 1961-63 to an estimated 190,000 tons in 1965.

Spain.--Production of fluorspar in Spain was between 160,000 and 170,000 tons in each of the years 1961-64, before increasing sharply to 245,000 tons in 1965. Spain, which has large reserves of this mineral, is the second most important supplier to the United States and also sells sizable quantities to countries in western Europe.

Italy.--Fluorspar production in Italy averaged 175,000 tons annually in 1960-62 but declined to 137,000 in 1964, before increasing to 163,000 tons in 1965. Because of the depletion of reserves in an important producing area, Italy appears to be having some difficulty in maintaining its former share of world production and exports.

Table 1.--Fluorspar: U.S. production, imports for consumption, exports of domestic merchandise, and apparent consumption, 1961-66

(Quantity in thousands of short tons; value in thousands of dollars)

Year	Production 1/	Imports 2/	Exports	Apparent consumption	Ratio (percent) of imports to apparent consumption
	Quantity				
1961	197	401	3/	598	67
1962	206	547	1	752	73
1963	200	554	1	753	74
1964	217	688	4	901	76
1965	241	816	9	1,048	78
1966	4/	879	6	4/	4/
	Value				
1961	8,940	10,506	30	19,416	54
1962	9,166	14,213	119	23,260	61
1963	9,001	14,066	157	22,910	61
1964	9,723	16,883	158	26,448	64
1965	10,889	19,958	306	30,541	65
1966	4/	21,968	301	4/	4/

1/ Shipments of finished fluorspar. There were no sales of domestic fluorspar to the U.S. Government stockpile in these years.

2/ Excludes imports entered free of duty for U.S. Government use (stockpiling), as follows:

Year	Quantity (1,000 short tons)	Value (1,000 dollars)
1961	104	3,138
1962	49	1,389
1963	1	38

3/ Less than 500 tons.

4/ Not available.

Source: Production (shipments) compiled from official statistics of the U.S. Bureau of Mines; imports and exports compiled from official statistics of the U.S. Department of Commerce.

Table 2.--Fluorspar containing over 97% by weight of calcium fluoride: U.S. production, imports for consumption, and apparent consumption, 1961-66

(Quantity in thousands of short tons; value in thousands of dollars)

Year	Production 1/	Imports 2/	Apparent consumption	Ratio (percent) of imports to apparent consumption
	Quantity			
1961	121	249	370	67
1962	141	342	483	71
1963	126	362	488	74
1964	122	396	518	76
1965	124	495	619	80
1966	3/	530	3/	3/
	Value			
1961	6,358	7,490	13,848	54
1962	6,965	10,116	17,081	59
1963	6,500	10,384	16,884	62
1964	6,356	10,887	17,243	63
1965	6,448	13,661	20,109	68
1966	3/	14,934	3/	3/

1/ Shipments of finished acid grade fluorspar.

2/ Excludes imports entered free of duty for U.S. Government use (stockpiling), as follows:

Year	Quantity (1,000 short tons)	Value (1,000 dollars)
1961	104	3,138
1962	49	1,389
1963	1	38

3/ Not available.

Source: Production (shipments) compiled from official statistics of the U.S. Bureau of Mines; imports compiled from official statistics of the U.S. Department of Commerce.

Note.--Exports are known to have been negligible during 1961-65.

Table 3.--Fluorspar containing not over 97% by weight of calcium fluoride: U.S. production, imports for consumption, exports of domestic merchandise, and apparent consumption, 1961-66

(Quantity in thousands of short tons; value in thousands of dollars)

Year	Production 1/	Imports	Exports 2/	Apparent consumption	Ratio (percent) of imports to apparent consumption
	Quantity				
1961	76	152	3/	228	67
1962	65	205	1	269	76
1963	74	192	1	265	72
1964	95	292	4	383	76
1965	117	321	9	429	75
1966	4/	349	6	4/	4/
	Value				
1961	2,582	3,016	30	5,568	54
1962	2,201	4,097	119	6,179	66
1963	2,501	3,682	157	6,026	61
1964	3,367	5,996	158	9,205	65
1965	4,441	6,297	306	10,432	60
1966	4/	7,034	301	4/	4/

1/ Shipments of finished metallurgical grade and ceramic grade fluorspar.
2/ Includes all grades.
3/ Less than 500 tons.
4/ Not available.

Source: Production (shipments) compiled from official statistics of the U.S. Bureau of Mines; imports and exports compiled from official statistics of the U.S. Department of Commerce.

Table 4.--Fluorspar containing over 97% by weight of calcium fluoride: U.S. imports for consumption, by principal sources, 1961-66

(Quantity in thousands of short tons; value in thousands of dollars)

Year	Total 1/	Mexico	Spain	Italy	All other
	Quantity				
1961	353	194	88	62	9
1962	391	248	83	48	12
1963	363	252	68	33	10
1964	396	272	85	38	1
1965	495	336	119	32	8
1966	530	357	120	53	2/
	Value				
1961	10,628	5,851	2,598	1,891	288
1962	11,505	7,364	2,310	1,435	396
1963	10,422	7,204	1,906	1,079	233
1964	10,887	7,644	2,151	1,060	32
1965	13,661	8,944	3,597	874	246
1966	14,934	9,298	4,124	1,499	13

1/ Includes imports entered free of duty for U.S. Government use (stockpiling), as follows:

	Total		Mexico		Spain		West Germany	
Year	1,000 short tons	1,000 dollars	1,000 short tons	1,000 dollars	1,000 short tons	1,000 dollars	1,000 short tons	1,000 dollars
1961	104	3,138	90	2,632	10	382	4	124
1962	49	1,389	49	1,389	-	-	-	-
1963	1	38	1	38	-	-	-	-

2/ Less than 500 tons.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Commodity	TSUS item
Natural mineral fluxes:	
Crude:	
Feldspar	522.31
Nepheline syenite	522.33
Cornwall stone	522.35
Other	522.37
Crushed or pulverized:	
Feldspar	522.41
Nepheline syenite	522.43
Other	522.45

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (1968).

U.S. trade position

Approximately three-fourths of the total U.S. needs for natural mineral fluxes, here considered, are supplied by domestically produced feldspar and one-fourth by imported nepheline syenite. The United States is on a slight export basis for feldspar, whereas the entire U.S. consumption of nepheline syenite suitable for fluxing use is supplied by imports.

Description and uses

Natural mineral fluxes are substances used to promote fusion, especially the fusion of minerals. This summary covers natural non-metallic mineral fluxes; fluorspar (items 522.21 and 522.24) is covered in a separate summary. Commercially, the most important of these fluxes are feldspar, nepheline syenite, and Cornwall stone.

Feldspars are nonmetallic alkali-aluminum silicate minerals. Nepheline syenite is a granular igneous rock which is a silicate of potassium, sodium, and aluminum similar in composition to feldspar; the nepheline syenite mineral in the United States contains too much iron to be useful as a flux. Cornwall stone is a decomposed granite containing from 50 to 75 percent of the feldspars and varying amounts of quartz, kaolin, and fluorspar. It occurs in large masses near St. Austell, in Cornwall, England, and these deposits constitute the world's only source of this material. Other less important mineral fluxes include aplite, an intrusive rock consisting almost entirely of quartz and feldspar, and alaskite, a granite composed chiefly of quartz and alkali feldspars.

Natural mineral fluxes are generally not used in crude form but almost always in the ground form. The fluxes covered by this summary are

employed predominantly in ceramic mixtures used in the manufacture of glass, pottery, china, porcelain, and tile. Other uses of these materials are in scouring soaps, as filler in foam latex products, in the manufacture of teeth for dentures, in grinding wheel compositions, and as soil conditioners.

The mineral fluxes covered herein are to a large extent interchangeable in use. The choice between them depends upon availability and price and upon the type of product to be manufactured as there are fractional differences in the chemical compositions of these materials. In addition to competing among themselves the mineral fluxes are themselves subject to competition principally from talc, pyrophyllite, and electric furnace slag, a by-product of the manufacture of elemental phosphorus.

The minerals discussed herein do not include those which are semiprecious stones (see summary covering item 520.11).

U.S. tariff treatment 1/

The column 1 (or trade-agreement) rates of duty applicable to imports (see general headnote 3 in TSUSA-1968)) are as follows:

TSUS item	Commodity	Rate of duty
	Natural mineral fluxes:	
	Crude:	
522.31	Feldspar	12.5¢ per long ton
522.33	Nepheline syenite	Free
522.35	Cornwall stone	Free
522.37	Other	Free
	Crushed, ground or pulverized:	
522.41	Feldspar	7.5% ad val.
522.43	Nepheline syenite	Free
522.45	Other	15% ad val.

The rates for items 522.31, 522.41, and 522.45 are the same as those provided for under paragraphs 207 and 214 of the former tariff schedules and reflect concessions granted by the United States in the General Agreement on Tariffs and Trade (GATT). The rates for items 522.31 and 522.41 have been in effect since June 6, 1951; the rate for item 522.45 has been in effect since January 1, 1948. The duty-free status for items 522.33, 522.35, 522.37, and 522.43 was provided for in the original Tariff Act

1/ See the pertinent sections of the TSUSA-1968, reproduced in appendix A, for the rates of duty that became effective on Jan. 1, 1968 as a result of the sixth round of tariff negotiations.

of 1930 under paragraphs 1719 and 1775 (nepheline syenite) and has been bound since January 1, 1948 in a concession granted by the United States in GATT except for the minerals as covered by item 522.37 which have not been subject to a trade agreement concession.

U.S. consumption

Consumption of the natural mineral fluxes covered in this summary reached a record high, estimated at about 890,000 tons, 1/ in 1965 (table 1). It is estimated that about 50 percent of the total tonnage of such fluxes is used in glass making, 35 percent in pottery and other non-glass ceramic wares, and the remainder in enamels and other articles. The two principal fluxes considered here--feldspar and nepheline syenite--have virtually identical uses and are in direct competition in New York State, New Jersey, Pennsylvania, Ohio, and other northeastern and midwestern States to which Canadian nepheline syenite is shipped economically. The other specially provided for natural mineral flux considered here--Cornwall stone--has very limited special uses in the manufacture of non-glass ceramic articles.

Inasmuch as virtually all crude feldspar is used in the ground form, and as only negligible quantities are lost in grinding, the available data on ground feldspar provide an accurate measure of the consumption of the crude material. Consumption of ground feldspar ranged from about 470,000 to 540,000 tons annually in the late 1950's and early 1960's. Beginning with 1963, however, consumption began a marked upward climb, reaching a total of about 664,000 tons in 1965. Ground feldspar is used, in at least small quantities, in most States; in 1965 the principal consuming States were California, Ohio, Illinois, and New Jersey in that order.

Consumption of nepheline syenite as a flux in the United States consists solely of the imports from Canada, which enter almost wholly in the ground form. Consumption increased steadily from about 63,000 tons in 1950 to 196,000 tons in 1960. In 1961-63, annual consumption was moderately lower than in 1960, but new records were set successively in 1964 and 1965, amounting in the latter year to about 217,000 tons, valued at more than $2.4 million.

Annual consumption of Cornwall stone has been very small for many years.

1/ As used in this summary, the term "tons" refers to short tons of 2,000 pounds.

U.S. producers

There are about 70 operators mining crude feldspar in the United States. The 3 largest firms account for about 67 percent of the output, the next 6 for about 24 percent, and the other 60 or so small producers for the remaining 9 percent. The principal producer of both crude and ground feldspar is a large, diversified firm which grinds its own feldspar; this firm is one of the two producers (in Canada) of nepheline syenite. Crude feldspar is the principal or only product of 7 of the 8 major producers; most of these producers are also grinders of feldspar. Nearly all of the small producers of crude feldspar sell their production to other firms for grinding.

Ground feldspar was produced commercially at 18 mills in 11 States in 1965. There were 6 grinding mills in North Carolina, 2 each in California, Connecticut, Georgia, and South Dakota, and 1 each in Arizona, Maine, South Carolina, and Virginia. The 18 mills were owned by about a dozen firms, most of which mine all or most of the crude feldspar they grind; some, however, customarily fulfill all or most of their crude feldspar requirements, by purchase, from independent miners. In addition to the 18 merchant mills, 2 or 3 producers of ceramic ware had small facilities for grinding feldspar for their own use.

In 1965, as previously, there were no U.S. producers of either nepheline syenite for fluxing use or Cornwall stone.

U.S. production

After reaching a record output, at that time, of about 627,000 tons of crude feldspar mined in 1956, production was considerably lower in each of the next 6 years before resuming its upward trend in 1963. Output attained a new record, about 700,000 tons, in 1965. 1/ North Carolina normally supplies about half of the output, followed by California and Connecticut.

Inasmuch as crude feldspar is used to make ground feldspar, the production of ground feldspar, as measured by shipments from mills, shows the same trend as production of crude feldspar. 2/ Following the production of 609,000 tons of ground feldspar in 1956, annual output was markedly lower in the period 1957-62. Thereafter, production increased in each year of the period 1963-65, reaching a record of about

1/ Included in U.S. feldspar production statistics in recent years are sizable tonnages representing the feldspar content of natural feldspar-silica sands.

2/ The output of ground feldspar is generally somewhat lower than the output of crude feldspar, mainly because of milling losses. Also, a small tonnage of crude feldspar is ground by a few firms for their own use. This captive production of ground feldspar is not reported in official statistics, whereas the crude used for its production is so reported.

664,000 tons in 1965 (table 2). Production of ground feldspar in 1965 was greatest in North Carolina, followed by California, Connecticut, Georgia, and South Carolina, in that order. The combined output of these 5 States amounted to about 90 percent of the total domestic production in 1965.

In 1965, as in previous years, there was no domestic production of either nepheline syenite suitable for fluxing use or Cornwall stone. Some high-iron nepheline syenite was produced in the United States for use as concrete aggregate and road stone; data on the output are not available.

U.S. exports

It is estimated that annual exports of ground feldspar in the period 1960-65 amounted to between 4,000 and 12,000 tons. Most of the exports of ground feldspar in those years went to Canada, Mexico, and other countries in the western hemisphere.

Little if any crude feldspar, and no nepheline syenite or Cornwall stone, was exported in 1960-65.

U.S. imports

Imports of crude feldspar, formerly sizable, have been negligible in recent years. Imports of ground feldspar--virtually all from one Canadian mill owned by a large U.S. producer of ground feldspar--declined to between about 3,000 and 4,000 tons annually in 1961-66; this decline probably is more attributable to displacement by imported nepheline syenite than to displacement by domestic feldspar. Most of the competition between domestic feldspar, imported feldspar, and imported nepheline syenite occurs in the glass and pottery producing areas of New York, New Jersey, Pennsylvania, and Ohio.

The U.S. consumption of nepheline syenite suitable as a flux has always been supplied by imports from Canada. Until 1947 most of the nepheline syenite used in the United States was imported in the crude form and ground at a mill in Rochester, New York. Thereafter, largely because of the classification of ground nepheline syenite as free of duty (T.D. 51462), the Canadian producer built a large mill at the mine. Within three years nearly all the nepheline syenite used in the United States was imported in the ground form, a situation that still prevails. In 1956 another nepheline syenite mill--owned by a U.S. firm which is a large producer of feldspar in both the United States and Canada--began producing and exporting substantial tonnages of ground nepheline syenite to the United States.

Imports of ground nepheline syenite increased steadily from about 63,000 tons in 1950 to about 196,000 tons in 1960. Annual imports were moderately smaller in 1961-63 than in 1960; however, successive new highs were established in 1964, 1965, and 1966, amounting in the latter year to about 253,000 tons (table 3).

Imports of Cornwall stone have been negligible for many years.

Table 1.--Natural mineral fluxes: U.S. production, imports for consumption, estimated consumption, and ratio (percent) of imports to estimated consumption, 1961-66

Year	Production 1/	Imports 2/	Estimated consumption 3/	Ratio (percent) of imports to estimated consumption
	Quantity (1,000 short tons)			
1961	542	190	725	26
1962	527	193	710	27
1963	599	200	785	25
1964	647	209	840	25
1965	664	240	890	27
1966	4/	282	4/	4/
	Value (1,000 dollars)			
1961	6,694	2,112	8,700	24
1962	6,703	2,178	8,700	25
1963	7,353	2,201	9,400	23
1964	7,644	2,410	9,800	25
1965	7,757	2,574	10,200	25
1966	4/	3,030	4/	4/

1/ Ground feldspar sold by merchant mills; includes the feldspar content of natural feldspar-silica mixtures. Production data not available for the other fluxes covered here.

2/ Includes crude and ground feldspar, nepheline syenite, Cornwall stone, and other natural mineral fluxes (does not include fluorspar).

3/ Rounded figures after allowing for estimated exports of ground feldspar.

4/ Not available.

Source: Production compiled from official statistics of the U.S. Bureau of Mines; imports compiled from official statistics of the U.S. Department of Commerce.

Table 2.--Feldspar, crushed, ground, or pulverized: U.S. production and imports for consumption, 1961-66

Year	Production 1/		Imports for consumption 2/	
	Quantity	Value	Quantity	Value
	1,000 short tons	1,000 dollars	1,000 short tons	1,000 dollars
1961	542	6,694	3	63
1962	527	6,703	4	87
1963	599	7,353	3	81
1964	647	7,644	3	85
1965	664	7,757	4	92
1966	3/	3/	4	86

1/ Ground feldspar sold by merchant mills; includes the feldspar content of natural feldspar-silica mixtures.
2/ Nearly all from Canada.
3/ Not available.

Source: Production compiled from official statistics of the U.S. Bureau of Mines; imports compiled from official statistics of the U.S. Department of Commerce.

Note.--Exports of ground feldspar are estimated to have ranged between 4,000 and 12,000 tons annually in the period 1961-66; hence, annual apparent consumption is believed to have been somewhat less than production in those years.

Table 3.--Nepheline syenite: U.S. imports for consumption, 1961-66

Year	Total 1/	Crude	Ground
	Quantity (1,000 short tons)		
1961	187	1	186
1962	189	2/	189
1963	197	2	195
1964	206	-	206
1965	217	2/	217
1966	253	2/	253
	Value (1,000 dollars)		
1961	2,046	20	2,026
1962	2,089	4	2,085
1963	2,114	21	2,093
1964	2,320	-	2,320
1965	2,443	1	2,442
1966	2,874	3	2,871

1/ Virtually all from Canada.
2/ Less than 500 tons.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Note.--There is no domestic production of nepheline syenite. Nepheline syenite is, however, directly competitive with domestically produced feldspar.

Commodity	TSUS item
Ice	522.51

Note.--For the statutory description see the Tariff Schedules of the United States Annotated (1968).

U.S. trade position

Domestic consumption of ice is virtually all supplied from domestic sources. Imports and exports are negligible compared with domestic production.

Comment

This summary covers natural and manufactured ice as distinct from Dry Ice, or solid carbon dioxide (see summary on item 423.00).

Ice is used for the preservation of perishable foods and the cooling of foods and liquids during and after distribution. In recent years it has also been used in concrete mixes to reduce the heat generated by lime. A concrete in which ice is used is harder, less brittle, and longer lasting.

Ice is free of duty. The duty-free status was provided for in paragraph 1696 of the original Tariff Act of 1930 and has been bound since 1948, as a concession granted by the United States in the General Agreement on Tariffs and Trade.

Annual domestic consumption of ice has declined steadily during the last decade owing to a great increase in the use of mechanical-refrigeration apparatus in commercial establishments and in households.

In 1964 ice was manufactured in the United States by about 1,750 concerns, employing approximately 7,000 workers. About half of the Nation's ice plants are located in the Southwestern, Central and South Atlantic States. The value of annual U.S. production of ice, mostly manufactured, declined from about $111 million in 1961 to $94 million in 1963 (see accompanying table). Although production statistics for later years are not available, it is believed that production has continued to decline.

U.S. exports are not separately shown in official statistics but are known to be small and believed to be accounted for mainly by border trade. Imports also represent border trade, principally from Canada, and vary considerably in volume from year to year. The value of annual imports of ice in 1961-65 never exceeded $2,700 and in most years was substantially less.

Ice: U.S. production and imports for consumption, 1961-65

Year	Domestic shipments 1/	Imports for consumption	
		Quantity	Value
		Long tons	
1961	$110,525,000	415	$2,700
1962	108,308,000	214	335
1963	94,337,000	341	1,865
1964	2/	3/	3/
1965	2/	54	794
1966	2/	3/	3/

1/ Quantity not reported.
2/ Not available.
3/ No recorded imports.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Note.--Exports are not separately reported in official statistics, but are known to be small.

Commodity	TSUS item
Magnesite:	
Crude	522.61
Caustic calcined	522.64

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (1968).

U.S. trade position

U.S. consumption of crude magnesite is virtually all supplied from domestic sources; both imports and exports are negligible. Similarly, domestic consumption of caustic calcined magnesite comes predominantly from domestic sources. In recent years, imports have accounted for about 10 percent of consumption; exports are believed to be about equal to imports in quantity.

Description and uses

Magnesite is the mineral magnesium carbonate, very little of which enters trade channels in the crude form. Virtually all of the ore is calcined (heated) by the companies that mine it to obtain magnesia products. The nature of the resulting material is determined by the temperature of the calcining process. The product of the higher temperatures is refractory magnesia (see summary on items 531.01 and 531.04), and that of the lower temperatures is caustic calcined magnesite.

Caustic calcined magnesite is used chiefly in the manufacture of oxychloride and oxysulfate cements. Smaller quantities are used in the manufacture of rubber, paper, insulation, rayon, as an admixture in fertilizers, and in the processing of chemicals and uranium. Other magnesium compounds compete with caustic calcined magnesite in some of its uses.

U.S. tariff treatment 1/

The column 1 (or trade-agreement) rates of duty applicable to

1/ See the pertinent sections of the TSUSA-1968, reproduced in appendix A, for the rates of duty that became effective on Jan. 1, 1968, as a result of the sixth round of tariff negotiations.

imports (see general headnote 3 in TSUSA (1968)) are as follows:

TSUS item	Commodity	Rate of duty
	Magnesite:	
522.61	Crude	$ 5.25 per long ton
522.64	Caustic calcined	$10.50 per long ton

These rates reflect concessions granted under paragraph 204 of the former schedules by the United States in the General Agreement on Tariffs and Trade; the rates have been effective since January 1, 1948.

Based on imports in 1965, the ad valorem equivalent of the specific rate of duty on caustic calcined magnesite was 19 percent. Imports of crude magnesite in the years 1963-65 were too small to afford a basis for the calculation of an ad valorem equivalent of the duty.

U.S. consumption

U.S. consumption of crude magnesite is virtually all supplied from domestic sources. It has been estimated that from two-thirds to three-fourths of consumption of crude magnesite is used in the manufacture of refractory magnesia; the remainder is used in the production of caustic calcined magnesite.

Annual consumption of caustic calcined magnesite during 1961-65 is believed to have been approximately equal to production, averaging about 75,000 tons. By far the largest part of domestic consumption, possibly as much as four-fifths, is used for plastic cements, and the remainder is used mostly in paper, rayon, and chemicals.

In 1961-65, imports of caustic calcined magnesite accounted for about 10 percent of the total consumed in the United States. For the most part, foreign and domestic caustic calcined magnesite do not compete in the same markets. Imports enter chiefly at east coast ports and are consumed in nearby areas in fertilizers and in the processing of magnesium chemicals. The domestic material is consumed largely in the Pacific coast area and in interior States.

U.S. producers and production

In 1965 crude magnesite was mined in the United States by four concerns in California, Nevada, and Washington. Two companies in Nevada and Washington accounted for about 95 percent of total U.S. production.

Caustic calcined magnesite is produced by six concerns in Washington, Nevada, California, Florida, and Texas. The producers in Washington and Nevada use crude magnesite as the raw material, whereas sea water is used by those in the other States. Caustic calcined magnesite is not a major source of income for any of the producers.

Domestic production of crude magnesite amounted to 528,000 short tons in 1963 (table 1), which was about equal to the annual average output in the period 1954-63. Because of the small number of companies producing crude magnesite, production data cannot be published after 1963 without revealing the operations of individual companies. It is believed that the annual output in recent years has remained at about the level of the past decade.

Annual domestic production of caustic calcined magnesite during 1961-65 averaged about 75,000 tons (table 2) and supplied about 90 percent of domestic consumption.

U.S. exports and imports

Exports of crude magnesite and caustic calcined magnesite are not separately shown in official statistics. Exports of crude magnesite are believed to be nil, largely because of the greater economy of transporting calcined magnesite. The weight of crude magnesite is about twice that of the calcined product derived from it.

Exports of caustic calcined magnesite are believed to be about equal to imports. Canada has been the principal foreign market.

Imports of crude magnesite have been negligible. In most years during 1961-65 they amounted to less than 100 short tons. Austria has been the chief, and in some years the only, supplier.

Annual imports of caustic calcined magnesite in 1961-65 ranged from 4,000 short tons, valued at $226,000, to 11,000 tons, valued at $592,000 (table 2). India has been the chief source of supply; in 1965, imports from that country accounted for about two-thirds of total imports.

Table 1.--Crude magnesite: U.S. production and imports for consumption, 1961-66

Year	Production 1/		Imports for consumption	
	Quantity	Value	Quantity	Foreign value
	1,000 short tons	1,000 dollars	1,000 short tons	1,000 dollars
1961	604	3,129	2/	2
1962	492	2,287	2	24
1963	528	1,779	-	-
1964	3/	3/	2/	4/
1965	3/	3/	2/	1
1966	3/	3/	2/	21

1/ Run-of-mine material.
2/ Less than 500 tons.
3/ Withheld to avoid disclosing operations of individual companies.
4/ Less than $500.

Source: Production compiled from official statistics of the U.S. Bureau of Mines; imports compiled from official statistics of the U.S. Department of Commerce.

Note.--Exports of crude magnesite are not shown separately in official statistics; they are believed to be nil.

Table 2.--Caustic calcined magnesite: U.S. production and imports for consumption, 1961-66

Year	Production 1/		Imports for consumption	
	Quantity	Value	Quantity	Foreign value
	1,000 short tons	1,000 dollars	1,000 short tons	1,000 dollars
1961	80	5,004	4	226
1962	63	3,857	8	395
1963	74	4,153	9	500
1964	77	5,183	8	493
1965	83	5,781	11	592
1966	2/	2/	13	743

1/ Sold.
2/ Not available.

Source: Production compiled from official statistics of the U.S. Bureau of Mines; imports compiled from official statistics of the U.S. Department of Commerce.

Note.--Exports of caustic calcined magnesite are not separately shown in official statistics; they are believed to be about equal to imports.

Commodity	TSUS item
Meerschaum, crude----------	522.71

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (1968).

U.S. trade position

The United States is dependent on imports for all of its needs of crude meerschaum.

Comment

Crude meerschaum, a hydrous magnesium silicate, is a fine-grained, white-to-yellow, opaque earthy material found in nodular masses in serpentine. It is soft when first mined, but hardens when exposed to the air. The hardened lumps are cleaned, polished, graded for soundness, color and size, and packed for shipment.

Natural block meerschaum is usually shaped into smoking pipes (see separate summary on items 756.30 and 756.35). Meerschaum dust, which is lower in quality than natural block meerschaum, is mixed with a binder and compressed, and then manufactured into smoking pipes of lower grade and into cigar and cigarette holders.

The column 1 (or trade-agreement) rate of duty 1/ applicable to imports (see general headnote 3 in TSUSA (1968)) is as follows:

TSUS item	Commodity	Rate of duty
522.71	Meerschaum, crude----------	4% ad val.

This rate, which became effective June 30, 1958, reflects a concession granted under paragraph 1552 of the former schedules, by the United States in the General Agreement on Tariffs and Trade.

Meerschaum is not produced in the United States, and domestic manufacturers of meerschaum articles depend entirely on imports for their supplies. During 1961-65, annual imports of crude meerschaum fluctuated greatly; they ranged from 19,000 pounds to 81,000 pounds, as shown in the

1/ See the pertinent sections of the TSUSA (1968) reproduced in appendix A, for the rate of duty that became effective on Jan. 1, 1968, as a result of the sixth round of tariff negotiations.

following tabulation compiled from official statistics of the Department of Commerce:

Year	Quantity (1,000 pounds)	Value (1,000 dollars)
1961---------	81	55
1962---------	69	58
1963---------	19	23
1964---------	29	37
1965---------	39	28
1966---------	14	24

Virtually all imports came from Turkey, the world's chief source of meerschaum. Meerschaum deposits also occur in Greece, Spain, France, Morocco, Tanzania, Liberia, and the Somali Republic. Commercial production outside Turkey has been reported only in Tanzania and the Somali Republic.

As far as is known, there are no exports of crude meerschaum from the United States.

Commodity	TSUS item
Mineral wool----------	522.81

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (1968).

U.S. trade position

U.S. consumption of mineral wool is virtually all supplied from domestic sources. Exports are small and imports negligible relative to domestic production.

Comment

Mineral wool is a material produced either by melting and fiberizing certain rocks or a mixture of rocks, or by fiberizing molten slag. It ordinarily consists of a mass of fine, pliant, vitreous fibers which are incombustible and do not conduct heat. Depending upon the raw material source, it is usually referred to as rock wool or slag wool.

Mineral wool is used principally as a heat and sound insulator in a large number of applications. It is marketed under various trade names and in numerous shapes, such as batts, blankets, boards, blocks, and pellets.

The column 1 (or trade-agreement) rate of duty 1/ applicable to imports (see general headnote 3 of TSUSA (1968)) is as follows:

TSUS item		Rate of duty
522.81	Mineral wool, in bulk, or in batts, blankets, or similar forms, whether or not lined, backed, or supported with paper, paperboard, or similar materials--------	15% ad val.

This rate, effective since January 1, 1948, reflects a concession granted by the United States in the General Agreement on Tariffs and Trade. Prior to August 31, 1963, mineral wool was dutiable under the provisions of paragraph 214 of the former schedules as earthy or mineral substances wholly or partly manufactured and articles, wares, and materials (crude or advanced in condition), composed wholly or in chief

1/ See the pertinent sections of TSUSA (1968), reproduced in appendix A, for the rate of duty resulting from the sixth round of tariff negotiations that became effective on Jan. 1, 1968.

value of earthy or mineral substances, not specially provided for, not decorated.

U.S. consumption of mineral wool is virtually all supplied from domestic sources. Mineral wool is produced in the United States by about 40 companies operating 75 plants located principally in Indiana, Illinois, New Jersey, Ohio, Pennsylvania, Texas, California, Michigan, and Missouri. Most of the producing concerns are diversified and manufacture a variety of articles in the field of building supplies.

Statistics on domestic production of mineral wool are not available. In the Census of Manufactures, output of mineral wool is included with that of glass wool. In 1963 the combined production of these two materials amounted to about $356 million, compared with $234 million in 1958. It is believed that more than half of each of these amounts was accounted for by mineral wool.

Exports of mineral wool are not separately shown in official statistics; they are reported under mineral insulating materials, not elsewhere classified. During 1960-65 the value of annual exports of mineral insulating materials ranged from about $8.4 million to $11.2 million. It is believed that exports of mineral wool accounted for $2 million to $4 million of the total value. Canada has been the principal foreign market.

Imports of mineral wool were not separately shown in official statistics before 1964. They were valued at about $3,000 in 1964 and $2,000 in 1965, and were all from Canada. No imports were reported in 1966.

Commodity	TSUS item
Silica	523.11

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (1968).

U.S. trade position

Although statistics on U.S. production of this material are not available, both imports and exports are known to be small relative to domestic production.

Comment

Silica occurs in the free state chiefly as quartz, one of the most abundant of all minerals. Silica is marketed in various forms, including massive quartz, ground silica, fused silica, and silica powder. Sand containing by weight 95 percent or more of silica and not more than 0.6 percent of oxide of iron, and other sand, are provided for in a separate summary covering items 513.11 and 513.14.

Silica deposits of commercial value are relatively scarce. With few exceptions, most forms of silica are sold at such low prices that factors such as proximity of deposits to railroads and to local markets largely determine the economic feasibility of exploiting the deposits.

Silica is used principally in the manufacture of pottery, paints, and scouring preparations, as a filler for wood and in rubber, as an abrasive medium, in the manufacture of fused silica articles such as laboratory and chemical ware, and in metallurgical and chemical processes. It is also used in the manufacture of ferrosilicon and silicon metal.

Imports of silica not specially provided for are free of duty. The duty-free treatment was established by the Tariff Schedules of the United States on August 31, 1963, and was bound, effective January 1, 1966, in a concession granted by the United States in the General Agreement on Tariffs and Trade. Before August 31, 1963, crude silica was provided for under paragraph 207 of the former schedules at $1.75 per long ton, and silica not specially provided for was duty-free under the provisions of paragraph 1775. Under court (C.D. 68) and administrative (T.D. 54330) rulings certain forms of silica were held to be "not crude" and entitled to free entry. The effect of these rulings was that virtually all imports of silica came under the duty-free provision for the advanced product. The TSUS recognized this condition

by combining the two former tariff provisions into one duty-free item.

Statistics on U.S. production of silica are not available. It is known, however, that domestic requirements for this material are supplied almost wholly from domestic deposits. Exports, which are not separately shown in official statistics, are believed to be small.

Annual imports of silica during 1961-65 averaged close to 22,000 short tons, valued at $108,000, virtually all of which came from Canada and Mexico (see accompanying table). It is believed that these imports consisted of short-distance shipments across the border for use by close-by industries.

Silica not specially provided for: U.S. imports for consumption, by principal sources, 1961-65

Country	1961	1962	1963	1964	1965	1966
	Quantity (short tons)					
Canada	13,052	26,720	25,178	24,325	13,824	6,234
Mexico	-	282	1,313	1,362	1,964	1,185
All other	93	29	57	6	2	1/ 91
Total	13,145	27,031	26,548	25,693	15,790	7,510
	Value					
Canada	$54,329	$106,967	$105,596	$90,115	$60,984	$46,537
Mexico	-	8,750	32,085	31,135	37,066	17,979
All other	10,001	2,338	2,155	579	288	1/ 30,930
Total	64,330	118,055	139,836	121,829	98,338	95,446

1/ Includes 24 short tons, valued at $24,224, imported from West Germany.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Note.--Statistics for U.S. production of silica are not available, but production is known to be very much larger than imports. Exports, which are not shown separately in official statistics, are believed to be small.

Commodity	TSUS item
Talc, steatite, and soapstone and articles thereof:	
Crude and not ground	523.31
Ground, washed, powdered or pulverized	523.33
Cut or sawed	523.35
Other, not specially provided for	523.37

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (1968).

U.S. trade position

The United States is the world's largest producer and consumer of talc, steatite, and soapstone. In recent years, exports, which greatly exceed imports, were equal to about 9 percent of domestic production. Imports, which supplied less than 4 percent of domestic consumption in 1964-65, consisted mostly of high-purity talcs.

Description and uses

Talc, steatite, and soapstone have similar properties but differ in impurities contained. The mineral talc is a hydrated silicate of magnesium which is white when pure but may be gray, green, brown, or red with impurities. Steatite is a pure, compact talc, and soapstone is a talcose rock that may contain as little as 50 percent talc. In the discussion that follows, the term "talcs" is used to refer to the three materials collectively.

Because of its many desirable properties, talc is one of the most widely used minerals. Among its characteristics are extreme softness, good luster, high slip or lubricating power, low moisture content, oil and grease absorption, chemical inertness, good retention for filler purposes, low electric and heat conductivity, whiteness, and good obscuring properties for pigment use. Talcs are used principally in ceramics, paints, roofing materials, rubber, insecticides, paper and toilet preparations. Lesser amounts are used in a number of miscellaneous applications.

There are considerable differences between talc deposits, resulting in different talcs with marked variations in physical and chemical properties. There are no standardized specifications for talcs; grades of talc are usually identified with their end uses. It is commercial practice to refer to talcs by grade (e.g., ceramic grade, cosmetic grade, and crayon stock). Further distinctions are made with respect

to particle shape or structure, mineral impurities, and between such physical characteristics as hardness and color.

Of particular importance is steatite talc. Steatite was originally an alternative mineralogical name usually applied to massive talcs. A soft form of steatite is called French chalk. In recent years the term steatite has been restricted to high-purity massive talc without visible grain and usually of pale yellow or cream color. It is often referred to as block steatite talc, since it is marketed in the crude state in the form of lumps and blocks. It is relatively scarce compared with other talcs and has been designated in the United States as a strategic material. Block steatite talc is valued for its high fusion point and high dielectric strength and is used for making steatite insulations. These latter articles, machined from sawed blocks, include tube spacers and electrical insulators used principally in ultrahigh frequency electronic communication equipment.

Item 523.37 ("other", not specially provided for) covers articles of talcs and consists mostly of ornamental objects carved for soapstones, such as images, book ends, and bases for lamps.

Talcs are subject to competition principally from the mineral pyrophyllite (see summary on item 523.81), a hydrous aluminum silicate which is often mined and sold as talc. It resembles talc in certain physical properties and can be substituted for talc in many applications. A phosphate-bonded ground talc is a substitute for block steatite talc. Talcs compete with kaolin, fuller's earth, and limestone in use as fillers, with feldspar in ceramics, and with ground mica in roofing. In many of the uses the choice between talcs and other materials often depends largely on price.

U.S. tariff treatment 1/

The column 1 (or trade-agreement) rates of duty applicable to imports (see general headnote 3 of TSUSA (1968)) are as follows:

TSUS item		Rate of duty
	Talc, steatite, and soapstone and articles thereof:	
523.31	Crude and not ground	0.05¢ per lb.
523.33	Ground, washed, powdered, or pulverized	12% ad val.
523.35	Cut or sawed	0.5¢ per lb.
523.37	Other, not specially provided for	24% ad val.

1/ See the pertinent sections of TSUSA-1968, reproduced in appendix A, for the rates of duty that became effective on Jan. 1, 1968, as a result of the sixth round of tariff negotiations.

The rates for items 523.31 (crude talcs) and 523.35 (cut or sawed talcs), which reflect concessions granted by the United States in the General Agreement on Tariffs and Trade (GATT), are the same as those provided for comparable articles in paragraph 209 of the former tariff schedules. The rate for the talcs in item 523.35 has been in effect since June 30, 1950, and that for the talcs in item 523.31, since July 1, 1963.

The rates for items 523.33 and 523.37 were derived from concession rates under paragraph 209. Prior to August 31, 1963, the effective date of the Tariff Schedules of the United States, ground talcs (item 523.33) and other talcs (item 523.37) were dutiable at different rates, depending upon unit value or condition, respectively. The present rate for item 523.33 is the same as the one formerly applicable to ground talcs valued at more than $14 per ton; it has been bound in the GATT, effective January 1, 1966. The rate for item 523.37 is the same as the one formerly applicable to undecorated articles; it has been bound in the GATT, effective May 1, 1966. Based on 1965 imports, the ad valorem equivalent of the specific rates of duty averaged 0.8 percent for crude talcs and 1.7 percent for cut or sawed talcs.

U.S. consumption

The United States is the world's largest consumer of talcs. Apparent annual consumption rose from about 577,000 short tons in 1961 to a high of 681,000 tons in 1964 (table 1). It declined to 654,000 tons in 1965 and averaged 633,000 tons in the 1961-65 period.

The consumption of talcs is usually related to general economic activity. Apparent average consumption during 1961-65 was about 16 percent higher than the corresponding average in the 5-year period immediately preceding. Close to 80 percent of domestic consumption in recent years was accounted for by six industries--those producing ceramics (35 percent), paints (20 percent), roofing materials (8 percent), insecticides (6 percent), paper (5 percent), and rubber (4 percent). In all major applications except in the manufacture of rubber and insecticides, consumption of talcs was higher in 1961-65 than in 1956-60. The largest increase, about 63 percent, was in paper manufacture. The use of talcs in ceramics, paints, and roofing materials rose by 19 percent, 17 percent, and 15 percent, respectively; that in rubber remained the same, whereas the use in insecticides declined by nearly 10 percent.

Because of their low price, as a rule talcs are not shipped long distances but are usually consumed within relatively short distances of the producing centers. Rather than develop standardized grades for talcs, producers convert their materials to conform to

specifications of local consuming industries. Ceramic-grade talcs are consumed principally in California, New York, and Texas; paint grades, in California and New York; and rubber and insecticide grades, in California and Arkansas.

Domestic consumption of articles of talcs approximates imports, as commercial production of such articles in the United States is known to be small.

Both ground and block steatite have been stockpiled by the U.S. Government as strategic materials. In 1960, the office of Civil and Defense Mobilization (now the Office of Emergency Planning) determined there was no longer need for stockpiling ground talc and, in 1964, established a new objective of 200 tons for block talc. The surplus material--6,285 tons of ground and 1,049 tons of block talc--was to be sold by the General Services Administration (GSA).

As of May 1967, 2,400 tons of ground talc and 1.5 tons of block talc had been sold.

U.S. producers and production

In 1965, talcs were produced in the United States by about 40 companies from 65 mines in 14 States. The leading producing States were New York, Vermont, California, and Texas. Producing concerns range in size from individuals with an intermittent annual output of less than 100 short tons to companies producing 30,000 tons and more from several deposits. Most producers operate grinding mills in conjunction with their mining operations.

The United States is the world's largest producer of talcs. Annual production (shipments) increased from about 598,000 tons in 1961, valued at $14.2 million, to a high of 732,000 tons in 1964, valued at $17.1 million (table 2). It declined in quantity to 702,000 tons in 1965 but continued to increase in value to $18 million. Production averaged 574,000 tons annually during 1961-65, valued at $16.4 million, which was 12 percent larger in quantity and 23 percent larger in value than the average in the corresponding period 1956-60. About 90 percent of the production of talcs in recent years has been marketed in ground form.

Statistics on production of articles made of talcs are not available. So far as is known, such articles are either not produced commercially in the United States or are produced in only very small quantities.

U.S. exports

During the period 1961-65, annual exports of talcs fluctuated within narrow limits. They reached a high of about 74,000 short tons in 1964 and amounted to 70,000 tons in 1965 (table 1). In terms of value these exports steadily increased from $1.8 million in 1961 to $3.5 million in 1965. In 1961-65, annual exports of talcs averaged 59,000 tons, valued at $2.7 million, and were equal in quantity to 9 percent of domestic production. Exports consisted chiefly of ceramic-and paint-grade talcs. They went to a large number of countries, principally to Mexico, Canada, and countries of western Europe (table 3). Exports of articles of talcs described in item 523.37 are not separately reported but are believed to be either nonexistent or negligible.

U.S. imports

Imports of talcs steadily declined from about 27,000 short tons in 1961, valued at $1 million, to 21,000 tons in 1965, valued at $833,000 (table 4). They averaged 24,000 tons annually in the 5-year period, valued at $1 million, and supplied about 4 percent of the total quantity of talcs consumed domestically.

Imports consisted almost entirely of talcs in ground form and came principally from Italy, France, and Canada (table 5). Most of the ground talcs, particularly those from Italy and France, are of very high purity and are used in the manufacture of toilet preparations. India has been the only regular supplier of crude talcs all of which consisted of strategic block steatite. Although in 1963 and 1964 Italy was the principal supplier of crude talcs, the material, though high-purity steatite, was not of the strategic block variety. Cut or sawed talcs were supplied almost entirely by Japan.

Annual imports of articles of talcs increased from $3,000 in 1961 to $34,000 in 1965 (table 6). In recent years, West Germany has been the chief source of such imports.

Foreign production and trade

Talcs are produced in many countries. Based on data published by the U.S. Bureau of Mines, world output in 1965 is estimated at 2.6 million tons. Of this total, the United States accounted for nearly 30 percent and the U.S.S.R., for 15 percent. Other important producing countries are France, Italy, mainland China, and India. The combined output of these four countries accounted for about 26 percent of total world production.

Table 1.--Talc, steatite, and soapstone, crude, ground or pulverized, and cut or sawed: U.S. production, imports for consumption, exports of domestic merchandise, and apparent consumption, 1961-66

(Quantity in thousands of short tons; value in thousands of dollars)

Year	Production	Imports	Exports 1/	Apparent consumption	Ratio (percent) of imports to consumption
	Quantity				
1961	597,746	27,355	48,046	577,055	4.7
1962	643,582	25,777	47,061	622,297	4.1
1963	661,292	25,462	56,590	630,165	4.0
1964	732,493	22,714	74,126	681,081	3.3
1965	702,116	21,022	69,597	653,541	3.2
1966	2/	21,890	70,377	2/	2/
	Value				
1961	14,223	1,055	1,805	13,473	7.8
1962	16,103	1,069	2,230	14,942	7.2
1963	16,757	1,078	2,778	15,056	7.2
1964	17,130	917	3,391	14,656	6.3
1965	17,970	833	3,486	15,317	5.4
1966	2/	827	3,917	2/	2/

1/ May include negligible quantities of pyrophyllite.
2/ Not available.

Source: Production compiled from official statistics of the U.S. Bureau of Mines; imports and exports compiled from official statistics of the U.S. Department of Commerce.

Note.--Statistics on domestic production of articles of talc, steatite, and soapstone are not available. Such production is believed to be very small.

Table 2.--Talc, steatite, and soapstone: U.S. production, by commercial forms, 1961-65

Year	Crude 1/	Sawed and manufactured	Ground	Total 1/
	Quantity (short tons)			
1961	65,705	695	531,346	597,746
1962	58,699	660	584,223	643,582
1963	63,924	2/	597,368	661,292
1964	73,438	2/	659,055	732,493
1965	63,345	2/	638,771	702,116
	Value (1,000 dollars)			
1961	345	407	13,471	14,223
1962	303	416	15,384	16,103
1963	313	2/	16,445	16,756
1964	371	2/	17,019	17,390
1965	255	2/	17,715	17,970

1/ May include small quantities of pyrophyllite.
2/ Included with "Ground" to avoid disclosing operations of individual companies.

Source: Compiled from official statistics of the U.S. Bureau of Mines.

Note.--Statistics on domestic production of articles of talc, steatite, and soapstone are not available. Such production is believed to be very small

Table 3.--Talc, steatite, and soapstone: U.S. exports of crude and ground material, 1/ by country, 1961-66

Country	1961	1962	1963	1964	1965	1966
	Quantity (1,000 short tons)					
Canada	17	19	25	29	30	32
Mexico	16	10	14	24	16	7
Venezuela	1	1	1	1	2	3
Sweden	2	2	2	4	5	4
United Kingdom	4	4	4	3	4	3
Netherlands	1	1	1	1	1	1
West Germany	2/	1	2	2	2	2
Philippine Republic	1	1	1	1	1	1
All other	6	8	6	9	9	17
Total	48	47	56	74	70	70
	Value (1,000 dollars)					
Canada	798	955	1,345	1,178	1,254	1,418
Mexico	329	254	329	468	427	491
Venezuela	38	64	70	86	79	124
Sweden	61	135	119	332	451	409
United Kingdom	155	157	232	177	228	260
Netherlands	36	47	35	61	65	58
West Germany	2/	117	112	123	195	153
Philippine Republic	29	40	38	36	42	53
All other	275	364	410	855	745	951
Total	1,721	2,133	2,690	3,316	3,486	3,917

1/ May include negligible quantities of pyrophylite.
2/ Included with "all other".

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 4.--Talc, steatite, and soapstone: U.S. imports for consumption, by commercial forms, and other talcs not specially provided for, 1961-66

Year	Crude	Ground	Cut or sawed	Total all commercial forms	Other talcs, n.s.p.f. 1/
	Quantity (short tons)				
1961	40	27,231	84	27,355	2/
1962	27	25,650	100	25,777	2/
1963	945	24,401	116	25,462	2/
1964	371	22,261	82	22,714	2/
1965	34	20,835	153	21,022	2/
1966	341	21,310	239	21,890	2/
	Value (1,000 dollars)				
1961	5	1,013	37	1,055	3
1962	3	1,015	51	1,069	4
1963	48	963	67	1,078	8
1964	16	855	46	917	11
1965	4	739	90	833	34
1966	8	680	139	827	7

1/ Consists of articles of talcs.
2/ Not reported.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 5.--Talc, steatite, and soapstone, crude, ground or pulverized, and cut or sawed: U.S. imports for consumption, by principal sources, 1961-66

Country	1961	1962	1963	1964	1965	1966
	Quantity (short tons)					
Italy	20,079	18,983	17,676	14,371	12,106	9,843
France	4,656	3,993	4,932	5,397	4,924	5,051
Japan	131	95	105	74	148	220
Canada	1,884	2,152	2,100	2,362	3,136	3,301
India	596	532	648	505	221	112
All other	9	22	1	5	487	3,368
Total	27,355	25,777	25,462	22,714	21,022	21,890
	Value (1,000 dollars)					
Italy	862	859	846	685	538	455
France	97	92	108	123	115	117
Japan	38	49	63	44	87	130
Canada	34	46	39	47	62	71
India	21	22	21	17	11	6
All other	3	1	1	1	20	49
Total	1,055	1,069	1,078	917	833	828

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 6.--Talc, steatite, soapstone, and other talcs not specially provided for: U.S. imports for consumption, by principal sources, 1961-66

Country	1961	1962	1963	1964	1965	1966
United Kingdom	$1,473	$662	$130	$184	-	$498
Taiwan	686	818	1,942	1,178	$957	3,335
India	28	26	4,710	-	-	-
Hong Kong	-	1,672	-	1,250	-	-
West Germany	-	-	-	7,214	26,108	-
All other	991	817	1,204	1,181	1/ 6,719	2/ 3,298
Total	3,178	3,995	7,986	11,007	33,784	7,131

1/ Includes imports valued at $5,611 from Canada.
2/ Includes imports valued at $2,326 from Canada.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Commodity	TSUS item
Zaffer	523.41

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (1968).

U.S. trade position

There is no known trade in zaffer.

Comment

Zaffer which is no longer an item of commerce, is made by roasting certain cobalt ores and mixing the powdery product with sand. It was formerly used in the manufacture of smalt, a deep-blue glass, and for imparting a cobalt-blue color to pottery and glass, but has been replaced by synthetically produced ultramarine, high-purity cobalt oxide, and other compounds far superior to zaffer for imparting blue colors to pottery and glass.

As far as is known, zaffer has not been produced anywhere in the world in the past three decades. There have been no imports for many years.

Zaffer is free of duty. The duty-free treatment, provided for in paragraph 1814 of the original Tariff Act of 1930, has not been bound in a trade agreement.

Commodity	TSUS item
Magnesium carbonate, articles of, not elsewhere enumerated----------	523.51

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (1968).

U.S. trade position

Consumption of magnesium carbonate articles is virtually all supplied from domestic sources. Exports, although small relative to domestic production, are considerably larger than imports, which are negligible.

Comment

Articles of magnesium carbonate included in item 523.51 consist of heat-insulation products, principally pipe- and boiler-covering shapes and molded blocks, produced by incorporating about 15 percent of asbestos fiber (dry weight) in a slurry of 85 percent (dry weight) of precipitated magnesium carbonate and molding, drying, and machining the mixture. Such magnesia insulation products are used primarily for thermal insulation of pipes, boilers, valves, ovens, dryers, and other industrial equipment. They compete with many other heat-insulation materials, the choice between products depending on such factors as temperatures encountered in use, efficiency, strength and other structural requirements, and comparative costs.

The column 1 (or trade-agreement) rate of duty 1/ applicable to imports (see general headnote 3 of TSUSA (1968)) is as follows:

TSUS item		Rate of duty
523.51	Magnesium carbonate, articles, not specially provided for----------	1¢ per lb.

This rate, effective since June 6, 1951, reflects a concession under paragraph 49 of the former schedule granted by the United States in the General Agreement on Tariffs and Trade. Based on imports in 1965, the ad valorem equivalent of the specific rate averaged 4.2

1/ See the pertinent sections of the TSUSA (1968), reproduced in appendix A, for the rate of duty that became effective on Jan. 1, 1968 as a result of the sixth round of tariff negotiations.

percent and was about the same for all shipments.

U.S. consumption of magnesia insulation products is approximately the same as production since both imports and exports are small. Total U.S. production of magnesia pipe and block insulation as reported by the Census of Manufacturers in specified years 1947 to 1963 was valued as follows:

Year	Million dollars
1947	11
1954	18
1958	12
1963	4

Domestic production of magnesia insulation products declined in spite of an increase in the output of industrial machinery and equipment, the manufacture of which requires insulating material. The decline reflects increased competition from bonded glass and mineral wool, and other types of industrial insulation materials.

Approximately half a dozen large and several small concerns produce magnesia insulation articles in the United States; they are located mostly in New Jersey, Pennsylvania, Illinois, and Ohio. Most of the companies also produce other types of insulation materials.

U.S. exports of magnesia insulation products, which are not separately reported in official statistics, are believed to be much larger than imports, but small compared with domestic production. Exports have gone mostly to Canada and Latin American countries.

U.S. imports of magnesia insulation products, mostly from Canada, were reported in the official statistics of the U.S. Department of Commerce as follows:

Year	1,000 pounds	1,000 dollars
1961	13	3
1962	7	3
1965	9	2

There were no imports in 1963, 1964, and 1966.

Commodity	TSUS item
Crude mineral substances not elsewhere enumerated--------	523.81

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (1968).

U.S. trade position

The United States is completely self-sufficient in crude perlite, partly self-sufficient in crude vermiculite, kyanite, lithium ores, and pyrophyllite, and entirely dependent on imports for wonderstone.

Description and uses

The mineral substances considered here are those not specially provided for elsewhere in the tariff schedules and hence do not include mineral substances provided for in schedule 4, such as witherite (items 472.02 and 472.04), barytes (items 472.10 and 472.12), chalk (item 472.20), sulphur (item 415.45), and calcium borate (item 418.12). Also excluded are metal-bearing materials provided for in part 1 of schedule 6. Among the commercially important mineral substances covered in this summary are the following:

Boron-containing minerals, including crude borax and other borates of soda, borates of lime, borates of magnesium, and miscellaneous borate minerals, used in the manufacture of various boron compounds (items 416.10, 420.76, 420.78, and 423.00);

The aluminum silicate minerals kyanite, sillimanite, andalusite, and dumortierite used to produce mullite (item 523.91), a highly refractory material;

Lithium minerals used in ceramic batches and for the production of lithium metal (item 415.30) and lithium compounds (item 419.10);

Vermiculite, a micaceous mineral which, after expansion or exfoliation by the application of heat, is used as heat and sound insulation and as a lightweight aggregate in concrete and plaster;

Pyrophyllite, a talc-like mineral used chiefly in ceramic products such as ceramic wall tiles and refractories, and in insecticides;

Wonderstone, a massive block pyrophyllite used in the manufacture of electrical insulators and for lining crucibles and reaction chambers;

Perlite, a volcanic glass which, after expansion by heat, is used as a lightweight aggregate in plasters, mortars, and concretes;

Natural pebbles used in aquariums, fish ponds, and for the edging of paths; and

Wollastonite, a calcium silicate mineral used mainly in ceramic batches.

The above-named minerals or substances are indicative of some of the articles provided for under this basket provision of the tariff schedules; it is not by any means an all-inclusive list.

U.S. tariff treatment

Crude mineral substances not speciallly provided for are free of duty under item 523.81 of the TSUSA-1968. The duty-free status was provided for in paragraphs 1633 and 1719 of the Tariff Act of 1930 and has not been bound.

U.S. consumption, production, and trade

The total value of consumption of minerals known to be covered by item 523.81 amounted to probably more than $10 million annually in the years 1961-65; it is estimated that less than one-fourth of that value was supplied by imports. In the same period, exports, consisting mainly of kyanite, vermiculite, and perlite, are known to have been considerably smaller than combined imports of all the products here considered.

The total value of imports under item 523.81 in the only 3 years for which such data are available was as follows: 1964, $2.3 million; 1965, $2.0 million; 1966, $2.4 million.

The following paragraphs show the approximate annual consumption, production, imports, and exports (mostly estimates based on various sources) of a number of the crude minerals and mineral substances covered by item 523.81. Quantities are given in terms of short tons (2,000 pounds).

Kyanite minerals.--For 1965, annual consumption is estimated at 60,000 tons; domestic production, at 60,000 tons; and exports, at 4,000 tons. Imports, mainly from India, were about 4,000 tons in 1965 (see table). Two important producers operate mines and mills in Virginia and South Carolina, and a third producer operates on a limited scale in Georgia. Domestic kyanite encounters greater competition from domestic and imported mullite (item 523.91) than it does from imported kyanite.

Lithium minerals (or ores).--Consumption cannot be determined. Data on domestic production are classified as secret and hence are not published; exports are negligible. Imports averaged about 29,000 tons

annually in 1962-64, but declined to about 13,000 tons in 1965 and 9,000 tons in 1966 (see table). Three major producers operate mines and mills in North Carolina and California; one of these producers is also the principal importer.

Vermiculite.--Annual consumption amounts to about 230,000 tons; domestic production, to 225,000 tons; exports, to 10,000 tons; imports, to 15,000 tons. One major domestic producer operates mines and mills in Montana and South Carolina.

Wonderstone.--Annual consumption is about 1,000 tons; domestic production and exports are nil; imports are estimated at 1,000 tons annually.

Pyrophyllite.--Annual consumption amounts to about 150,000 tons; domestic production, to 130,000 tons; exports are negligible; imports are estimated at 20,000 tons annually. About 10 small producers operate mines in California and North Carolina.

Perlite.--Annual consumption totals about 380,000 tons; domestic production, 390,000 tons; exports, 10,000 tons; imports are nil. Sixteen small-to-large companies operate 17 mines in New Mexico, California, Arizona, Nevada, Colorado, Idaho, and Utah.

Anhydrite.--Annual consumption is about 100,000 tons, all supplied by imports. Commercial domestic production and exports are nil.

Natural pebbles.--The value of annual consumption is about $5,000. Commercial domestic production and exports are nil. The value of imports is estimated at $5,000 annually.

Mineral specimens.--Annual consumption cannot be determined. Domestic production is probably many times as large as imports, which are valued at approximately $25,000 annually. Export data are not available.

"Holy earth" and holy water".--The value of annual consumption is about $2,000. Domestic production and exports are nil. Invoice analysis indicates that annual imports, all from Israel, are valued at $2,000.

Sea water.--Total value is nominal. Most sea water samples are analyzed by same company or Government agency that takes them. There are probably no commercial sales.

Wollastonite.--Annual consumption is known to be increasing steadily, but data on tonnage are not available. Exports amount to several hundred tons annually. There are no known commercial imports. One firm in New York State accounts for the bulk of the domestic output,

and there are several small companies in California producing intermittently.

Crude mineral substances not elsewhere enumerated:
U.S. imports for consumption, 1961-66

Year	Kyanite minerals	Lithium ores	Other
	Quantity (1,000 short tons)		
1961	5	27	1/
1962	5	31	1/
1963	3	2/ 27	1/
1964	2	2/ 27	1/
1965	4	2/ 13	1/
1966	3	9	1/
	Foreign value (1,000 dollars)		
1961	244	777	1/
1962	234	1,006	1/
1963	119	2/ 820	1/
1964	104	2/ 852	1,830
1965	167	2/ 430	1,515
1966	141	259	2,007

1/ Not available.
2/ Revised from published data on the basis of analysis of invoice documents.

Source: Compiled from official statistics of the U.S. Department of Commerce, except as noted.

Commodity	TSUS item
Mineral substances, other than crude, and articles thereof, not elsewhere enumerated:	
Not decorated	523.91
Decorated	523.94

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (1968).

U.S. trade position

The United States is a large producer of the substances and articles covered herein. Although no statistics are available production is known to be many times larger than imports and exports are believed to exceed imports.

Comment

These TSUS items cover a wide variety of mineral substances other than crude, and ornamental and utilitarian articles, decorated and not decorated, made of mineral substances. The term "decorated", as it relates to the articles considered here, includes in part glazing and coloring as well as molding and carving into shapes.

In recent years, a substantial part of total imports of undecorated articles has consisted of various catalysts, alabasterite figures, and zircon flour used in foundries as a mold or core wash. Other products include burnt clay, for use in surfacing tennis courts; expanded clay and shale and blast furnace slag, for use as aggregates; asphalt shingles and other asphalt products; bricks that have been only sun-dried, or fired at too low a temperature to qualify as ceramic articles; mullite, an aluminum silicate of excellent refractory properties; manufactures of silicon carbide; boxed and identified mineral specimens; fused basalt shapes; ground and sized pyrophyllite; exfoliated vermiculite; and ground and sized natural pozzolan.

Among the decorated articles imported in recent years are some alabasterite figures and objects; glazed bricks and tiles, fired at too low a temperature to qualify as ceramic articles; lacquered seashells; and colored stones for use in aquariums.

MANUFACTURES OF MINERAL SUBSTANCES, NOT ELSEWHERE ENUMERATED

The column 1 (or trade-agreement) rates of duty 1/ applicable to imports (see general headnote 3 in TSUSA-1968)) are as follows:

TSUS item	Commodity	Rate of duty (percent ad valorem)
	Mineral substances, other than crude, and articles thereof, not elsewhere enumerated:	
523.91	Not decorated----------	15
523.94	Decorated----------	27

The rates are the same as those imposed under paragraph 214 of the former tariff schedules and reflect concessions granted by the United States in the General Agreement on Tariffs and Trade. The rate applying to "not decorated" articles became effective on January 1, 1948, and that applying to "decorated" articles on July 1, 1963.

There is substantial production in the United States of the products covered by this summary, although official statistics are available only for synthetic mullite. In 1965, 9 concerns, located in Georgia, New York, Alabama, Connecticut, Pennsylvania, Kentucky, and Tennessee, produced synthetic (fused) mullite. The following tabulation shows the domestic production of synthetic mullite for the years 1961-65, as reported by the U.S. Bureau of Mines:

Year	Quantity (short tons)	Value (1,000 dollars)
1961---------	14,798	1,720
1962---------	19,021	2,090
1963---------	29,588	3,529
1964---------	36,108	4,450
1965---------	40,049	4,866

In addition to fused mullite, substantial amounts of mullite are regularly produced domestically from kyanite; data on such output cannot be published as it would reveal operations of individual companies. Mullite has been stockpiled by the U.S. Government as a strategic material. As of June 30, 1967, the national stockpile amounted to 6,244 short tons compared with a stockpile objective for mullite and kyanite (part of item 523.81) combined of 4,800 tons.

1/ See the pertinent sections of the TSUSA-1968, reproduced in appendix A, for the rates of duty that became effective on Jan. 1, 1968 as a result of the sixth round of tariff negotiations.

Exports of the products covered by this summary are not separately shown in official statistics. Such exports are believed to be much larger than imports.

Official statistics on imports of the products covered herein have been published only since 1964. Annual imports amounted to about $2 million in 1964 and 1965 and nearly doubled in 1966 (see table below). Imports consisted almost entirely of undecorated articles. Sweden, Canada, and West Germany were the principal suppliers of such manufactures whereas Italy was the dominant source of decorated articles. Many of the undecorated articles are imported sporadically and, with some exceptions, they generally compete only to a limited extent with domestically produced articles.

Mineral substances other than crude and manufactures of mineral substances, not elsewhere enumerated: U.S. imports for consumption, by principal sources, 1964-66

(In 1,000 dollars)

Country	1964		1965		1966	
	Not decorated	Decorated	Not decorated	Decorated	Not decorated	Decorated
Sweden	151	-	345	-	1,464	-
Canada	296	1/	376	-	661	-
West Germany	360	-	180	-	435	2
Norway	699	-	-	-	250	-
United Kingdom	229	2	141	2	230	1
Japan	158	2	143	10	161	7
Italy	129	77	169	385	111	135
All other	83	15	276	30	313	22
Total	2,105	96	1,630	427	3,625	167

1/ Less than $500.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Note.--Data on domestic production and exports are not available. Domestic production is known to be many times larger than imports, and exports are believed to exceed imports.

A P P E N D I X E S

APPENDIX A

TARIFF SCHEDULES OF THE UNITED STATES ANNOTATED

GENERAL HEADNOTES AND RULES OF INTERPRETATION

1. Tariff Treatment of Imported Articles. All articles imported into the customs territory of the United States from outside thereof are subject to duty or exempt therefrom as prescribed in general headnote 3.

2. Customs Territory of the United States. The term "customs territory of the United States", as used in the schedules, includes only the States, the District of Columbia, and Puerto Rico.

3. Rates of Duty. The rates of duty in the "Rates of Duty" columns numbered 1 and 2 of the schedules apply to articles imported into the customs territory of the United States as hereinafter provided in this headnote:

(a) Products of Insular Possessions.

(i) Except as provided in headnote 6 of schedule 7, part 2, subpart E, [and] except as provided in headnote 4 of schedule 7, part 7, subpart A, articles imported from insular possessions of the United States which are outside the customs territory of the United States are subject to the rates of duty set forth in column numbered 1 of the schedules, except that all such articles the growth or product of any such possession, or manufactured or produced in any such possession from materials the growth, product, or manufacture of any such possession or of the customs territory of the United States, or of both, which do not contain foreign materials to the value of more than 50 percent of their total value, coming to the customs territory of the United States directly from any such possession, and all articles previously imported into the customs territory of the United States with payment of all applicable duties and taxes imposed upon or by reason of importation which were shipped from the United States, without remission, refund, or drawback of such duties or taxes, directly to the possession from which they are being returned by direct shipment, are exempt from duty.

(ii) In determining whether an article produced or manufactured in any such insular possession contains foreign materials to the value of more than 50 percent, no material shall be considered foreign which, at the time such article is entered, may be imported into the customs territory from a foreign country, other than Cuba or the Philippine Republic, and entered free of duty.

(b) Products of Cuba. Products of Cuba imported into the customs territory of the United States, whether imported directly or indirectly, are subject to the rates of duty set forth in column numbered 1 of the schedules. Preferential rates of duty for such products apply only as shown in the said column 1. 1/

(c) Products of the Philippine Republic.

(i) Products of the Philippine Republic imported into the customs territory of the United States, whether imported directly or indirectly, are subject to the rates of duty which are set forth in column numbered 1 of the schedules or to fractional parts of the rates in the said column 1, as hereinafter prescribed in subdivisions (c)(ii) and (c)(iii) of this headnote.

(ii) Except as otherwise prescribed in the schedules, a Philippine article, as defined in subdivision (c)(iv) of this headnote, imported into the customs territory of the United States and entered on or before July 3, 1974, is subject to that rate which results from the application of the following percentages to the most favorable rate of duty (i.e., including a preferential rate prescribed for any product of Cuba) set forth in column numbered 1 of the schedules:

(A) 20 percent, during calendar years 1963 through 1964,

(B) 40 percent, during calendar years 1965 through 1967,

(C) 60 percent, during calendar years 1968 through 1970,

(D) 80 percent, during calendar years 1971 through 1973,

(E) 100 percent, during the period from January 1, 1974, through July 3, 1974.

(iii) Except as otherwise prescribed in the schedules, products of the Philippine Republic, other than Philippine articles, are subject to the rates of duty (except any preferential rates prescribed for products of Cuba) set forth in column numbered 1 of the schedules.

(iv) The term "Philippine article", as used in the schedules, means an article which is the product of the Philippines, but does not include any article produced with the use of materials imported into the Philippines which are products of any foreign country (except materials produced within the customs territory of the United States) if the aggregate value of such imported materials when landed at the Philippine port of entry, exclusive of any landing cost and Philippine duty, was more than 20 percent of the appraised customs value of the article imported into the customs territory of the United States.

(d) Products of Canada.

(i) Products of Canada imported into the customs territory of the United States, whether imported directly or indirectly, are subject to the rates of duty set forth in column numbered 1 of the schedules. The rates of duty for a Canadian article, as defined in subdivision (d)(ii) of this headnote, apply only as shown in the said column numbered 1.

(ii) The term "Canadian article", as used in the schedules, means an article which is the product of Canada, but does not include any article produced with the use of materials imported into Canada which are products of any foreign country (except materials produced within the customs territory of the United States), if the aggregate value of such imported materials when landed at the Canadian port of entry (that is, the actual purchase price, or if not purchased, the export value, of such materials, plus, if not included therein, the cost of transporting such materials to Canada but exclusive of any landing cost and Canadian duty) was --

(A) with regard to any motor vehicle or automobile truck tractor entered on or before December 31, 1967, more than 60 percent of the appraised value of the article imported into the customs territory of the United States; and

(B) with regard to any other article (including any motor vehicle or automobile truck tractor entered after December 31, 1967), more than 50 percent of the appraised value of the article imported into the customs territory of the United States.

1/ By virtue of section 401 of the Tariff Classification Act of 1962, the application to products of Cuba of either a preferential or other reduced rate of duty in column 1 is suspended. See general headnote 3(e), infra. The provisions for preferential Cuban rates continue to be reflected in the schedules because, under section 401, the rates therefor in column 1 still form the bases for determining the rates of duty applicable to certain products, including "Philippine articles".

General Headnotes and Rules of Interpretation

(e) Products of Communist Countries. Notwithstanding any of the foregoing provisions of this headnote, the rates of duty shown in column numbered 2 shall apply to products, whether imported directly or indirectly, of the following countries and areas pursuant to section 401 of the Tariff Classification Act of 1962, to section 231 or 257(e)(2) of the Trade Expansion Act of 1962, or to action taken by the President thereunder:

Albania
Bulgaria
China (any part of which may be under Communist domination or control)
Cuba 1/
Czechoslovakia
Estonia
Germany (the Soviet zone and the Soviet sector of Berlin)
Hungary
Indochina (any part of Cambodia, Laos, or Vietnam which may be under Communist domination or control)
Korea (any part of which may be under Communist domination or control)
Kurile Islands
Latvia
Lithuania
Outer Mongolia
Rumania
Southern Sakhalin
Tanna Tuva
Tibet
Union of Soviet Socialist Republics and the area in East Prussia under the provisional administration of the Union of Soviet Socialist Republics.

(f) Products of All Other Countries. Products of all countries not previously mentioned in this headnote imported into the customs territory of the United States are subject to the rates of duty set forth in column numbered 1 of the schedules.

(g) Effective Date; Exceptions - Staged Rates of Duty. Except as specified below or as may be specified elsewhere, pursuant to section 501(a) of the Tariff Classification Act of 1962 (P.L. 87-456, approved May 24, 1962), the rates of duty in columns numbered 1 and 2 become effective with respect to articles entered on or after the 10th day following the date of the President's proclamation provided for in section 102 of the said Act. If, in column numbered 1, any rate of duty or part thereof is set forth in parenthesis, the effective date shall be governed as follows:

(i) If the rate in column numbered 1 has only one part (i.e., 8¢ (10¢) per lb.), the parenthetical rate (viz., 10¢ per lb.) shall be effective as to articles entered before July 1, 1964, and the other rate (viz., 8¢ per lb.) shall be effective as to articles entered on or after July 1, 1964.

(ii) If the rate in column numbered 1 has two or more parts (i.e., 5¢ per lb. + 50% ad val.) and has a parenthetical rate for either or both parts, each part of the rate shall be governed as if it were a one-part rate. For example, if a rate is expressed as "4¢ (4.5¢) per lb. + 8% (9%) ad val.", the rate applicable to articles entered before July 1, 1964, would be "4.5¢ per lb. + 9% ad val."; the rate applicable to articles entered on or after July 1, 1964, would be "4¢ per lb. + 8% ad val.".

(iii) If the rate in column numbered 1 is marked with an asterisk (*), the foregoing provisions of (i) and (ii) shall apply except that "January 1, 1964" shall be substituted for "July 1, 1964", wherever this latter date appears.

1/ In Proclamation 3447, dated February 3, 1962, the President, acting under authority of section 620(a) of the Foreign Assistance Act of 1961 (75 Stat. 445), as amended, prohibited the importation into the United States of all goods of Cuban origin and all goods imported from or through Cuba, subject to such exceptions as the Secretary of the Treasury determines to be consistent with the effective operation of the embargo.

4. Modification or Amendment of Rates of Duty. Except as otherwise provided in the Appendix to the Tariff Schedules --

(a) a statutory rate of duty supersedes and terminates the existing rates of duty in both column numbered 1 and column numbered 2 unless otherwise specified in the amending statute;

(b) a rate of duty proclaimed pursuant to a concession granted in a trade agreement shall be reflected in column numbered 1 and, if higher than the then existing rate in column numbered 2, also in the latter column, and shall supersede but not terminate the then existing rate (or rates) in such column (or columns);

(c) a rate of duty proclaimed pursuant to section 336 of the Tariff Act of 1930 shall be reflected in both column numbered 1 and column numbered 2 and shall supersede but not terminate the then existing rates in such columns; and

(d) whenever a proclaimed rate is terminated or suspended, the rate shall revert, unless otherwise provided, to the next intervening proclaimed rate previously superseded but not terminated or, if none, to the statutory rate.

5. Intangibles. For the purposes of headnote 1 --

(a) corpses, together with their coffins and accompanying flowers,
(b) currency (metal or paper) in current circulation in any country and imported for monetary purposes,
(c) electricity,
(d) securities and similar evidences of value, and
(e) vessels which are not "yachts or pleasure boats" within the purview of subpart D, part 6, of schedule 6,

are not articles subject to the provisions of these schedules.

6. Containers or Holders for Imported Merchandise. For the purposes of the tariff schedules, containers or holders are subject to tariff treatment as follows:

(a) Imported Empty: Containers or holders if imported empty are subject to tariff treatment as imported articles and as such are subject to duty unless they are within the purview of a provision which specifically exempts them from duty.

(b) Not Imported Empty: Containers or holders if imported containing or holding articles are subject to tariff treatment as follows:

(i) The usual or ordinary types of shipping or transportation containers or holders, if not designed for, or capable of, reuse, and containers of usual types ordinarily sold at retail with their contents, are not subject to treatment as imported articles. Their cost, however, is, under section 402 or section 402a of the tariff act, a part of the value of their contents and if their contents are subject to an ad valorem rate of duty such containers or holders are, in effect, dutiable at the same rate as their contents, except that their cost is deductible from dutiable value upon submission of satisfactory proof that they are products of the United States which are being returned without having been advanced in value or improved in condition by any means while abroad.

(ii) The usual or ordinary types of shipping or transportation containers or holders, if designed for, or capable of, reuse, are subject to treatment as imported articles separate and distinct from their contents. Such holders or containers are not part of the dutiable value of their contents and are separately subject to duty upon each and every importation into the customs territory of the United States unless within the scope of a provision specifically exempting them from duty.

(iii) In the absence of context which requires otherwise, all other containers or holders are subject to the same treatment as specified in (ii) above for usual or ordinary types of shipping or transportation containers or holders designed for, or capable of, reuse.

7. Commingling of Articles. (a) Whenever articles subject to different rates of duty are so packed together or mingled that the quantity or value of each class of articles cannot be readily ascertained by customs officers (without physical segregation of the shipment or the contents of any entire package thereof), by one or more of the following means:

(i) sampling,

(ii) verification of packing lists or other documents filed at the time of entry, or

(iii) evidence showing performance of commercial settlement tests generally accepted in the trade and filed in such time and manner as may be prescribed by regulations of the Secretary of the Treasury,

the commingled articles shall be subject to the highest rate of duty applicable to any part thereof unless the consignee or his agent segregates the articles pursuant to subdivision (b) hereof.

(b) Every segregation of articles made pursuant to this headnote shall be accomplished by the consignee or his agent at the risk and expense of the consignee within 30 days (unless the Secretary authorizes in writing a longer time) after the date of personal delivery or mailing, by such employee as the Secretary of the Treasury shall designate, of written notice to the consignee that the articles are commingled and that the quantity or value of each class of articles cannot be readily ascertained by customs officers. Every such segregation shall be accomplished under customs supervision, and the compensation and expenses of the supervising customs officers shall be reimbursed to the Government by the consignee under such regulations as the Secretary of the Treasury may prescribe.

(c) The foregoing provisions of this headnote do not apply with respect to any part of a shipment if the consignee or his agent furnishes, in such time and manner as may be prescribed by regulations of the Secretary of the Treasury, satisfactory proof --

(i) that such part (A) is commercially negligible, (B) is not capable of segregation without excessive cost, and (C) will not be segregated prior to its use in a manufacturing process or otherwise, and

(ii) that the commingling was not intended to avoid the payment of lawful duties.

Any article with respect to which such proof is furnished shall be considered for all customs purposes as a part of the article, subject to the next lower rate of duty, with which it is commingled.

(d) The foregoing provisions of this headnote do not apply with respect to any shipment if the consignee or his agent shall furnish, in such time and manner as may be prescribed by regulations of the Secretary of the Treasury, satisfactory proof --

(i) that the value of the commingled articles is less than the aggregate value would be if the shipment were segregated;

(ii) that the shipment is not capable of segregation without excessive cost and will not be segregated prior to its use in a manufacturing process or otherwise; and

(iii) that the commingling was not intended to avoid the payment of lawful duties.

Any merchandise with respect to which such proof is furnished shall be considered for all customs purposes to be dutiable at the rate applicable to the material present in greater quantity than any other material.

(e) The provisions of this headnote shall apply only in cases where the schedules do not expressly provide a particular tariff treatment for commingled articles.

8. Abbreviations. In the schedules the following symbols and abbreviations are used with the meanings respectively indicated below:

$	-	dollars
¢	-	cents
%	-	percent
+	-	plus
ad val.	-	ad valorem
bu.	-	bushel
cu.	-	cubic
doz.	-	dozen
ft.	-	feet
gal.	-	gallon
in.	-	inches
lb.	-	pounds
oz.	-	ounces
sq.	-	square
wt.	-	weight
yd.	-	yard
pcs.	-	pieces
prs.	-	pairs
lin.	-	linear
I.R.C.	-	Internal Revenue Code

9. Definitions. For the purposes of the schedules, unless the context otherwise requires --

(a) the term "entered" means entered, or withdrawn from warehouse, for consumption in the customs territory of the United States;

(b) the term "entered for consumption" does not include withdrawals from warehouse for consumption;

(c) the term "withdrawn for consumption" means withdrawn from warehouse for consumption and does not include articles entered for consumption;

(d) the term "rate of duty" includes a free rate of duty; rates of duty proclaimed by the President shall be referred to as "proclaimed" rates of duty; rates of duty enacted by the Congress shall be referred to as "statutory" rates of duty; and the rates of duty in column numbered 2 at the time the schedules become effective shall be referred to as "original statutory" rates of duty;

(e) the term "ton" means 2,240 pounds, and the term "short ton" means 2,000 pounds;

(f) the terms "of", "wholly of", "almost wholly of", "in part of" and "containing", when used between the description of an article and a material (e.g., "furniture of wood", "woven fabrics, wholly of cotton", etc.), have the following meanings;

(i) "of" means that the article is wholly or in chief value of the named material;

(ii) "wholly of" means that the article is, except for negligible or insignificant quantities of some other material or materials, composed completely of the named material;

(iii) "almost wholly of" means that the essential character of the article is imparted by the named material, notwithstanding the fact that significant quantities of some other material or materials may be present; and

(iv) "in part of" or "containing" mean that the article contains a significant quantity of the named material.

With regard to the application of the quantitative concepts specified in subparagraphs (ii) and (iv) above, it is intended that the de minimis rule apply.

APPENDIX A

General Headnotes and Rules of Interpretation

10. General Interpretative Rules. For the purposes of these schedules --

(a) the general, schedule, part, and subpart headnotes, and the provisions describing the classes of imported articles and specifying the rates of duty or other import restrictions to be imposed thereon are subject to the rules of interpretation set forth herein and to such other rules of statutory interpretation, not inconsistent therewith, as have been or may be developed under administrative or judicial rulings;

(b) the titles of the various schedules, parts, and subparts and the footnotes therein are intended for convenience in reference only and have no legal or interpretative significance;

(c) an imported article which is described in two or more provisions of the schedules is classifiable in the provision which most specifically describes it; but, in applying this rule of interpretation, the following considerations shall govern:

(i) a superior heading cannot be enlarged by inferior headings indented under it but can be limited thereby;

(ii) comparisons are to be made only between provisions of coordinate or equal status, i.e., between the primary or main superior headings of the schedules or between coordinate inferior headings which are subordinate to the same superior heading;

(d) if two or more tariff descriptions are equally applicable to an article, such article shall be subject to duty under the description for which the original statutory rate is highest, and, should the highest original statutory rate be applicable to two or more of such descriptions, the article shall be subject to duty under that one of such descriptions which first appears in the schedules;

(e) in the absence of special language or context which otherwise requires --

(i) a tariff classification controlled by use (other than actual use) is to be determined in accordance with the use in the United States at, or immediately prior to, the date of importation, of articles of that class or kind to which the imported articles belong, and the controlling use is the chief use, i.e., the use which exceeds all other uses (if any) combined;

(ii) a tariff classification controlled by the actual use to which an imported article is put in the United States is satisfied only if such use is intended at the time of importation, the article is so used, and proof thereof is furnished within 3 years after the date the article is entered;

(f) an article is in chief value of a material if such material exceeds in value each other single component material of the article;

(g) a headnote provision which enumerates articles not included in a schedule, part, or subpart is not necessarily exhaustive, and the absence of a particular article from such headnote provision shall not be given weight in determining the relative specificity of competing provisions which describe such article;

(h) unless the context requires otherwise, a tariff description for an article covers such article, whether assembled or not assembled, and whether finished or not finished;

(ij) a provision for "parts" of an article covers a product solely or chiefly used as a part of such article, but does not prevail over a specific provision for such part.

11. Issuance of Rules and Regulations. The Secretary of the Treasury is hereby authorized to issue rules and regulations governing the admission of articles under the provisions of the schedules. The allowance of an importer's claim for classification, under any of the provisions of the schedules which provide for total or partial relief from duty or other import restrictions on the basis of facts which are not determinable from an examination of the article itself in its condition as imported, is dependent upon his complying with any rules or regulations which may be issued pursuant to this headnote.

12. The Secretary of the Treasury is authorized to prescribe methods of analyzing, testing, sampling, weighing, gauging, measuring, or other methods of ascertainment whenever he finds that such methods are necessary to determine the physical, chemical, or other properties or characteristics of articles for purposes of any law administered by the Customs Service.

General statistical headnotes:

1. Statistical Requirements for Imported Articles. Persons making customs entry or withdrawal of articles imported into the customs territory of the United States shall complete the entry or withdrawal forms, as provided herein and in regulations issued pursuant to law, to provide for statistical purposes information as follows:

(a) the number of the Customs district and of the port where the articles are being entered for consumption or warehouse, as shown in Statistical Annex A of these schedules;

(b) the name of the carrier or the means of transportation by which the articles were transported to the first port of unloading in the United States;

(c) the foreign port of lading;

(d) the United States port of unlading;

(e) the date of importation;

(f) the country of origin of the articles expressed in terms of the designation therefor in Statistical Annex B of these schedules;

(g) a description of the articles in sufficient detail to permit the classification thereof under the proper statistical reporting number in these schedules;

(h) the statistical reporting number under which the articles are classifiable;

(i,j) gross weight in pounds for the articles covered by each reporting number when imported in vessels or aircraft;

(k) the net quantity in the units specified herein for the classification involved;

(l) the U.S. dollar value in accordance with the definition in Section 402 or 402a of the Tariff Act of 1930, as amended, for all merchandise including that free of duty or dutiable at specific rates; and

(m) such other information with respect to the imported articles as is provided for elsewhere in these schedules.

General Headnotes and Rules of Interpretation

2. Statistical Annotations. (a) The statistical annotations to the Tariff Schedules of the United States consist of --

(i) the 2-digit statistical suffixes,
(ii) the indicated units of quantity,
(iii) the statistical headnotes and annexes, and
(iv) the italicised article descriptions.

(b) The legal text of the Tariff Schedules of the United States consists of the remaining text as more specifically identified in headnote 10(a) of the general headnotes and rules of interpretation.

(c) The statistical annotations are subordinate to the provisions of the legal text and cannot change their scope.

3. Statistical Reporting Number. (a) General Rule: Except as provided in paragraph (b) of this headnote, and in the absence of specific instructions to the contrary elsewhere, the statistical reporting number for an article consists of the 7-digit number formed by combining the 5-digit item number with the appropriate 2-digit statistical suffix. Thus, the statistical reporting number for live monkeys dutiable under item 100.95 is "100.9520".

(b) Wherever in the tariff schedules an article is classifiable under a provision which derives its rate of duty from a different provision, the statistical reporting number is, in the absence of specific instructions to the contrary elsewhere, the 7-digit number for the basic provision followed by the item number of the provision from which the rate is derived. Thus, the statistical reporting number of mixed apple and grape juices, not containing over 1.0 percent of ethyl alcohol by volume, is "165.6500-165.40".

4. Abbreviations. (a) The following symbols and abbreviations are used with the meanings respectively indicated below:

s. ton	-	short ton
C.	-	one hundred
Cwt.	-	100 lbs.
mg.	-	milligram
M.	-	1,000
bd. ft.	-	board feet
M. bd. ft.	-	1,000 board feet
mc.	-	millicurie
cord	-	128 cubic feet
square	-	amount to cover 100 square feet of surface
sup. ft.	-	superficial foot
oz.	-	ounces avoirdupois
fl. oz.	-	fluid ounce
oz. troy	-	troy ounce
pf. gal.	-	proof gallon

(b) An "X" appearing in the column for units of quantity means that no quantity (other than gross weight) is to be reported.

(c) Whenever two separate units of quantity are shown for the same article, the "v" following one of such units means that the value of the article is to be reported with that quantity.

HISTORICAL NOTES

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Amendments and Modifications

PROVISIONS	
Gen Hdnte 3(a)(i)	Language "Except as provided in headnote 6 of schedule 7, part 2, subpart E," added; language "except that all articles" deleted and language "except that all such articles" inserted in lieu thereof. Pub. L. 89-805, Secs. 1(a), (c), Nov. 10, 1966, 80 Stat. 1521, 1522, effective date Jan. 1, 1967.
	Language "Except as provided in headnote 4 of schedule 7, part 7, subpart A," added. Pub. L. 89-806, Secs. 2(b), (c), Nov. 10, 1966, 80 Stat. 1523, effective date March 11, 1967.

PROVISIONS	
Gen Hdnte 3(d), (e), (f) and (g)	Headnotes 3(d), (e), and (f) redesignated as headnotes 3(e), (f), and (g), respectively, and new headnote 3(d) added. Pub. L. 89-283, Secs. 401(a), 403, Oct. 21, 1965, 79 Stat. 1021, 1022; entered into force Oct. 22, 1965, by Pres. Proc. 3682, Oct. 21, 1965, 3 CFR, 1965 Supp., p. 68.
Gen Hdnte 6(b)(i)	Language "and containers of usual types ordinarily sold at retail with their contents," added. Pub. L. 89-241, Secs. 2(a), 4, Oct. 7, 1965, 79 Stat. 933, 934, effective date Dec. 7, 1965.

SCHEDULE 5. - NONMETALLIC MINERALS AND PRODUCTS

SCHEDULE 5. - NONMETALLIC MINERALS AND PRODUCTS

Part 1 - Nonmetallic Minerals and Products, Except Ceramic Products and Glass and Glass Products

- A. Hydraulic Cement; Concrete; Concrete Products
- B. Lime, Gypsum, and Plaster Products
- C. Stone and Stone Products
- D. Mica and Mica Products
- E. Graphite and Related Products
- F. Asbestos and Asbestos Products
- G. Abrasives and Abrasive Articles
- H. Gems, Gemstones, and Articles Thereof; Industrial Diamonds
- J. Miscellaneous Nonmetallic Minerals and Products
- K. Nonmetallic Minerals and Products Not Specially Provided For

Part 2 - Ceramic Products

- A. Refractory and Heat-Insulating Articles
- B. Ceramic Construction Articles
- C. Table, Kitchen, Household, Art and Ornamental Pottery
- D. Industrial Ceramics
- E. Ceramic Articles Not Specially Provided For

Part 3 - Glass and Glass Products

- A. Glass in the Mass; Glass in Balls, Tubes, Rods, and Certain Other Forms; Foam Glass; Optical Glass; and Glass Fibers and Products Thereof
- B. Flat Glass and Products Thereof
- C. Glassware and Other Glass Products
- D. Glass Articles Not Specially Provided For

SCHEDULE 5. - NONMETALLIC MINERALS AND PRODUCTS
Part 1. - Nonmetallic Minerals and Products, Except Ceramic Products and Glass and Glass Products

5 - 1 - H
520.11 - 520.61

Item	Stat. Suf-fix	Articles	Units of Quantity	Rates of Duty 1	Rates of Duty 2
		Subpart H. - Gems, Gemstones, and Articles Thereof; Industrial Diamonds			
		Subpart H headnotes:			
		1. The provisions of this subpart do not cover -- (i) abrasives other than diamond dust or powder, and abrasive articles (see subpart G of this part); (ii) drills and other tools provided for in part 5L of schedule 6; (iii) recording or transcribing styluses, needles, and points (see part 5 of schedule 6); (iv) optical elements (see part 2A of schedule 7); (v) jewel bearings (see part 2E of schedule 7); or (vi) jewelry and other articles provided for in part 6 of schedule 7.			
		2. For the purposes of the tariff schedules, the term "precious stones" means natural diamonds, emeralds, rubies, and sapphires.			
520.11		Precious and semiprecious stones, natural (except industrial diamonds), whether in their natural form or broken but not advanced in condition or value from their natural state, and not set.....	.....	Free	Free
	20	*Diamonds*.....	*Carat*		
	40	*Other*.....	*X*		
		Industrial diamonds, natural or synthetic, whether or not advanced in condition or value from their crude state by cleaving, cutting, lapping, sawing, or other process, but not set and not suitable for use in the manufacture of jewelry:			
		Synthetic:			
520.19	00	Miners' diamonds.....	Carat...	Free	Free
520.20	00	Powder or dust.....	Carat...	Free	Free
520.21	00	Other.....	Carat...	13% ad val.	30% ad val.
		Natural:			
520.23	00	Miners' diamonds.....	Carat...	Free	Free
520.27	00	Crushing bort.....	Carat...	Free	Free
520.28	00	Powder or dust.....	Carat...	Free	Free
		Other:			
520.29	00	Not advanced in condition or value.....	Carat...	Free	Free
520.31	00	Advanced in condition or value.....	Carat...	13% ad val.	30% ad val.
		Precious and semiprecious stones, cut but not set, and suitable for use in the manufacture of jewelry:			
		Diamonds:			
520.32	00	Weighing not over 0.5 carat.....	Carat...	7% ad val.	10% ad val.
520.33	00	Weighing over 0.5 carat.....	Carat...	9% ad val.	10% ad val.
520.34		If products of Cuba.....	.....	8% ad val. (s)	
520.35	00	Rubies and sapphires.....	X.....	7% ad val.	10% ad val.
520.37	00	Marcasites.....	X.....	9% ad val.	20% ad val.
520.38	00	Emeralds.....	Carat...	2% ad val.	10% ad val.
520.39	00	Other.....	X.....	4% ad val.	10% ad val.
		Other precious and semiprecious stones, and articles not specially provided for, of such stones:			
520.51	00	Of precious stones.....	X.....	13% ad val.	30% ad val.
520.54	00	Of rock crystal.....	X.....	18.5% ad val.	50% ad val.
520.61	00	Other.....	X.....	38% ad val.	50% ad val.

(s) = Suspended. See general headnote 3(b).

SCHEDULE 5. - NONMETALLIC MINERALS AND PRODUCTS
Part 1. - Nonmetallic Minerals and Products, Except Ceramic Products and Glass and Glass Products

Item	Stat. Suf-fix	Articles	Units of Quantity	Rates of Duty 1	Rates of Duty 2
		Synthetic materials of gemstone quality, such as, but not limited to, corundum, spinel, and rutile, and articles not specially provided for, of such materials:			
520.71	00	Synthetic materials, cut but not set, and suitable for use in the manufacture of jewelry	No.....	7% ad val.	10% ad val.
520.75	00	Other	X.....	27% ad val.	30% ad val.
		Subpart J. - Miscellaneous Nonmetallic Minerals and Products			
521.11	00	Asphaltum, bitumen, and limestone-rock asphalt	Ton.....	Free	Free
521.17	00	Bauxite, calcined	Ton.....	44¢ per ton 1/	$1 per ton 1/
521.21		Brazilian pebble, crude	.....	Free	Free
	20	*Valued not over 50¢ per lb*	*Lb.*		
	40	*Valued over 50¢ per lb*	*Lb.*		
521.31		Coal of all classifications, including culm and slack, and including lignite but not including peat; coke commercially suitable for use as fuel; and compositions of coal, coke, or other carbonaceous material, whether in briquet or other form, used for fuel	.....	Free	Free
	20	*Bituminous coal*	*S. ton*		
	40	*Coke*	*S. ton*		
	60	*Compositions used for fuel*	*S. ton*		
	80	*Other*	*S. ton*		
		Clays, whether or not washed, ground, or otherwise beneficiated:			
521.41	00	China clay or kaolin	Ton.....	60¢ per ton	$2.50 per ton
		Fuller's earth:			
521.51	00	Not beneficiated	Ton.....	45¢ per ton	$1.50 per ton
521.54	00	Wholly or partly beneficiated	Ton.....	90¢ per ton	$3.25 per ton
521.61	00	Bentonite	Ton.....	73¢ per ton	$3.25 per ton
		Common blue clay and other ball clays:			
521.71	00	Not beneficiated	Ton.....	58¢ per ton	$1 per ton
521.74	00	Wholly or partly beneficiated	Ton.....	$1.13 per ton	$2 per ton
		Other clays:			
521.81	00	Not beneficiated	Ton.....	40¢ per ton	$1 per ton
521.84	00	Wholly or partly beneficiated	Ton.....	90¢ per ton	$2 per ton
521.87	00	Any of the foregoing clays artificially activated with acid or other material	Lb.....	0.09¢ per lb. + 11% ad val.	0.25¢ per lb. + 30% ad val.
521.91	00	Cryolite or kryolith	S. ton..	Free	Free
522.11	00	Diatomite, crude or processed	Ton.....	Free	Free
		Fluorspar:			
522.21	00	Containing over 97% by weight of calcium fluoride	Ton.....	$2.10 per ton	$5.60 per ton
522.24	00	Containing not over 97% by weight of calcium fluoride	Ton.....	$8.40 per ton	$8.40 per ton
		Natural mineral fluxes:			
		Crude:			
522.31	00	Feldspar	Ton.....	10¢ per ton	50¢ per ton
522.33	00	Nepheline syenite	Ton.....	Free	Free
522.35	00	Cornwall stone	S. ton..	Free	Free
522.37	00	Other	Ton.....	Free	Free
		Crushed (otherwise than merely to facilitate shipment to the United States), ground, or pulverized:			
522.41	00	Feldspar	Ton.....	6.5% ad val.	30% ad val.
522.43	00	Nepheline syenite	Ton.....	Free	Free
522.45	00	Other	S. ton..	13% ad val.	30% ad val.

1/ Duty temporarily suspended by legislation. See Appendix to Tariff Schedules.

SCHEDULE 5. - NONMETALLIC MINERALS AND PRODUCTS
Part 1. - Nonmetallic Minerals and Products, Except Ceramic Products and Glass and Glass Products

5 - 1 - J, K
522.51 - 523.94

Item	Stat. Suf-fix	Articles	Units of Quantity	Rates of Duty 1	Rates of Duty 2
522.51	00	Ice	S. ton	Free	Free
		Magnesite:			
522.61	00	Crude	Ton	$4.72 per ton	$10.50 per ton
522.64	00	Caustic calcined	Ton	$9.45 per ton	$21 per ton
522.71	00	Meerschaum, crude	Lb	3.5% ad val.	20% ad val.
522.81	00	Mineral wool, in bulk, or in batts, blankets, or similar forms, whether or not lined, backed, or supported with paper, paperboard, or similar materials	X	13% ad val.	30% ad val.
523.11	00	Silica, not specially provided for	Ton	Free	Free
		Talc, steatite, and soapstone, and articles, of one or more of these substances:			
523.31	00	Crude and not ground	Lb	0.02¢ per lb.	0.25¢ per lb.
523.33	00	Ground, washed, powdered, or pulverized	S. ton	10.5% ad val.	35% ad val.
523.35	00	Cut or sawed, or in blanks, crayons, cubes, disks, or other forms	Lb	0.4¢ per lb.	1¢ per lb.
523.37	00	Other, not specially provided for	X	21.5% ad val.	35% ad val.
523.41	00	Zaffer	Lb	Free	Free
523.51	00	Articles not specially provided for, of carbonate of magnesia	Lb	0.9¢ per lb.	2¢ per lb.
523.61	00	Articles not specially provided for, of pumice	X	12.5% ad val.	35% ad val.

Subpart K. - Nonmetallic Minerals and Products Not Specially Provided For

Subpart K headnote:

1. This subpart covers mineral substances and articles of mineral substances, not provided for elsewhere in the schedules, but does not include:
   (i) chemical elements or chemical compounds in part 2 of schedule 4, or mineral substances provided for in other parts of schedule 4; or
   (ii) metal-bearing ores and other metal-bearing materials provided for in part 1 of schedule 6.

		Mineral substances, and articles of mineral substances, not specially provided for:			
523.81		Mineral substances, crude	.....	Free	Free
	20	*Kyanite, Sillimanite, Andalusite, and Dumortierite*	*Lb.*		
	40	*Lithium ores*	*Lb.*		
	60	*Other*	*X*		
		Other:			
523.91	00	Not decorated	X	13% ad val.	30% ad val.
523.94	00	Decorated	X	24% ad val.	40% ad val.

STAGED RATES AND HISTORICAL NOTES

Staged Rates

Notes p. 3
Schedule 5,
Part 1

Modifications of column 1 rates of duty by Pres. Proc. 3822 (Kennedy Round), Dec. 16, 1967, 32 F.R. 19002 (con.):

TSUS item	Prior rate	Rate of duty, effective with respect to articles entered on and after January 1 --				
		1968	1969	1970	1971	1972
519.95	5% ad val.	4% ad val.	4% ad val.	3% ad val.	3% ad val.	2.5% ad val.
519.97	15% ad val.	13% ad val.	12% ad val.	10% ad val.	9% ad val.	7.5% ad val.
520.21	15% ad val.	13% ad val.	12% ad val.	10% ad val.	9% ad val.	7.5% ad val.
520.31	15% ad val.	13% ad val.	12% ad val.	10% ad val.	9% ad val.	7.5% ad val.
520.32	8% ad val.	7% ad val.	6% ad val.	5.5% ad val.	4.5% ad val.	4% ad val.
520.33 2/	10% ad val.	9% ad val.	8% ad val.	7% ad val.	6% ad val.	5% ad val.
520.35	8% ad val.	7% ad val.	6% ad val.	5.5% ad val.	4.5% ad val.	4% ad val.
520.37	10% ad val.	9% ad val.	8% ad val.	7% ad val.	6% ad val.	5% ad val.
520.38	3% ad val.	2% ad val.	1.5% ad val.	1% ad val.	0.5% ad val.	Free
520.39	5% ad val.	4% ad val.	4% ad val.	3% ad val.	3% ad val.	2.5% ad val.
520.51	15% ad val.	13% ad val.	12% ad val.	10% ad val.	9% ad val.	7.5% ad val.
520.54	21% ad val.	18.5% ad val.	16.5% ad val.	14.5% ad val.	12.5% ad val.	10.5% ad val.
520.61	42.5% ad val.	38% ad val.	34% ad val.	29.5% ad val.	25% ad val.	21% ad val.
520.71	8% ad val.	7% ad val.	6% ad val.	5.5% ad val.	4.5% ad val.	4% ad val.
520.75	30% ad val.	27% ad val.	24% ad val.	21% ad val.	18% ad val.	15% ad val.
521.17	55¢ per ton	44¢ per ton	33¢ per ton	22¢ per ton	11¢ per ton	Free
521.41	67¢ per ton	60¢ per ton	53¢ per ton	46¢ per ton	40¢ per ton	33¢ per ton
521.51	50¢ per ton	45¢ per ton	40¢ per ton	35¢ per ton	30¢ per ton	25¢ per ton
521.54	$1 per ton	90¢ per ton	80¢ per ton	70¢ per ton	60¢ per ton	50¢ per ton
521.61	81.25¢ per ton	73¢ per ton	65¢ per ton	56¢ per ton	48¢ per ton	40¢ per ton
521.71	62¢ per ton	58¢ per ton	54¢ per ton	50¢ per ton	46¢ per ton	42¢ per ton
521.74	$1.21 per ton	$1.13 per ton	$1.06 per ton	99¢ per ton	92¢ per ton	85¢ per ton
521.81	50¢ per ton	40¢ per ton	30¢ per ton	20¢ per ton	10¢ per ton	Free
521.84	$1 per ton	90¢ per ton	80¢ per ton	70¢ per ton	60¢ per ton	50¢ per ton
521.87	0.1¢ per lb. + 12.5% ad val.	0.09¢ per lb. + 11% ad val.	0.08¢ per lb. + 10% ad val.	0.07¢ per lb. + 8.5% ad val.	0.06¢ per lb. + 7% ad val.	0.05¢ per lb. + 6% ad val.
522.31	12.5¢ per ton	10¢ per ton	7¢ per ton	5¢ per ton	2¢ per ton	Free
522.41	7.5% ad val.	6.5% ad val.	6% ad val.	5% ad val.	4% ad val.	3.5% ad val.
522.45	15% ad val.	13% ad val.	12% ad val.	10% ad val.	9% ad val.	7.5% ad val.
522.61	$5.25 per ton	$4.72 per ton	$4.20 per ton	$3.67 per ton	$3.15 per ton	$2.62 per ton
522.64	$10.50 per ton	$9.45 per ton	$8.40 per ton	$7.35 per ton	$6.30 per ton	$5.25 per ton
522.71	4% ad val.	3.5% ad val.	3% ad val.	2.5% ad val.	2% ad val.	2% ad val.
522.81	15% ad val.	13% ad val.	12% ad val.	10% ad val.	9% ad val.	7.5% ad val.
523.31	0.05¢ per lb.	0.02¢ per lb.	0.02¢ per lb.	0.02¢ per lb.	0.02¢ per lb.	0.02¢ per lb.
523.33	12% ad val.	10.5% ad val.	9.5% ad val.	8% ad val.	7% ad val.	6% ad val.
523.35	0.5¢ per lb.	0.4¢ per lb.	0.4¢ per lb.	0.3¢ per lb.	0.2¢ per lb.	0.2¢ per lb.
523.37	24% ad val.	21.5% ad val.	19% ad val.	16.5% ad val.	14% ad val.	12% ad val.
523.51	1¢ per lb.	0.9¢ per lb.	0.8¢ per lb.	0.7¢ per lb.	0.5¢ per lb.	0.5¢ per lb.
523.61	14% ad val.	12.5% ad val.	11% ad val.	9.5% ad val.	8% ad val.	7% ad val.
523.91	15% ad val.	13% ad val.	12% ad val.	10% ad val.	9% ad val.	7.5% ad val.
523.94	27% ad val.	24% ad val.	21.5% ad val.	18.5% ad val.	16% ad val.	13.5% ad val.

1/ See footnote 1 to Kennedy Round Staged rates at the end of schedule 5, part 1.

2/ Subordinate Cuban provision (item 520.34) deleted, effective Jan. 1, 1969.

Other Amendments and Modifications

PROVISION	
Subpt A-headnote 1(b)	Language "(including bitumens and resins) with added sand, gravel, or other mineral aggregate" deleted and language "of mineral origin with added mineral aggregate such as sand, crushed stone, or gravel" inserted in lieu thereof. Pub. L. 89-241, Secs. 2(a), 27, Oct. 7, 1965, 79 Stat. 933, 939, effective date Dec. 7, 1965.

PROVISION	
513.34--513.35 513.36	Item 513.34 (column 1 rate--1¢ per short ton; column 2 rate--$1 per short ton) deleted and items 513.35 and 513.36 and heading immediately preceding item 513.35 added in lieu thereof. Pres. Proc. 3822 (Kennedy Round), Dec. 16, 1967, 32 F.R. 19002, effective date Jan. 1, 1968.

STAGED RATES AND HISTORICAL NOTES

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Schedule 5,
Part 1

Other Amendments and Modifications--(con.)

PROVISION	PROVISION
516.08--Item 516.08 added. Pub. L. 89-283, Secs. 401(a), 405(d), Oct. 21, 1965, 79 Stat. 1021, 1025; entered into force Dec. 20, 1965, by Pres. Proc. 3682, Oct. 21, 1965, 3 CFR, 1965 Supp., p. 65; effective with respect to articles entered on and after Jan. 16, 1966.	517.82--Item 517.82 added. Pub. L. 89-283, Secs. 401(a), 405(d), Oct. 21, 1965, 79 Stat. 1021, 1025; entered into force Dec. 20, 1965, by Pres. Proc. 3682, Oct. 21, 1965, 3 CFR, 1965 Supp., p. 65; effective with respect to articles entered on and after Jan. 16, 1966.
517.30 517.31 517.33--Item 517.31 (column 1 rate--0.5% ad val.; column 2 rate--30% ad val.) deleted and items 517.30 and 517.33 and heading immediately preceding item 517.30 added in lieu thereof. Pub. L. 89-432, Secs. 3(a), (c), May 31, 1966, 80 Stat. 169, effective date July 1, 1966. The rates of duty for item 517.31 had been temporarily suspended for graphite valued $50 per ton or less by former item 909.20 Items 517.30 (column 1 rate--free; column 2 rate--30% ad val.) and 517.33 (column 1 rate--0.5% ad val.; column 2 rate--30% ad val.) and heading immediately preceding item 517.30 deleted and item 517.31 added in lieu thereof. Pub. L. 89-808, Nov. 16, 1967, 81 F.R. 14001, effective date Jan. 1, 1968.	520.19--Item 520.21 (column 1 rate--15% ad val.; column 2 520.20 rate--30% ad val.) deleted and new items 520.19, 520.21 520.20, and 520.21 and heading immediately preceding item 520.19 added in lieu thereof. Pub. L. 89-241, Sec. 28, Oct. 7, 1965, 79 Stat. 939, effective date Oct. 8, 1965. 521.71--Column 1 rate of duty of 73¢ per ton reduced to 62¢ per ton on Jan. 1, 1964. General headnote 3(g). 521.74--Column 1 rate of duty of $1.45 per ton reduced to $1.21 per ton on Jan. 1, 1964. General headnote 3(g).

Statistical Notes

PROVISION	Effective date
511.21-- 00--Estab.(transferred to 511.1820 & 20).....July 1, 1967 20--Disc.(transferred to 511.1840).....do 40--Disc.....do	
512.01--See Other Amendments and Modifications 01--Disc.(transferred to 512.4000 & 6000).....Jan. 1, 1968	
513.20--See Other Amendments and Modifications 00--Estab.(transferred from 624.250pt)(a).....Jan. 1, 1968	
513.50--See Other Amendments and Modifications 00--Estab.(transferred from 513.2100pt)(a).....Jan. 1, 1967	
520.41-- 10--Estab.(transferred from 520.4740).....Jan. 1, 1967 50--Disc.(transferred to 520.5150pt).....do 60--Disc.(transferred to 520.5160).....do 70--Estab.(transferred from 520.4740 & 60).....do 80--Disc.(transferred to 520.5170).....do	
520.80--See Other Amendments and Modifications 00--Estab.(transferred from 520.2100pt)-- 520.7800pt & 520.8400pt).....Oct. 8, 1965	
521.20--See Other Amendments and Modifications 00--Estab.(transferred from 521.2000).....Jan. 1, 1968 Disc.(transferred to 521.2100).....Jan. 1, 1968	
521.21--See Other Amendments and Modifications 00--Natural graphite valued 10¢ per ton or less temporarily transferred to 909.2000.....Jan. 1, 1968 Disc.(transferred to 521.2200).....July 1, 1967 Estab.(transferred from 521.2100 & 521.2200).....Jan. 1, 1968	
521.91--See Other Amendments and Modifications 00--Estab.(transferred from 521.9100).....July 1, 1967	
522.10--See Other Amendments and Modifications 00--Estab.(transferred from 522.2100pt).....Dec. 20, 1965	
522.20--See Other Amendments and Modifications 00--Estab.(transferred from 522.2100pt).....Dec. 20, 1965	
522.21--See Other Amendments and Modifications 00--Synthetic miners' diamonds and synthetic powder or dust transferred to 520.1900 & 520.2000.....Oct. 8, 1965	
521.17--See Other Amendments and Modifications (item 909.30)	
521.71--See Other Amendments and Modifications	
521.74--See Other Amendments and Modifications	
523.91-- 00--Estab.(transferred from 523.9130 & 40).....Jan. 1, 1968 20--Disc.(transferred to 523.9100).....do 40--Disc.....do	

APPENDIX TO THE TARIFF SCHEDULES

APPENDIX TO THE TARIFF SCHEDULES

Appendix Headnotes:

1. The provisions of this Appendix relate to legislation and to executive and administrative actions pursuant to duly constituted authority, under which --

(a) one or more of the provisions in schedules 1 through 8 are temporarily amended or modified, or

(b) additional duties or other import restrictions are imposed by, or pursuant to, collateral legislation.

2. Unless the context requires otherwise, the general headnotes and rules of interpretation and the respective schedule, part, and subpart headnotes in schedules 1 through 8 apply to the provisions of this Appendix.

Appendix statistical headnotes:

1. For statistical reporting of merchandise provided for herein --

(a) unless more specific instructions appear in the parts or subparts of this appendix, report the 5-digit item number (or 7-digit number, if any) found in the appendix in addition to the 7-digit number appearing in schedules 1-7 which would be applicable but for the provisions of this appendix; and

(b) the quantities reported should be in the units provided in schedules 1-7.

2. For those items herein for which no rate of duty appears (i.e., those items for which an absolute quota is prescribed), report the 5-digit item number herein followed by the appropriate 7-digit reporting number from schedules 1-7. The quantities reported should be in the units provided in schedules 1-7.

APPENDIX TO THE TARIFF SCHEDULES
Part 1. - Temporary Legislation

9 - 1 - B
903.90 - 911.07

Item	Stat. Suffix	Articles	Units of Quantity	Rates of Duty 1	Rates of Duty 2	Effective Period
903.90	1/	Jute, processed (provided for in item 192.20, part 15C, schedule 1).....	1/	Free	Free	On or before 6/5/69
		Yarns, wholly of noncontinuous ramie fibers (provided for in part 1B, schedule 3):				
905.80	1/	Singles, not bleached and not colored, measuring over 58,800 yards per pound (item 308.40).....	1/	Free	Free	On or before 11/7/68
905.81	1/	Plied, not bleached and not colored, measuring over 29,400 yards per pound (item 308.30 and item 308.50).....	1/	Free	Free	
907.15	00	Aluminum oxide (alumina) (provided for in item 417.12, part 2C, schedule 4) when imported for use in producing aluminum.....	Ton.....	Free	Free	On or before 7/15/68
907.30	00	Heptanoic acid (provided for in item 425.98, part 2D, schedule 4).....	Lb.....	Free	Free	On or before 8/6/69
907.60	1/	Cansjera, chestnut, curupay, divi-divi, eucalyptus, hemlock, larch, tara, mangrove, myrobalan, oak, quebracho, sumac, urunday, wattle, and valonia, all the foregoing provided for in items 470.23, 470.25, 470.55, 470.57, and 470.65, part 9A, schedule 4.....	1/	Free	Free	On or before 9/30/69
909.25	00	Electrodes (provided for in item 517.61, part 1E, schedule 5) when imported for use in producing aluminum.....	S. tons..	Free	Free	On or before 7/15/68
909.30	1/	**Bauxite, calcined (provided for in item 521.17, part 1J, schedule 5)**.....	1/	**Free**	**Free**	**On or before 7/15/68**
911.05	1/	Bauxite ore (provided for in item 601.06, part 1, schedule 6).....	1/	Free	Free	On or before 7/15/68
911.07		Manganese ore, including ferruginous manganese ore, and manganiferous iron ore, all the foregoing containing over 10 percent by weight of manganese (provided for in item 601.27, part 1, schedule 6).....	.....	Free	1¢ per lb. on manganese content	On or before 6/30/70
	20	Containing under 35% by weight of manganese.....	Lb. manganese content..			
	40	Containing 35% or over, but less than 47% by weight of manganese.....	Lb. manganese content..			
	60	Containing 47% or more by weight of manganese.....	Lb. manganese content..			

1/ See Appendix statistical headnote 1.

HISTORICAL NOTES

Notes p. 1
Appendix,
Part 1

Amendments and Modifications

PROVISION	
901.00	Tax termination date extended from June 30, 1967 to June 30, 1972. Pub. L. 89-331, Secs. 13, 14, Nov. 8, 1965, 79 Stat. 1260, 1261.
Subpt B-Headnote 2	Conformance to item 915.25 added. Pub. L. 89-368, Secs. 303(b), (c), March 10, 1966, 80 Stat. 71, effective date March 10, 1966.
	Headnote 2 deleted. Pub. L. 89-436, Secs. 1(b), (c), May 31, 1966, 80 Stat. 169, effective date July 1, 1966.
903.30 903.31	Effective period extended from June 30, 1966 to June 30, 1969. Pub. L. 89-439, May 31, 1966, 80 Stat. 191.
903.30 903.31 903.32 903.40 903.45 903.44 903.45 903.46 903.47 903.48 903.49 903.60 903.61 903.65	Item 903.30, 903.31, and 903.32 (Copra); item 903.40 (Palm-nut kernels and palm nuts); items 903.43, 903.44, 903.45, 903.46, 903.47, 903.48, and 903.50 (Coconut oil); items 903.60 and 903.61 (Palm-kernel oil); item 903.65 (Palm oil), and headings immediately preceding such items deleted. Pub. L. 89-368, Secs. 4(g), 2, April 13, 1966, 80 Stat. 110, effective date April 13, 1966.
903.90	Effective period extended from Sept. 5, 1966 to Sept. 5, 1969. Pub. L. 89-575, Secs. 1(a), (b), Sept. 15, 1966, 80 Stat. 771, effective date Sept. 6, 1966.
904.40	Item 904.40 (Insulation of compressed cork) deleted. Pub. L. 89-481, Secs. 1(b), 2, May 26, 1966, 80 Stat. 168, 169, effective date May 27, 1966.
906.30 906.31	Effective period extended from Nov. 7, 1965 to Nov. 7, 1968. Pub. L. 89-229, Sec. 1, Oct. 1, 1965, 79 Stat. 901.
907.15	Effective period extended from July 15, 1964 to July 15, 1966. Pub. L. 88-362, July 7, 1964, 78 Stat. 298.
	Effective period extended from July 15, 1966 to July 15, 1968. Pub. L. 89-440, May 31, 1966, 80 Stat. 192.
907.30	Effective period extended from Aug. 8, 1966 to Aug. 8, 1969. Pub. L. 89-331, May 31, 1966, 80 Stat. 189.
907.70 907.71 907.72 907.73 907.74 907.75	Items 907.70, 907.71, 907.72, 907.73, 907.74, and 907.75 (Fatty substances derived from coconut, palm-kernel, or palm oil) and headings immediately preceding items 907.70 and 907.73 deleted. Pub. L. 89-368, Secs. 1(g), 2, April 13, 1966, 80 Stat. 110, effective date April 13, 1966.
907.77	Column 1 rate of duty of 17.5% ad val. reduced to 16% ad val. Pub. L. 89-241, Secs. 2(a), 56, Oct. 7, 1965, 79 Stat. 935, 950, effective date Dec. 7, 1965.
	Item 907.77 (Coconut, palm-kernel, and palm oils) deleted. Pub. L. 89-368, Secs. 1(g), 2, April 13, 1966, 80 Stat. 110, effective date April 13, 1966.

PROVISION	
907.80	Effective period extended from Sept. 30, 1966 to Sept. 30, 1969. Pub. L. 89-573, Sept. 13, 1966, 80 Stat. 769.
907.85 907.86 907.87 907.88	Items 907.85, 907.86, 907.87, and 907.88 (Fatty substances derived from coconut, palm-kernel, or palm oil) and heading preceding item 907.85 deleted. Pub. L. 89-368, Secs. 1(g), 2, April 13, 1966, 80 Stat. 110, effective date April 13, 1966.
909.20	Effective period extended from June 30, 1964 to June 30, 1966. Pub. L. 88-329, June 29, 1964, 78 Stat. 225, 226.
	Item 909.20 deleted. Pub. L. 89-133, Secs. 1(b), (c), Aug. 31, 1965, 79 Stat. 600, effective date July 1, 1966.
909.25	Item 909.25 added. Pub. L. 89-241, Secs. 87(a), (b), Oct. 7, 1965, 79 Stat. 950, effective date Oct. 8, 1965.
	Effective period extended from July 15, 1950 to July 15, 1968. Pub. L. 89-434, May 31, 1966, 80 Stat. 168.
909.30 911.05	**Effective period extended from July 15, 1964 to July 15, 1966. Pub. L. 88-362, July 7, 1964, 78 Stat. 298.**
	Effective period extended from July 15, 1966 to July 15, 1968. Pub. L. 89-440, May 31, 1966, 80 Stat. 192.
911.07	Item 911.07 added. Pub. L. 88-358, Secs. 1(a), (b), June 30, 1964, 78 Stat. 252, effective date July 1, 1964.
	Effective period extended from June 30, 1967 to June 30, 1970. Pub. L. 90-40, Secs. 1(a), (b), July 7, 1967, 81 Stat. 135, effective date July 1, 1967.
911.10 911.11 911.12	Effective period for items 911.10, 911.11, and 911.12 extended from June 30, 1964 to June 30, 1965. Pub. L. 88-324, June 29, 1964, 78 Stat. 222.
	Effective period for items 911.10, 911.11, and 911.12 extended from June 30, 1965 to June 30, 1967. Pub. L. 89-61, June 30, 1965, 79 Stat. 207.
	Item 911.10 amended by deleting in column 1-a "1.7¢ per lb. on 99.6% of copper content" and adding "Free" in lieu thereof; by deleting in columns 1-b and 2 "2¢ per lb. on 99.6% of copper content" and "4¢ per lb. on 99.6% of copper content", respectively, and adding "No change" in lieu thereof; and by extending the effective period from June 30, 1967 to June 30, 1968. Pub. L. 89-468, Secs. 1(a), (b), 2, June 23, 1966, 80 Stat. 218, 219, effective date Feb. 9, 1966.

APPENDIX B

VALUE OF U.S. IMPORTS FOR CONSUMPTION
1965 and 1966

Value of U.S. imports for consumption, by TSUS items included in the individual summaries of this volume, total and from the 3 principal suppliers, 1965

(In thousands of dollars. The dollar value of imports shown is defined generally as the market value in the foreign country and therefore excludes U.S. import duties, freight, and transportation insurance)

TSUS item	All countries		First supplier		Second supplier		Third supplier	
	Amount in 1965	Percent change from 1964	Country	Value	Country	Value	Country	Value
Precious and semiprecious stones (p. 3)								
520.11	178,184	17.0	U. K.	113,724	Rep. S. Af.	15,379	Switzerland	10,090
Industrial diamonds (p. 11)								
520.19	5	1/	Rep. S. Af.	5	-	-	-	-
520.20	354	1/	Ireland	304	Sweden	29	Japan	19
520.21	1,329	35.1	Ireland	968	U. K.	187	Sweden	166
520.23	3,700	-9.2	Ireland	3,169	Cen. Af. Rep.	144	Rep. S. Af.	133
520.27	6,875	-28.0	Ireland	3,508	U. K.	1,630	Congo	409
520.28	10,194	49.0	Ireland	6,716	U. K.	1,279	Rep. S. Af.	859
520.29	33,188	-13.9	Rep. S. Af.	8,347	Belgium	3,083	Ghana	2,901
520.31	31	-31.2	Netherlands	12	U. K.	11	Switzerland	3
Precious and semiprecious stones, cut but not set (p. 21)								
520.32	105,953	20.7	Belgium	56,261	Israel	40,473	Rep. S. Af.	2,289
520.33	25,875	23.2	Belgium	17,662	Rep. S. Af.	3,877	Israel	1,661
520.35	4,769	16.5	India	1,599	Ceylon	617	Switzerland	443
520.37	3	14.0	Switzerland	2	Hong Kong	2/	-	-
520.38	5,397	67.7	India	2,245	Colombia	1,112	Switzerland	882
520.39	3,630	21.0	Hong Kong	1,377	W. Germany	485	Japan	353
Other precious and semiprecious stones (p. 33)								
520.51	4	-41.2	Switzerland	1	W. Germany	1	Canada	1
520.54	46	-7.6	Japan	20	W. Germany	20	France	5
520.61	168	7.6	Japan	84	W. Germany	27	Hong Kong	12
Synthetic material of gemstone quality (p. 39)								
520.71	1,007	61.6	W. Germany	751	Switzerland	203	France	26
520.75	201	25.8	Swtizerland	81	France	81	W. Germany	30
Asphaltum, bitumen (p. 45)								
521.11	14,810	5.0	Neth. Antilles	8,148	Venezuela	5,866	Canada	568
Calcined bauxite (p. 51)								
521.17	5,568	21.4	British Guiana	4,162	Surinam	1,143	Trinidad	259
Brazilian pebble (p. 57)								
521.21	1,083	68.0	Brazil	1,031	Argentina	26	Japan	15
Coal (p. 61)								
521.31	3,148	-20.9	Canada	2,960	W. Germany	177	Netherlands	9

See footnotes at end of table.

Value of U.S. imports for consumption, by TSUS items included in the individual summaries of this volume, total and from the 3 principal suppliers, 1965--Continued

(In thousands of dollars. The dollar value of imports shown is defined generally as the market value in the foreign country and therefore excludes U.S. import duties, freight, and transportation insurance)

TSUS item	All countries: Amount in 1965	All countries: Percent change from 1964	First supplier: Country	First supplier: Value	Second supplier: Country	Second supplier: Value	Third supplier: Country	Third supplier: Value
Clays (p. 83)								
521.41	1,768	-21.9	U. K.	1,665	Canada	94	Mexico	8
521.51	3/	-	-	-	-	-	-	-
521.54	2	76.6	U. K.	2	-	-	-	-
521.61	18	203.1	Mexico	8	Italy	7	Greece	3
521.71	111	-16.2	U. K.	111	-	-	-	-
521.74	104	31.7	U. K.	104	-	-	-	-
521.81	5	332.7	W. Germany	5	Canada	2/	-	-
521.84	44	61.0	W. Germany	23	U. K.	20	Canada	1
Artificially activated clays (p. 105)								
521.87	86	-30.4	Canada	54	W. Germany	29	U. K.	3
Cryalite or kryolith (p. 109)								
521.91	2,009	13.8	Italy	1,068	Greenland	793	Spain	62
Diatomite (p. 115)								
522.11	9	-56.6	Canada	7	W. Germany	1	Iceland	2/
Fluorspar (p. 119)								
522.21	13,661	25.5	Mexico	8,944	Spain	3,307	Italy	874
522.24	6,297	5.0	Mexico	5,804	Japan	207	Canada	200
Natural mineral fluxes (p. 135)								
522.31	2	80.1	Canada	2	-	-	-	-
522.33	2	1/	Canada	2	-	-	-	-
522.35	-	-	-	-	-	-	-	-
522.37	33	9211.0	Canada	33	-	-	-	-
522.41	92	8.2	Canada	91	Rep. S. Af.	1	-	-
522.43	2,442	5.3	Canada	2,442	-	-	-	-
522.45	2	-28.8	U. K.	2	-	-	-	-
Ice (p. 145)								
522.51	1	3/	Canada	1	-	-	-	-
Magnesite (p. 149)								
522.61	1	147.3	India	1	Canada	2/	-	-
522.64	592	20.1	India	404	Australia	70	Yugoslavia	29
Meerschaum (p. 155)								
522.71	28	-25.2	Turkey	25	Somali Rep.	2	France	2/
Mineral Wool (p. 157)								
522.81	2	-19.4	Canada	2	-	-	-	-
Silica (p. 159)								
523.11	98	-19.3	Mexico	37	Canada	61	U. K.	2/

See footnotes at end of table.

Value of U.S. imports for consumption, by TSUS items included in the individual summaries of this volume, total and from the 3 principal suppliers, 1965--Continued

(In thousands of dollars. The dollar value of imports shown is defined generally as the market value in the foreign country and therefore excludes U.S. import duties, freight, and transportation insurance)

TSUS item	All countries		First supplier		Second supplier		Third supplier	
	Amount in 1965	Percent change from 1964	Country	Value	Country	Value	Country	Value
Talc, steatite and soapstone (p. 163)								
523.31	4	-73.7	India	4	-	-	-	-
523.33	739	-13.6	Italy	535	France	115	Canada	62
523.35	90	94.1	Japan	87	Italy	3	-	-
523.37	34	-206.9	W. Germany	26	Canada	6	Taiwan	1
Zaffer (p. 175)								
523.41	-	-	-	-	-	-	-	-
Articles of magnesium carbonate not elsewhere enumerated (p. 177)								
523.51	2	1/	Canada	1	Japan	1	-	-
Nonmetallic minerals and products not elsewhere enumerated (p. 179)								
523.81	2,034	-12.1	Canada	615	Rep. S. Af.	593	Zambia	247
523.91	1,630	-22.6	Canada	376	Sweden	345	W. Germany	180
523.94	427	347.6	Italy	385	Mexico	16	Japan	10

1/ No imports in 1964.
2/ Less than $500.
3/ No imports in 1965

Value of U.S. imports for consumption, by TSUS items included in the individual summaries of this volume, total and from the 3 principal suppliers, 1966

(In thousands of dollars. The dollar value of imports shown is defined generally as the market value in the foreign country and therefore excludes U.S. import duties, freight, and transportation insurance)

TSUS item	All countries		First supplier		Second supplier		Third supplier	
	Amount in 1966	Percent change from 1965	Country	Value	Country	Value	Country	Value
Precious and semiprecious stones (p. 3)								
520.11	210,522	18.1	U. K.	131,850	Rep. S. Af.	13,123	Central Af. Rep.	9,835
Industrial diamonds (p. 11)								
520.19	49	817.7	Rep. S. Af.	25	Canada	24	-	-
520.20	3,949	1,014.0	Ireland	2,674	Sweden	404	Japan	360
520.21	6	-99.6	Canada	4	Sweden	1	Japan	1
520.23	4,142	11.9	Ireland	3,114	Rep. S. Af.	415	Brazil	129
520.27	8,079	17.5	Ireland	3,720	Cango	2,762	Rep. S. Af.	568
520.28	12,960	27.1	Ireland	9,757	U. K.	958	Belgium	937
520.29	39,900	20.2	U. K.	9,121	Ireland	5,973	Rep. S. Af.	8,847
520.31	25	-21.2	Netherlands	6	Rep. S. Af.	5	U. K.	3
Precious and semiprecious stones, cut but not set (p. 21)								
520.32	136,313	28.7	Belgium	74,142	Israel	49,255	Rep. S. Af.	2,918
520.33	29,424	13.7	Belgium	20,212	Rep. S. Af.	4,083	Israel	2,191
520.35	7,163	50.2	India	2,327	Thailand	1,622	Ceylon	1,182
520.37	5	113.6	U. K.	4	India	1	-	-
520.38	6,025	11.6	India	2,608	Switzerland	1,180	Colombia	667
520.39	4,972	37.0	Hong Kong	992	Japan	967	W. Germany	920
Other precious and semiprecious stones (p. 33)								
520.51	48	1,079.2	Israel	21	U. K.	13	Belgium	7
520.54	54	19.3	W. Germany	23	Japan	14	France	8
520.61	218	29.8	Japan	128	W. Germany	19	Taiwan	16
Synthetic material of gemstone quality (p. 39)								
520.71	1,178	17.1	W. Germany	918	Switzerland	167	France	48
520.75	132	-34.1	Switzerland	70	France	38	W. Germany	19
Asphaltum, bitumen (p. 45)								
521.11	13,870	-6.3	Neth. Antilles	7,671	Venezuela	5,380	Canada	674
Calcined bauxite (p. 51)								
521.17	6,005	7.8	Guyana	4,325	Surinam	1,036	Trinidad	640
Brazilian pebble (p. 57)								
521.21	896	-17.3	Brazil	881	Japan	12	France	2
Coal (p. 61)								
521.31	3,607	14.6	Canada	3,282	W. Germany	285	Switzerland	31
Clays (p. 83)								
521.41	2,389	35.1	U. K.	2,388	Canada	1	-	-
521.51	22	1/	Surinam	20	U. K.	2	-	-
521.54	2	36.9	U. K.	2	-	-	-	-
521.61	7	-58.4	Italy	7	-	-	-	-
521.71	146	31.9	U. K.	146	-	-	-	-
521.74	112	7.2	U. K.	111	W. Germany	1	-	-
521.81	13	145.2	W. Germany	10	Canada	3	-	-
521.84	117	168.5	U. K.	103	W. Germany	10	Canada	4

See footnotes at end of table.

Value of U.S. imports for consumption, by TSUS items included in the individual summaries of this volume, total and from the 3 principal suppliers, 1966--Continued

(In thousands of dollars. The dollar value of imports shown is defined generally as the market value in the foreign country and therefore excludes U.S. import duties, freight, and transportation insurance)

TSUS item	All countries		First supplier		Second supplier		Third supplier	
	Amount in 1966	Percent change from 1965	Country	Value	Country	Value	Country	Value
Artificially activated clays (p. 105)								
521.87	74	-14.1	W. Germany	38	Canada	36	-	-
Cryolite or Kryolith (p. 109)								
521.91	3,199	59.3	France	1,153	Italy	1,025	Greenland	728
Diatomite (p. 115)								
522.11	48	422.2	Mexico	41	Canada	6	W. Germany	1
Fluorspar (p. 119)								
522.21	14,934	9.3	Mexico	9,298	Spain	4,124	Italy	1,499
522.24	7,034	11.7	Mexico	6,576	Rep. S. Af.	311	Canada	134
Natural mineral fluxes (p. 135)								
522.31	2/	-	-	-	-	-	-	-
522.33	3	71.8	Canada	3	-	-	-	-
522.35	2/	-	-	-	-	-	-	-
522.37	54	62.4	Canada	54	-	-	-	-
522.41	86	-7.2	Canada	86	-	-	-	-
522.43	2,871	17.6	Canada	2,871	U. K.	3/	-	-
522.45	16	590.4	Canada	15	U. K.	1	-	-
Ice (p. 145)								
522.51	2/	-	-	-	-	-	-	-
Magnesite (p. 149)								
522.61	21	1,657.7	India	21	-	-	-	-
522.64	743	25.5	India	466	Turkey	95	Australia	77
Meerschaum (p. 155)								
522.71	24	-13.4	Turkey	24	-	-	-	-
Mineral wool (p. 157)								
522.81	2/	-	-	-	-	-	-	-
Silica (p. 159)								
523.11	95	-2.9	Canada	47	W. Germany	24	Mexico	18
Talc, steatite and soapstone (p. 163)								
523.31	8	103.5	Korea	3	India	3	Canada	2
523.33	680	-7.9	Italy	451	France	116	Canada	64
523.35	139	54.2	Japan	130	Canada	4	Italy	4
523.37	7	-78.9	Taiwan	3	Canada	2	Thailand	1
Zaffer (p. 175)								
523.41	1	1/	Italy	1	-	-	-	-
Articles of magnesium carbonate not elsewhere enumerated (p. 177)								
523.51	2/	-	-	-	-	-	-	-

See footnotes at end of table.

Value of U.S. imports for consumption, by TSUS items included in the individual summaries of this volume, total and from the 3 principal suppliers, 1966--Continued

(In thousands of dollars. The dollar value of imports shown is defined generally as the market value in the foreign country and therefore excludes U.S. import duties, freight, and transportation insurance)

TSUS item	All countries		First supplier		Second supplier		Third supplier	
	Amount in 1966	Percent change from 1965	Country	Value	Country	Value	Country	Value
Nonmetallic minerals and products not elsewhere enumerated (p. 179)								
523.81	2,407	18.4	Rep. S. Af.	914	Canada	867	Rhodesia	306
523.91	3,624	1/	Sweden	1,463	Canada	661	W. Germany	435
523.94	166	-61.1	Italy	135	Netherlands	9	Japan	7

1/ No imports in 1965.
2/ No imports in 1966.
3/ Less than $500.

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