ARSENIC

(Data in metric tons of arsenic unless otherwise noted)

Domestic Production and Use: Arsenic has not been produced in the United States since 1985, and therefore, imported arsenic trioxide and arsenic metal have satisfied domestic needs. Arsenic was mainly imported as arsenic trioxide for use in the production of chromated copper arsenate (CCA) wood preservatives. Arsenic trioxide was also used in fertilizers, fireworks, herbicides, and insecticides. Arsenic metal was used as an alloying element in ammunition and solders, as an antifriction additive to metals used for bearings, and as an alloying element to strengthen lead-acid storage battery grids. The electronics industry required high-purity arsenic (99.9999% pure) for gallium-arsenide semiconductors for telecommunication, solar cells, and space research. The value of arsenic compounds and metal consumed domestically in 2005 was estimated to be about $7 million.

Salient Statistics—United States:	2001	2002	2003	2004	2005[e]
Imports for consumption:					
Metal	1,030	880	990	870	700
Compounds	23,900	18,800	20,800	6,150	7,500
Exports, metal	57	100	173	220	200
Estimated consumption[1]	24,900	19,600	21,600	6,800	8,000
Value, cents per pound, average:[2]					
Metal (China)	75	120	87	88	107
Trioxide (China)	42	44	45	49	41
Trioxide (Mexico)	28	33	34	32	32
Net import reliance[3] as a percentage of estimated consumption	100	100	100	100	100

Recycling: Arsenic-containing electronic components such as relays, switches, and circuit boards are disposed of at hazardous waste sites, and the metal is not reclaimed. Arsenic contained in process water at wood treatment plants was reused. Arsenic contained in gallium-arsenide scrap from the manufacture of semiconductor devices was reprocessed for arsenic recovery. No arsenic was recovered from arsenical residues and dusts at domestic nonferrous smelters.

Import Sources (2001-04): Metal: China, 81%; Japan, 15%; Hong Kong, 2%; and other, 2%. Trioxide: China, 59%; Morocco, 22%; Chile, 7%; Mexico, 5%; and other, 7%.

Tariff: Item	Number	Normal Trade Relations 12-31-05
Metal	2804.80.0000	Free.
Trioxide	2811.29.1000	Free.
Sulfide	2813.90.1000	Free.
Acid	2811.19.1000	2.3% ad val.

Depletion Allowance: 14% (Domestic and foreign).

Government Stockpile: None.

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ARSENIC

Events, Trends, and Issues: Domestic arsenic trioxide imports, mainly from China, and consumption declined drastically during 2004 owing to the voluntary decision by the wood-preserving industry to stop using CCA as a wood preservative for deck materials and outdoor residential use by yearend 2003. CCA-treated wood, which may still be sold for nonresidential application, is preferred because of lower cost and known performance. Human health concerns, increased regulation, and the use of alternative wood preservative treatments, as well as the use of concrete or plasticized wood products, will affect the long-term demand for arsenic. Global government and university research into the human health effects of arsenic in ground water and mine drainage, as well as releases of arsenic from buried World War I ammunition, Civil War-era cemeteries, and coal-burning powerplant emissions, is expected to continue. Exposure to arsenic reportedly may affect breathing and heart rhythm, and high levels of arsenic in ground water increase the risk for bladder cancer. Research continues on the use of arsenic trioxide in the treatment of leukemia.

World Production, Reserves, and Reserve Base:

	Production (arsenic trioxide)		Reserves and reserve base[4] (arsenic content)
	2004	2005[e]	
Belgium	1,000	1,000	
Chile	8,000	13,000	World reserves and reserve base are thought to be about 20 and 30 times, respectively, annual world production. The reserve base for the United States is estimated to be 80,000 tons.
China	30,000	30,000	
France	1,000	1,000	
Kazakhstan	1,500	1,000	
Mexico	1,800	2,500	
Peru	3,500	3,400	
Russia	1,500	1,500	
Other countries	1,200	1,200	
World total (rounded)	49,500	54,600	

World Resources: Arsenic is obtained from roasting arsenopyrite, the most abundant ore mineral of arsenic, and may also be obtained from copper, gold, and lead smelter flue dusts. Arsenic resources are contained in copper ores, commonly as enargite and associated alteration products, realgar and orpiment, in northern Peru and the Philippines; copper-gold ores in Chile; and gold occurrences in Canada. Global resources of copper and lead contain approximately 11 million tons of arsenic.

Substitutes: Substitutes for CCA in wood preservation include alkaline copper quaternary, ammoniacal copper quaternary, ammoniacal copper zinc arsenate, copper azole, and copper citrate. Silver-containing biocides are being considered as an alternative wood preservative treatment, especially in humid areas. Concrete, steel, plasticized wood scrap, or plastic composites may also be substituted for CCA-treated wood.

[e]Estimated.
[1]Estimated to be the same as net imports.
[2]Calculated from U.S. Census Bureau import data.
[3]Defined as imports – exports + adjustments for Government and industry stock changes.
[4]See Appendix C for definitions.