ARSENIC

(Data in metric tons of arsenic unless otherwise noted)

Domestic Production and Use: Domestic consumption of arsenic was satisfied by imported arsenic trioxide and arsenic metal because arsenic has not been produced in the United States since 1985. 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 was mainly used in compound form as arsenic trioxide, which was then mostly converted to arsenic acid for use in the production of chromated copper arsenate (CCA), a widely used preservative for pressure-treated wood products that are used outdoors. In 2003, domestic manufacturers of CCA began a voluntary transition from CCA to alternative wood preservatives in most household uses after consultations with the U.S. Environmental Protection Agency. Arsenic trioxide was also used in fertilizers, herbicides, and insecticides. Arsenic metal was used as an alloying element in ammunition and solders, as an anti-friction additive to metals used for bearings, and 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 metal and compounds consumed domestically in 2004 was estimated to be less than $5 million.

Salient Statistics—United States:	**2000**	**2001**	**2002**	**2003**	**2004[e]**
Imports for consumption:					
Metal	830	1,030	880	990	700
Compounds	23,600	23,900	18,800	20,800	4,400
Exports, metal	41	57	100	173	200
Estimated consumption[1]	24,400	24,900	19,600	21,600	4,900
Value, cents per pound, average:[2]					
Metal (China)	51	75	120	87	88
Trioxide (Mexico)	32	28	33	34	32
Net import reliance[3] as a percentage of estimated consumption	100	100	100	100	100

Recycling: Arsenic, as old scrap, was not recovered from end-use products. Arsenic, as home scrap, contained in runoff and process water at wood treatment plants, was reused in pressure treatment. 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 (2000-03): Metal: China, 78%; Japan, 16%; Hong Kong, 3%; and other, 3%. Trioxide: China, 62%; Chile, 15%; Morocco, 15%; Mexico, 4%; and other, 4%.

Tariff: Item	**Number**	**Normal Trade Relations 12-31-04**
Metal	2804.80.0000	Free.
Trioxide	2811.29.1000	Free.
Sulfide	2813.90.1000	Free.
Acid[4]	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: Long-term demand for arsenic will be affected by increased regulation because of human health concerns. Estimated arsenic consumption declined drastically in 2004 owing to regulation and the voluntary decision by the wood-preserving industry to stop using CCA as a wood preservative for outdoor residential use, especially deck materials, by yearend 2003. Research into the human health effects of arsenic in ground water, mine drainage, and coal-burning powerplant emissions will continue. Exposure to arsenic reportedly may affect breathing and heart rhythm, and increase the risk for bladder cancer. Research has been conducted on use of arsenic trioxide in the treatment of leukemia.

World Production, Reserves, and Reserve Base:

	Production (arsenic trioxide)		Reserves and reserve base[5] (arsenic content)
	2003	2004[e]	
Belgium	1,000	1,000	
Chile	8,000	8,000	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	16,000	16,500	
France	1,000	1,000	
Kazakhstan	1,500	1,500	
Mexico	2,000	2,500	
Peru	3,000	3,500	
Russia	1,500	1,500	
Other countries	1,100	2,000	
World total (rounded)	35,100	37,500	

World Resources: Global resources of copper and lead contain approximately 11 million tons of arsenic. Arsenic resources are in copper ores in northern Peru and the Philippines. Copper-gold ores in Chile also contain arsenic, and arsenic is also associated with gold occurrences in Canada.

Substitutes: Because of human health concerns and the voluntary transition from the use of CCA by the wood-preserving industry, a number of substitute products are now available. These 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. Concrete, steel, plasticized wood scrap, or plastic composites may be substituted for CCA-treated wood; however, CCA-treated wood, which may still be in stock, might be preferred because of lower cost and known performance.

[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]No tariff for Canada, Israel, Caribbean Basin countries, and designated Beneficiary Andean and developing countries.
[5]See Appendix C for definitions.