

ARSENIC

(Data in metric tons of arsenic content, unless otherwise noted)

Domestic Production and Use: Because arsenic is not recovered from domestic ores, all arsenic metal and compounds consumed in the United States are imported. More than 95% of the arsenic consumed was in compound form, principally arsenic trioxide, which was subsequently converted to arsenic acid. Production of chromated copper arsenate (CCA), a wood preservative, accounted for more than 90% of the domestic consumption of arsenic trioxide; CCA was manufactured primarily by three companies. Another company used arsenic acid to produce arsenical herbicides. Arsenic metal was consumed in the manufacture of nonferrous alloys, principally lead alloys for use in lead-acid batteries. About 15 tons per year of high-purity arsenic were estimated to have been used in the manufacture of semiconductor material. The value of arsenic metal and compounds consumed domestically in 2000 was estimated to be \$20 million.

Salient Statistics—United States:	1996	1997	1998	1999	2000^e
Production	—	—	—	—	—
Imports for consumption:					
Metal	252	909	997	1,300	1,000
Compounds	21,200	22,800	29,300	22,100	33,000
Exports, metal	36	61	177	1,350	40
Estimated consumption ¹	21,400	23,700	30,100	22,000	34,000
Value, cents per pound, average: ²					
Metal (China)	40	32	57	59	35
Trioxide (Mexico)	33	31	32	29	32
Net import reliance ³ as a percent of apparent consumption	100	100	100	100	100

Recycling: Arsenic was not recovered from consumer end-product scrap. However, process water and contaminated runoff collected at wood treatment plants were reused in pressure treatment, and gallium arsenide scrap from the manufacture of semiconductor devices was reprocessed for gallium and arsenic recovery. Domestically, no arsenic was recovered from arsenical residues and dusts at nonferrous smelters, although some of these materials are processed for recovery of other metals.

Import Sources (1996-99): Metal: China, 87%; Hong Kong, 5%; Japan, 3%; and other, 5%. Trioxide: China, 49%; Chile, 30%; Mexico, 7%; and other, 14%.

Tariff: Item	Number	Normal Trade Relations
		12/31/00
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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Events, Trends, and Issues: Wood preservatives are expected to remain the major domestic use for arsenic. As a result, the demand for arsenic in the United States should continue to correlate closely with demand for new housing and growth in the renovation or replacement of existing structures using pressure-treated lumber. In general, the demand for arsenic-based wood preservatives appears positive, barring greater acceptance of alternative preservatives or adverse regulatory activity.

Because of the toxicity of arsenic and its compounds, environmental regulation is expected to become increasingly stringent. This should adversely affect the demand for arsenic in the long term but have only minor impacts in the near term. Mitigating the pollution effects and potential health hazards of naturally occurring and anthropogenic arsenic should continue as important research areas.

World Production, Reserves, and Reserve Base:

	Production (Arsenic trioxide)		Reserves and reserve base⁵ (Arsenic content)
	1999	2000^e	
Belgium	1,500	1,500	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.
Chile	8,000	8,000	
China	16,000	16,000	
France	1,000	1,000	
Ghana	5,000	5,000	
Kazakhstan	1,500	2,000	
Mexico	2,500	3,000	
Russia	1,500	1,500	
Other countries	<u>1,800</u>	<u>2,000</u>	
World total	38,800	40,000	

World Resources: World resources of copper and lead contain about 11 million tons of arsenic. Substantial resources of arsenic occur in copper ores in northern Peru and the Philippines and in copper-gold ores in Chile. In addition, world gold resources, particularly in Canada, contain substantial resources of arsenic.

Substitutes: Substitutes for arsenic compounds exist in most of its major uses, although arsenic compounds may be preferred because of lower cost and superior performance. The wood preservatives pentachlorophenol and creosote may be substituted for CCA when odor and paintability are not problems and where permitted by local regulations. Ammoniacal copper quaternary, copper azole, copper citrate, and copper dimethyldithiocarbamate are some of the alternative wood preservatives available which use no arsenic. Nonwood alternatives, such as concrete, steel, or plastic lumber, may be substituted in some applications for treated wood.

^eEstimated.

¹Estimated to be the same as net imports.

²Calculated from U.S. Census Bureau import data.

³Defined as imports - exports + adjustments for Government and industry stock changes.

⁴Tariff is free for Canada, Israel, Caribbean Basin countries, and designated Beneficiary Andean and developing countries.

⁵See Appendix C for definitions.