ARSENIC

(Data in metric tons, unless otherwise noted)

Domestic Production and Use: Arsenic was not recovered from domestic ores; all arsenic metal and compounds consumed in the United States were imported. It is estimated that domestic arsenic consumption ranged between 20,000 and 25,000 tons annually. More than 95% of the arsenic consumed was in compound form, principally arsenic trioxide, which is subsequently converted to arsenic acid. Production of chromated copper arsenate (CCA), a wood preservative, accounts for more than 90% of the domestic consumption of arsenic trioxide. CCA is manufactured primarily by three companies. Another company used arsenic acid to produce arsenical herbicides. Arsenic metal is consumed in the manufacture of nonferrous alloys, principally lead alloys for use in lead-acid batteries. It is estimated that about 15 tons of high-purity arsenic is used in the manufacture of semiconductor material. The value of arsenic metal and compounds consumed domestically was estimated at $20 million.

Salient Statistics—United States:	1993	1994	1995	1996	1997[e]
Imports for consumption:					
Metal	767	1,330	557	252	1,200
Trioxide[1]	27,500	26,800	29,000	28,000	30,000
Arsenic acid	—	5	([2])	1	1
Exports, metal	364	79	430	36	90
Price, cents per pound, average:[3]					
Metal, Chinese	44	40	66	40	30
Trioxide, total	26	26	24	22	21
Net import reliance[4] as a percent of apparent consumption	100	100	100	100	100

Recycling: Process water and contaminated runoff collected at wood treatment plants are reused in pressure treatment. Gallium arsenide scrap from the manufacture of semiconductor devices is reprocessed for gallium and arsenic recovery. Domestically, no arsenic is recovered from arsenical residues and dusts at nonferrous smelters, although some of these materials are processed for recovery of other metals.

Import Sources (1993-96): Metal: China, 88%; Japan, 5%; Hong Kong, 4%; and other, 3%. Trioxide: China, 48%; Chile, 20%; Mexico, 12%; and other, 20%.

Tariff: Item	Number	Most favored nation (MFN) 12/31/97	Non-MFN[5] 12/31/97
Metal	2804.80.0000	Free	13.2¢/kg.
Trioxide	2811.29.1000	Free	Free.
Sulfide	2813.90.1000	Free	Free.
Acid[6]	2811.19.1000	2.3% ad val.	4.9% ad val.

Depletion Allowance: 14% (Domestic), 14% (Foreign).

Government Stockpile: None.

Prepared by **Robert G. Reese, Jr., (703) 648-4981 [Fax: (703) 648-7757].**

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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 the demand for new housing, and the 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.

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.

World Production, Reserves, and Reserve Base:

	Production (Arsenic trioxide)		Reserves and reserve base[7] (Arsenic content)
	1996	1997[e]	
United States	—	—	
Belgium	2,000	2,000	
Chile	9,000	9,000	World reserves and reserve base are thought to be about 20 and 30 times, respectively, annual world production.
China	15,000	15,000	
France	3,000	3,000	
Kazakstan	1,500	1,500	
Mexico	4,300	4,400	
Namibia	1,100	2,000	
Philippines	2,000	2,000	
Russia	1,500	1,500	
Other countries	2,700	3,000	
World total (rounded)	42,000	43,000	

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. A recently developed alternative, ammoniacal copper quaternary, which avoids using chrome and arsenic, has yet to gain widespread usage. Nonwood alternatives, such as concrete, steel, or plastic lumber, may be substituted in some applications for treated wood.

[e]Estimated.

[1]Arsenic trioxide (As_2O_3) contains 75.7% arsenic by weight.

[2]Less than ½ unit.

[3]Calculated from Bureau of the Census import data.

[4]Defined as imports - exports + adjustments for Government and industry stock changes.

[5]See Appendix B.

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

[7]See Appendix D for definitions. The reserve base for the United States was estimated at 80,000 tons.