

IODINE

(Data in thousand kilograms, elemental iodine, unless otherwise noted)

Domestic Production and Use: Iodine produced in 1999 from three companies operating in Oklahoma accounted for 100% of the elemental iodine value estimated at \$25 million. The operation at Woodward, OK, continued production of iodine from subterranean brines. A second company operated a miniplant in Kingfisher County, OK, using waste brine associated with oil and a plant in Woodard, OK. A third company continued production at Vici, OK, for domestic use and export to Germany. Of the consumers that participate in the annual survey, 23 plants reported consumption of iodine in 1998. Major consumers were located in the Eastern United States. Prices of crude iodine in drums, published for November, ranged between \$19 and \$21 per kilogram. Imports of iodine through July averaged \$16.77 per kilogram.

Establishing an accurate end-use pattern for iodine was difficult because intermediate iodine compounds were marketed before reaching their final end uses. The downstream uses of iodine were in animal feed supplements, catalysts, inks and colorants, pharmaceuticals, photographic equipment, sanitary and industrial disinfectants, stabilizers, and other.

Salient Statistics—United States:	1995	1996	1997	1998	1999^e
Production	1,220	1,270	1,320	1,490	1,630
Imports for consumption, crude content	3,950	4,860	6,380	5,960	6,000
Exports	1,220	2,410	2,760	2,790	2,800
Shipments from Government stockpile excesses	133	—	204	291	221
Consumption:					
Apparent	3,540	3,700	5,140	4,950	5,050
Reported	3,680	3,920	4,500	4,100	NA
Price, average c.i.f. value, dollars per kilogram, crude	9.88	12.90	14.66	16.45	16.77
Stocks, producer, yearend	NA	NA	NA	NA	NA
Employment, number	35	40	40	40	40
Net import reliance ¹ as a percent of apparent consumption	90	66	65	70	68

Recycling: Small amounts of iodine were recycled, but no data are reported.

Import Sources (1995-98): Chile, 60%; Japan, 31%; Russia, 9%; and other, 1%.

Tariff:	Item	Number	Normal Trade Relations
			12/31/99
	Iodine, crude	2801.20.0000	Free.
	Iodide, calcium or of copper	2827.60.1000	Free.
	Iodide, potassium	2827.60.2000	2.8% ad val.
	Iodides and iodide oxides, other	2827.60.5000	4.2% ad val.

Depletion Allowance: 5% on brine wells (Domestic and foreign); 15% on solid minerals (Domestic and foreign).

Government Stockpile: On March 3, the Defense National Stockpile Center (DNSC) announced approximately 40,800 kilograms (90,000 pounds) of crude iodine was awarded under Solicitation of Offers DLA-Iodine-003 to one company for an approximate value of \$700,000 (\$17.15 per kilogram). On June 10, DNSC awarded approximately 34,900 kilograms (77,000 pounds) of crude iodine to two companies for an approximate value of \$540,000 or \$15.46 per kilogram. On September 1, DNSC announced the award of approximately 2,300 kilograms (5,000 pounds) of crude iodine to one company for \$35,000 or \$15.43 per kilogram. The Solicitation of Offers for Iodine, DLA-Iodine-003, was amended on July 23. The DNSC announced that, as of September 30, 1999, uncommitted inventory was 3,944,359 pounds. On October 29, the DNSC amended the solicitation to 454,000 kilograms (1,000,000 pounds) for fiscal year 2000 with quarterly sales of 113,000 kilograms (250,000 pounds).

Stockpile Status—9-30-99²

Material	Uncommitted inventory	Committed inventory	Authorized for disposal	Disposal plan FY 1999	Disposals FY 1999
Stockpile-grade	1,789	65	1,789	454	102

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Events, Trends, and Issues: Chile was the largest producer of iodine in the world. Japan was the second largest producer of iodine in the world. Production was primarily from underground brines associated with natural gas production. Six companies operated 17 plants with a total capacity of 9,000 tons per year. Production capacity of the plants was dependent upon the availability of brines with high iodine concentrations.

A Canadian company's iodine project in Chile that began production in January was sold to another Canadian company interested in potassium and sodium nitrate in July.

Iodine continued to be used in photographic films as digital photography closed the year at about 10% of the market. A U.S. company received Food and Drug Administration approval and began marketing an antibacterial toothpaste that used iodine.

World Mine Production, Reserves, and Reserve Base:

	Mine production		Reserves ³	Reserve base ³
	1998	1999 ^e		
United States	1,490	1,630	550,000	550,000
Azerbaijan	300	300	170,000	NA
Chile	12,618	8,000	900,000	1,200,000
China	500	500	400,000	400,000
Indonesia	70	70	100,000	100,000
Japan	6,000	6,000	4,000,000	7,000,000
Russia	120	120	NA	NA
Turkmenistan	250	250	170,000	NA
World total (rounded)	21,300	16,900	⁴ 6,300,000	NA

World Resources: In addition to the fields listed in the reserve base, seawater contains 0.05 part per million iodine, or approximately 76 billion pounds. Seaweeds of the Laminaria family are able to extract and accumulate up to 0.45% iodine on a dry basis. Although not as economical as the production of iodine as a byproduct of gas, oil, and nitrate, the seaweed industry represented a major source of iodine prior to 1959 and is a large resource.

Substitutes: Bromine and chlorine could be substituted for most of the biocide, ink, and colorant uses of iodine, although they are usually considered less desirable than iodine. Antibiotics and mercurochrome also substitute for iodine as biocides. Salt crystals and finely divided carbon may be used for cloud seeding. There are no substitutes in some catalytic, nutritional, pharmaceutical, animal feed, and photographic uses.

^eEstimated. NA Not available.

¹Defined as imports - exports + adjustments for Government and industry stock changes.

²See Appendix B for definitions.

³See Appendix C for definitions.

⁴Sum excludes countries for which data are not available.