

IODINE

(Data in metric tons elemental iodine unless otherwise noted)

Domestic Production and Use: Iodine was produced in 2007 by three companies operating in Oklahoma. Production increased slightly in 2007. 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. A third company continued production at Vici, OK. Prices for iodine have increased in recent years owing to high demand and high capacity utilization. The average c.i.f. value of iodine imports was estimated to be \$20.63 per kilogram. Establishing an accurate end-use pattern for iodine was difficult because intermediate iodine compounds were marketed before reaching their final end uses. Of the consumers that participate in an annual USGS canvass, 22 plants reported consumption of iodine in 2006. Iodine compounds reported used were unspecified organic compounds, including ethyl and methyl iodide, 38%; crude iodine, 13%; povidine-iodine (iodophors), 10%; sodium iodide, 10%; potassium iodide, 9%; ethylenediamine dihydroiodide, 4%; and other, 16%. Estimated world consumption of iodine was 26,800 tons.

Salient Statistics—United States:	2003	2004	2005	2006	2007^e
Production	1,090	1,130	1,570	W	W
Imports for consumption, crude content	5,750	5,700	6,250	5,640	6,770
Exports	1,590	1,270	2,660	2,020	2,970
Shipments from Government stockpile excesses	361	245	444	467	93
Consumption:					
Apparent	5,610	5,810	5,600	W	W
Reported	3,930	4,070	4,680	4,570	4,600
Price, average c.i.f. value, dollars per kilogram, crude	11.81	13.38	16.75	19.34	20.63
Employment, number	30	30	30	30	30
Net import reliance ¹ as a percentage of apparent consumption	81	81	72	W	W

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

Import Sources (2003-06): Chile, 73%; Japan, 26%; and other, 1%.

Tariff:	Item	Number	Normal Trade Relations 12-31-07
	Iodine, crude	2801.20.0000	Free.
	Iodide, calcium or copper	2827.60.1000	Free.
	Iodide, potassium	2827.60.2000	2.8% ad val.
	Iodides and iodide oxides, other	2827.60.5100	4.2% ad val.

Depletion Allowance: 14% (Domestic and foreign).

Government Stockpile: In October, the Defense National Stockpile Center announced that the fiscal year 2008 Annual Materials Plan would include sales of 454 tons (1,000,000 pounds) of crude iodine, which would deplete the existing stockpile.

Stockpile Status—9-30-07²

Material	Uncommitted inventory	Committed inventory	Authorized for disposal	Disposal plan FY 2007	Disposals FY 2007
Stockpile-grade	3	—	3	454	208

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Events, Trends, and Issues: Chile was the leading producer of iodine in the world. Iodine was a coproduct from surface mineral deposits used to produce nitrate fertilizer. Two of the leading iodine companies in the world were located in Chile. Japan was the second leading producer; its production was associated with gas brines.

A leading producer of iodine in Chile continued construction of a mechanical agitated leach plant. The plant was expected to be operational in the first quarter of 2008. With completion of the plant, the company expected iodine production to increase to 1,500 tons per year from 900 tons per year. The company also was building a powerline to connect the plant to a local power grid, replacing its diesel-powered generator system.

Another Chilean producer announced plans to expand iodine production in its northern Chile deposits to 6,000 tons per year from 1,800 tons per year over the 25-year lifespan of the \$15 million project.

The Turkmenistan Government merged its fertilizer and iodine producers into one state organization. The objective of the merger was to stimulate further development of the chemical industry.

In October, the U.S. Environmental Protection Agency (EPA) approved the use of methyl iodide (iodomethane), an agricultural fumigant, for a 1-year trial. Iodomethane would be injected into the soil to kill insects and weeds prior to planting crops such as peppers, strawberries, and tomatoes. The compound was developed to replace methyl bromide, which contributes to degradation of the ozone layer. EPA concluded that iodomethane is safe to use if strict registration and risk mitigation guidelines are followed.

Governments continued to be concerned about iodine deficiencies in children throughout the world. An estimated 35% of children in developing countries suffer from iodine deficiency. Iodine deficiencies can result in goiter and mental impairment. This has prompted several countries to pass laws requiring universal salt iodization, and in parts of China, to subsidize iodized salt use.

World Mine Production, Reserves, and Reserve Base:

	Mine production		Reserves ³	Reserve base ³
	2006	2007 ^e		
United States	W	W	250,000	550,000
Azerbaijan	300	300	170,000	340,000
Chile	15,500	16,500	9,000,000	18,000,000
China	560	570	4,000	120,000
Indonesia	75	75	100,000	200,000
Japan	8,000	8,800	4,900,000	7,000,000
Russia	300	300	120,000	240,000
Turkmenistan	270	270	170,000	350,000
Uzbekistan	2	2	NA	NA
World total (rounded)	⁴ 25,000	⁴ 26,800	15,000,000	27,000,000

World Resources: In addition to the reserve base shown above, seawater contains 0.05 part per million iodine, or approximately 34 million tons. 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, nitrate, and oil, the seaweed industry represented a major source of iodine prior to 1959 and remains a large resource.

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

^eEstimated. NA Not available. W Withheld to avoid disclosing company proprietary data.

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

²See Appendix B for definitions.

³See Appendix C for definitions.

⁴Excludes U.S. production.