

IODINE

(Data in metric tons elemental iodine unless otherwise noted)

Domestic Production and Use: A slight increase in production of iodine was expected in 2009 compared with that of 2008. Iodine was produced in 2009 by three companies operating in Oklahoma, with a fourth company anticipating initial iodine production in Montana by late 2009. The operation at Woodward, OK, continued production of iodine from subterranean brines. Another company continued production at Vici, OK. Prices for iodine have increased in recent years owing to high demand, which has led to high-capacity utilization. The average c.i.f. value of iodine imports in 2009 was estimated to be \$21.10 per kilogram.

Domestic and imported iodine were used to produce many intermediate iodine compounds by downstream manufactures, making it difficult to establish an accurate end-use pattern. Of the consumers that participate in an annual U.S. Geological Survey canvass, 19 plants reported consumption of iodine in 2008. Iodine and iodine compounds reported used were unspecified organic compounds, including ethyl and methyl iodide, 45%; crude iodine, 15%; povidine-iodine (iodophors), 10%; potassium iodide, 9%; ethylenediamine dihydroiodide, 5%; sodium iodide, 2%; and other, 14%.

Salient Statistics—United States:	2005	2006	2007	2008	2009^e
Production	1,570	W	W	W	W
Imports for consumption, crude content	6,250	5,640	6,060	6,300	5,600
Exports ¹	2,430	1,580	1,060	950	1,200
Shipments from Government stockpile excesses	444	467	93	—	—
Consumption:					
Apparent	5,600	W	W	W	W
Reported	4,680	4,570	4,470	4,590	4,400
Price, average c.i.f. value, dollars per kilogram, crude	16.75	19.34	21.01	21.52	21.10
Employment, number ^e	30	30	30	30	30
Net import reliance ² as a percentage of apparent consumption	72	W	W	W	W

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

Import Sources (2005-08): Chile, 80%; Japan, 19%; and other, 1%.

Tariff:	Item	Number	Normal Trade Relations
			12-31-09
	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: None.

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Events, Trends, and Issues: Chile was the leading iodine-producing country, followed by Japan and the United States. Chile accounted for more than 50% of world production, with two of the leading iodine producers in the world in Chile. A large portion of Chilean iodine was produced as a byproduct or coproduct of nitrates. Japanese iodine was extracted from underground natural gas brines.

A leading Chilean iodine producer announced a \$1 billion capital expansion plan to be executed from 2008 to 2010, which includes increasing capacity of its iodine and nitrate facilities by 25% by 2012. Another Chilean iodine producer completed construction of a new agitated leach plant to replace a heap leaching system. The new plant was expected to increase iodine recovery by over 25% and cut leaching time from 1 month to 24 hours. As a result, iodine production was expected to increase by 50%.

The Turkmenistan Government continued to invest significantly in repairing and upgrading production facilities to achieve its anticipated goal of 1,800 tons of iodine per year by 2010. A company in Azerbaijan continued expansion of its iodine plant supported by a \$15 million loan from the European Bank of Reconstruction. The expansion, including the purchase of new equipment, addition of a new product line, and repair of extraction wells, would result in an expected production rate increase to 10,000 tons of iodine per year.

Demand for iodine in applications such as biocides, iodine salts, liquid crystal displays (LCD), synthetic fabric treatments, and x-ray contrast media are expected to increase at a rate of 3.5% to 4% per year over the next decade. The use of methyl iodide as a soil fumigant, although currently undergoing a trial period, may become a viable alternative to methyl bromide, which has proven to cause irreparable environmental damage. Global shipments of LCD televisions were expected to double by 2012, resulting in an anticipated increase in consumption of iodine by LCD producers. As more countries implement legislation mandating salt iodization to combat iodine deficiency, the global demand for iodized salt would be expected to increase. China's Ministry of Health, on the other hand, announced the reduction of iodine content in salt for specific provinces owing to fears iodized salt may be causing a rise in thyroid diseases in those provinces. The implementation of this program was expected to take place by the first half of 2010.

World Mine Production and Reserves:

	Mine production		Reserves ³
	2008	2009 ^e	
United States	W	W	250,000
Azerbaijan	300	300	170,000
Chile	15,500	16,000	9,000,000
China	570	580	4,000
Indonesia	75	75	100,000
Japan	9,500	9,300	4,900,000
Russia	300	300	120,000
Turkmenistan	270	300	170,000
Uzbekistan	2	2	NA
World total (rounded)	⁴ 26,500	⁴ 27,000	15,000,000

World Resources: In addition to the reserves shown above, seawater contains 0.05 parts 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. — Zero.

¹Export data for the years 2005-06 were revised by the U.S. Census Bureau.

²Defined as imports – exports + adjustments for Government and industry stock changes.

³See [Appendix C for definitions](#). Reserve base estimates were discontinued in 2009; see [Introduction](#).

⁴Excludes U.S. production.