

BROMINE

(Data in metric tons of bromine content unless otherwise noted)

Domestic Production and Use: Bromine was recovered from underground brines by two companies in Arkansas. Bromine often is the leading mineral commodity, in terms of value, produced in Arkansas. The two bromine companies in the United States account for a large percentage of world production capacity.

The leading global applications of bromine are for the production of brominated flame retardants, and intermediates and industrial uses. Bromine compounds are also used in a variety of other applications, including drilling fluids and industrial water treatment. U.S. apparent consumption of bromine in 2018 was estimated to be greater than that in 2017.

Salient Statistics—United States:	2014	2015	2016	2017	2018^e
Production	W	W	W	W	W
Imports for consumption, elemental bromine and compounds ¹	59,400	61,200	58,400	52,700	59,700
Exports, elemental bromine and compounds ²	31,500	29,600	28,200	43,400	34,400
Consumption, apparent ³	W	W	W	W	W
Employment, number ^e	1,050	1,050	1,050	1,050	1,050
Net import reliance ⁴ as a percentage of apparent consumption	<25	<25	<25	<25	<25

Recycling: Some bromide solutions were recycled to obtain elemental bromine and to prevent the solutions from being disposed of as hazardous waste. Hydrogen bromide is emitted as a byproduct in many organic reactions. This byproduct waste can be recycled with virgin bromine brines and used as a source of bromine production. Bromine contained in plastics can be incinerated as solid organic waste, and the bromine can be recovered.

Import Sources (2014–17):⁵ Israel, 82%; Jordan, 8%; China, 7%; and other, 3%.

Tariff: Item	Number	Normal Trade Relations 12–31–18
Bromine	2801.30.2000	5.5% ad val.
Hydrobromic acid	2811.19.3000	Free.
Potassium or sodium bromide	2827.51.0000	Free.
Ammonium, calcium, or zinc bromide	2827.59.2500	Free.
Potassium bromate	2829.90.0500	Free.
Sodium bromate	2829.90.2500	Free.
Ethylene dibromide	2903.31.0000	5.4% ad val.
Methyl bromide	2903.39.1520	Free.
Dibromoneopentyl glycol	2905.59.3000	Free.
Tetrabromobisphenol A	2908.19.2500	5.5% ad val.
Decabromodiphenyl and octabromodiphenyl oxide	2909.30.0700	5.5% ad val.

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Depletion Allowance: Brine wells, 5% (Domestic and foreign).

Government Stockpile: None.

Events, Trends, and Issues: The United States maintained its position as one of the leading bromine producers in the world. China, Israel, and Jordan also are major producers of elemental bromine. In 2018, U.S. imports of bromine and bromine compounds increased, whereas exports decreased.

Global consumption of brominated flame retardants, particularly in the automotive, construction, and electronics industries, was stable in 2018. The amount of clear brine fluids consumed in the oil-well and gas-well drilling industries continued to mirror global changes in oil prices and the number of active drilling rigs.

Bromine facilities in Shandong Province, China, remained closed in the first half of 2018 while rectifications and improvements were completed to meet new environmental regulations initiated by the Government of China in late 2017. The price of elemental bromine in China remained high in 2018, as a result of decreased bromine supply owing to the new environmental guidelines.

World Production and Reserves:

	Production		Reserves ⁶
	2017	2018 ^e	
United States	W	W	11,000,000
Azerbaijan	—	—	300,000
China	81,700	60,000	NA
India	1,700	1,700	NA
Israel	180,000	190,000	Large
Japan	20,000	20,000	NA
Jordan	100,000	100,000	Large
Ukraine	4,900	4,900	NA
World total (rounded)	7388,000	7380,000	Large

World Resources: Bromine is found principally in seawater, evaporitic (salt) lakes, and underground brines associated with petroleum deposits. The Dead Sea, in the Middle East, is estimated to contain 1 billion tons of bromine. Seawater contains about 65 parts per million of bromine, or an estimated 100 trillion tons. Bromine is also recovered from seawater as a coproduct during evaporation to produce salt.

Substitutes: Chlorine and iodine may be substituted for bromine in a few chemical reactions and for sanitation purposes. There are no comparable substitutes for bromine in various oil-well and gas-well completion and packer applications. Because plastics have a low ignition temperature, aluminum hydroxide, magnesium hydroxide, organic chlorine compounds, and phosphorus compounds can be substituted for bromine as fire retardants in some uses.

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

¹Imports calculated from items shown in Tariff section.

²Exports calculated from Schedule B numbers 2801.30.2000, 2827.51.0000, 2827.59.0000, 2903.31.0000, and 2903.39.1520.

³Defined as production (sold or used) + imports – exports.

⁴Defined as imports – exports.

⁵Calculated using the gross weight of imports.

⁶See Appendix C for resource and reserve definitions and information concerning data sources.

⁷Excludes U.S. production.