

35
Br
Bromine
79.904

Key Properties

Atomic Mass	79.904
Category	Halogens
State at 20°C	liquid
Melting Point	-7.2°C
Boiling Point	58.8°C
Density	3.12
Electron Config	[Ar] 3d104s24p5
Electronegativity	2.96
Year Discovered	1826
Discovered By	Antoine Jérôme Balard

Did You Know?

- 1 It is one of only two elements on the periodic table that are liquid at room temperature (the other is mercury).
- 2 Its name comes from the ancient Greek word 'brómos', which means 'stench', because of its strong, bleach-like, unpleasant odor.
- 3 Bromine is a dark, reddish-brown liquid that readily evaporates into a similarly colored gas.
- 4 It is found naturally in seawater and brine pools, from which it is commercially extracted.
- 5 Bromine compounds are widely used as flame retardants in plastics and textiles.

APPEARANCE

Bromine is a dense, reddish-brown, volatile liquid.

SUPERHERO PERSONA

"The Stench, a fuming liquid hero who is one of only two liquid elements at room temperature."

EVERYDAY CONNECTION

Bromine is found as an ingredient in flame retardants used in plastics and furniture.

POP CULTURE

Bromine was once used in old science fiction to represent toxic alien seas.

Overview of Bromine

Bromine is a deep-red, oily liquid with a sharp odor. A member of the halogen group, it is highly reactive and toxic. Alongside mercury, bromine is one of only two elements that exist as liquids at room temperature. Its reactivity has made it important in chemical manufacturing, flame retardants, and specialized applications, though health and environmental concerns have limited some of its uses.

Uses of Bromine

Bromine compounds are employed across industries, though several uses are being phased out due to toxicity:

Flame retardants: Brominated compounds are added to plastics, textiles, and electronics to reduce flammability, though environmental concerns have restricted their use in some countries.

Fire suppression systems: Organobromides are used in halon fire extinguishers, effective in enclosed spaces like aircraft and museums where water could cause damage.

Photography: Silver bromide (AgBr) was once central to traditional film photography because of its light sensitivity.

Chemical intermediates: Bromine is used in producing dyes, insecticides, agricultural chemicals, and pharmaceuticals.

Natural Occurrence and Production of Bromine

Bromine is found in salt brines and seawater, where it occurs as bromide ions. Today, most bromine is extracted by electrolysis of concentrated brines, with major production in the United States, Israel, and China. The Dead Sea remains one of the richest commercial sources, due to its high bromide concentration.

History of Bromine

1825–1826 – Discovery: French chemist Antoine-Jérôme Balard isolated bromine by passing chlorine gas through concentrated brine from a salt marsh, producing the distinct orange-red liquid.

Earlier work: German student Carl Löwig had isolated bromine in 1825 but was unable to publish before Balard, so official credit went to Balard.

Biological Role of Bromine

Bromine has no essential biological role in humans. It is toxic and irritating to the skin, eyes, and respiratory tract. However, bromide ions are naturally present in trace amounts in living organisms, including humans.