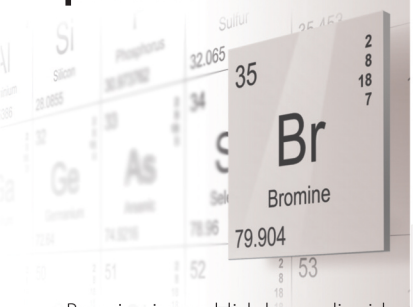
35 Bromine & Fire Safety

Bromine's symbol is Br

It is part of the halogen group of the periodic table.



Bromine is a reddish brown liquid. It is never naturally found in its elemental form but in inorganic compounds, known also as bromides, and in natural bromo-organic compounds*. These are found in

soils, salts, air and sea water.

"Without bromine, there are no animals"

Billy Hudson
Ph.D - Vanderbilt University

A 2014 study** showed that bromine is part of the 28 elements that are essential to human life. It enables tissue development in all animals including humans.

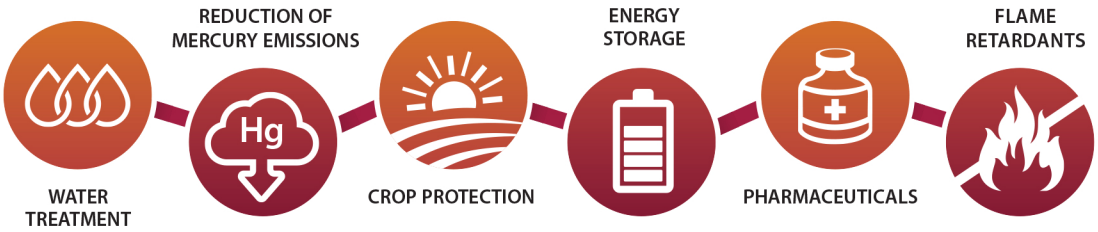
Bromine was discovered by the French scientist

Antoine Balard in 1826

while he was studying salt marsh flora from Mediterranean waters in France. He crystallized the salts and saturated the remaining liquid with chlorine. What was left behind after distillation was a dark red liquid: bromine.

APPLICATIONS

Since bromine was discovered, various bromine compounds have been used in important fields such as



Focus

BROMINE AND FIRE SAFETY

Flame retardants are used to reduce fire risks in all sorts of materials susceptible to burn.

We live in a modern society where we are surrounded by products made out of flammable materials, such as oil-based plastics and synthetics.

Flame retardants are substances commonly used in many domestic and industrial appliances and places to prevent fires such as in planes, theatres, computers, TVs.

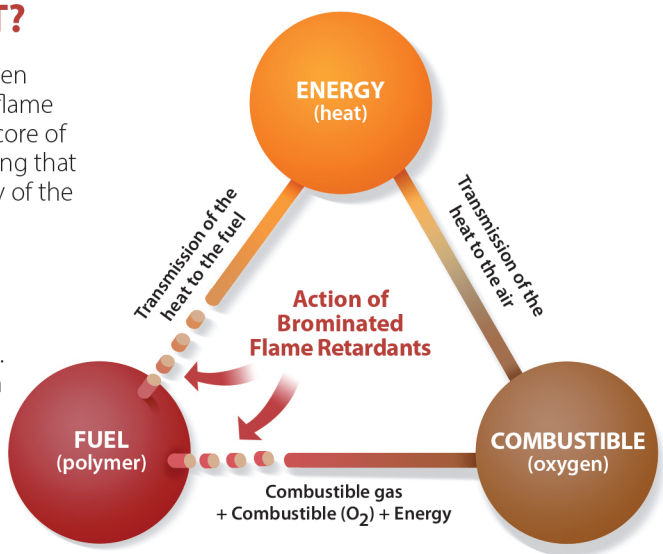
The type of flame retardant used depends on the material, but also on the degree of fire safety needed.

Brominated flame retardants increase a product's fire safety. They make ignition more difficult and slow down the spread of fire allowing people to escape and making fire-fighters' intervention easier.

WHY IS BROMINE EFFECTIVE AS A FLAME RETARDANT?

Fire is a chemical reaction between oxygen and a fuel in the gas phase. Brominated flame retardants act directly on the flame, the core of the fire. They act in the gas phase, meaning that they actually interfere with the chemistry of the flame.

Brominated flame retardants have the ability to release active bromine atoms (called free radicals) into the gas phase, as the material is decomposed in the fire. These bromine atoms effectively quench the chemical reactions occurring in the flame, reducing the heat generated and slowing down or even preventing the burning process.



* Gordon W. Gribble, The diversity of naturally occurring organobromine compounds, Chemical Society Reviews, 1999, link

** Billy G. Hudson, et al. Bromine is an essential trace element for assembly of collagen IV scaffolds in tissue development and architecture. Cell, 2014; vol. 157, link

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