



[www.albemarle.com](http://www.albemarle.com)



## Product Stewardship Summary

CAS: 10035-10-6  
Formula: HBr

# Hydrobromic Acid, Anhydrous; Anhydrous Hydrogen Bromide

### Table of Contents

*Click a heading to display that topic.*

- [Introduction](#)
- [Description and Properties](#)
- [Uses](#)
- [Health Information](#)
- [Exposure Potential](#)
- [Environmental Information](#)
- [Physical Hazards](#)
- [Derivation/Manufacturing](#)
- [Regulatory Information](#)
- [Product Stewardship](#)
- [Conclusion](#)
- [References](#)

### Introduction

Anhydrous hydrobromic acid (HBr) is a powerful chemical compound that is an essential chemical tool in modern manufacturing. Hundreds of other compounds made with HBr are combined in a variety of ways to make such things as semiconductors, fuels, plastics and medicines. HBr is literally a life-saver:

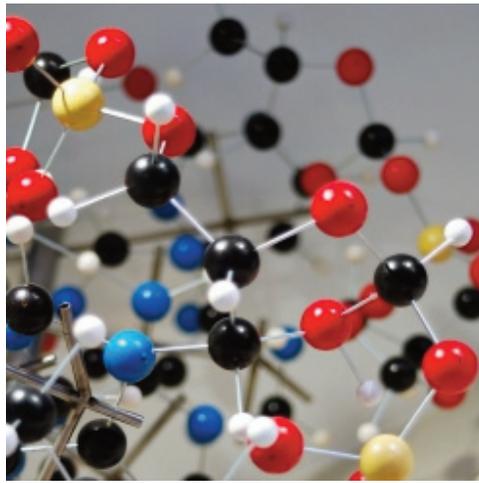
It is used to make the fire retardants that protect us in our homes and automobiles, and when we travel by air.

HBr does all these things and more by combining with other products and by controlling chemical reactions, so we can't see it at work. But without it, our lives would be much less comfortable and considerably less safe.

### Description and Properties

Anhydrous hydrobromic acid is a colorless gas that is heavier than air and has a great affinity for water. It has a sharp, unpleasant odor, it fumes in moist air, and the resulting clouds have a strong, sour taste. HBr dissolves in alcohol and organic solvents, as well as water. It is nonflammable, but is highly corrosive to

most metals in the presence of even very small amounts of moisture.



### Uses

Anhydrous hydrobromic acid reacts readily with a wide variety of chemical compounds, and this ability

makes it a valuable chemical tool in drug manufacturing, both as an ingredient and as a catalyst that helps to control complex reactions.

HBr is very effective at etching the silicon wafers used in semiconductor production. Our homes, appliances, entertainment systems and automobiles contain miniaturized electronic components and integrated circuits that are made in a complex process using HBr to remove unwanted material. HBr is used in engraving and a type of printing called lithography, and is a key ingredient in the manufacture of photographic chemicals and textile finishing.

Oil refiners sometimes use anhydrous hydrobromic acid with other compounds to help them make ingredients for high-octane gasoline and aviation fuel, as well as intermediate compounds that are used to make plastics, cosmetics and synthetic fibers.

One of HBr's most important roles is to help protect us from fire. It is a key ingredient used to make many fire retardants that are added to fabrics, plastics and plastic foam. These fire retardants are critical to public safety and are required by law in the seat cushions we use at home, in our cars and when we travel by air. Fire retardants made with HBr also protect your computer and television, your carpet and draperies, your furniture at home and at work, and many types of clothing.

### Health Information

Anhydrous hydrobromic acid causes severe burns to the eyes, skin, and mucous membranes in the mouth, throat and nose. Exposure to high concentrations can cause

death from swelling or spasm of the throat, or from respiratory inflammation. Long-term exposure may cause chronic nasal and bronchial discharge and chronic indigestion. Inhalation of vapors may cause coughing, nose bleeds, dizziness, headache, delayed abdominal pain and diarrhea.

### Exposure Potential

You are very unlikely to be exposed to hydrobromic acid even if you work in a manufacturing process that uses it or you're involved in transporting HBr. Exposure is unlikely because HBr is stored and transported in durable protective containers designed to prevent contact

with the material, and because ventilation and personal protective equipment are required when handling HBr.

In the event of a spill or accidental release, HBr will form a corrosive liquid when it comes into contact with water. To avoid contact, move quickly away from the spill and get upwind. If you must work where the potential exists for exposure, your employer will require that you wear a complete acid suit with hood, gloves, boots, and full-facepiece acid gas respirator, supplied-air respirator, or self-contained breathing apparatus.

### Environmental Information

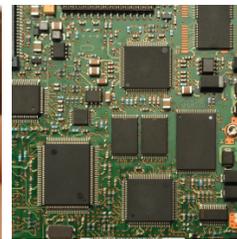
Small quantities of hydrogen bromide are sometimes released naturally during volcanic eruptions. Whether or not HBr is released into the environment by natural processes, its affinity for water and tendency to react with other compounds mean that it is unlikely to persist in the environment for extended periods.

### Physical Hazards

Hydrogen bromide is stored and transported in specialized containers made with compatible materials and designed to prevent unintentional releases. If the containers are subjected to a fire, they may burst, releasing HBr and toxic bromine gas. At sufficiently high pressure, HBr can weaken glass laboratory containers, which may shatter.

If containers are punctured, HBr may come into contact with common metals, producing hydrogen gas, which is

explosive. Leaking HBr becomes highly corrosive in the presence of moisture, and it can react with a variety of other compounds to produce heat and toxic or corrosive smoke and fumes.



### Derivation/Manufacturing

Anhydrous hydrogen bromide is made in Europe, Asia and the Americas. Albemarle Corporation makes HBr in its Magnolia, Arkansas, manufacturing complex and at its Jordan Bromine Company joint venture facility in Safi, Jordan.

## Regulatory Information

HBr is regulated under CERCLA/RCRA regulations as a hazardous waste or material. If spilled, it can be neutralized so that it is no longer corrosive, and it may then be disposed of as a non-hazardous waste in compliance with local, state and federal regulations.

Anhydrous HBr is classified by the US Department of Transportation as a toxic gas, and as a corrosive compound (DOT HAZARD CLASS: 2.3 (Toxic Gas) See Note 3., 8 (corrosive) DOT ID NUMBER: UN1048). It is a class 1 “immediate-acute” health hazard under SARA 311/312 regulations.

The OSHA-permissible exposure limit (PEL) for hydrogen bromide is 3 ppm (10 mg/m<sup>3</sup>) as an 8-hour time-weighted average concentration. Based on the potential for eye, mucous membrane, and skin irritation, the National Institute for Occupational Safety and Health (NIOSH) exposure limit for hydrogen bromide is 3 ppm as a ceiling limit. The American Conference of Governmental Industrial Hygienists (ACGIH) has a ceiling limit of 2 ppm.

HBr has been pre-registered under the European Community Regulation “REACH”.

## Product Stewardship

Albemarle Corporation is committed to manage hydrogen bromide so that it can be safely distributed and used. We work with our customers to minimize the risks of leakage and personnel exposure through compliance with applicable regulations. Those regulations specify appropriate containers and protective equipment, and require transportation firms to meet strict safety standards before transporting the product.

In the unlikely event of an HBr transportation incident, Albemarle is staffed and organized to document and investigate, and facilitate corrective action. In addition, we provide guidance to our customers in proper handling and storage techniques and systems, along with emergency response procedures, and we encourage communication about safety and improved procedures.



## Conclusion

Anhydrous hydrogen bromide is a powerful chemical compound that is both a useful tool for manufacturing chemists and a valuable raw material. As with all powerful tools, it must be handled with care by trained, well-equipped professionals. Handled properly, it rewards us with everything from high-energy fuels to health-giving drugs while saving lives by protecting us from fires – and does so safely and without harm to our environment.

### Note

This document provides general information about anhydrous hydrogen bromide and does not supplant or replace required regulatory and/or legal communication documents, nor is it intended to provide an in-depth discussion of health and safety information. Always consult the product’s material safety data sheet, product label and technical data sheet before using the chemical.

---

## References

### Hydrobromic Acid, Anhydrous Material Safety Data Sheet

Albemarle Corporation, July 11, 2006

### Hydrobromic Acid, Anhydrous Liquid Product Data Sheet

BC-0053, Albemarle Corporation, October, 2007

### Anhydrous Hydrobromic Acid Product Stewardship Summary

Albemarle Corporation, January 26, 2007

### Annual Product Stewardship Site Audit Questionnaire

Albemarle Corporation, 2005, Occupational Safety and Health Guideline for Hydrogen Bromide

<http://www.osha.gov/SLTC/healthguidelines/hydrogenbromide/recognition.html>

<http://environmentalchemistry.com/yogi/chemicals/cn/Hydrobromic%20acid.html>

### Bromine, Inorganic Compounds

Kirk-Othmer Encyclopedia of Chemical Technology, 2002

[http://www.dsb.com/brome/brome.nsf/7eddd01a22d7b740422566250043ed2c/a4fc1fboe9d58d9542256ca50036c8c9/\\$FILE/bromukel.a01.pdf](http://www.dsb.com/brome/brome.nsf/7eddd01a22d7b740422566250043ed2c/a4fc1fboe9d58d9542256ca50036c8c9/$FILE/bromukel.a01.pdf)

### Hydrogen bromide is a component of volcano gas.

[Matteucci M; CR Acad Sci 129: 65-7 (1899) as cited in Graedel TE et al; Atmospheric Chemical Compounds p.94 (1986)]

<http://www.gasdetection.com/TECH/hbr.html>

<http://www.nanolab.ucla.edu/pdf/HBrmsds.pdf>

---

## How to Contact Us

You can write us for additional information at: Albemarle Corporation  
Responsible Care Coordinator  
451 Florida Street  
Baton Rouge, LA 70801-1765

Or e-mail us at: [HSE@albemarle.com](mailto:HSE@albemarle.com)



Albemarle Corporation is a member of the American Chemistry Council and, through ACC's participation with the International Council of Chemical Associations (ICCA), has prepared this document to improve product stewardship within the chemical industry and with suppliers and customers.

The information presented herein is believed to be accurate and reliable, but is presented without guarantee or responsibility on the part of Albemarle Corporation and its subsidiaries. It is the responsibility of the user to comply with all applicable laws and regulations and to provide for a safe workplace. The user should consider any health or safety hazards or information contained herein only as a guide, and should take those precautions which are necessary or prudent to instruct employees and to develop work practice procedures in order to promote a safe work environment. Further, nothing contained herein shall be taken as an inducement or recommendation to manufacture or use any of the herein materials or processes in violation of existing or future patent.