Hydrogen bromide, anhydrous

Safety Data Sheet P-4605

This SDS conforms to U.S. Code of Federal Regulations 29 CFR 1910.1200, Hazard Communication.

Issue date: 01/01/1980 Revision date: 01/25/2021 Supersedes: 10/17/2016 Version: 1.0

SECTION: 1. Product and company identification

1.1. Product identifier

Product form : Substance

Substance name : Hydrogen bromide, anhydrous

CAS-No. : 10035-10-6

Formula : HBr

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture : Industrial use; Use as directed.

1.3. Details of the supplier of the safety data sheet

Praxair, Inc.
10 Riverview Drive
Danbury, CT 06810-6268 - USA
T 1-800-772-9247 (1-800-PRAXAIR) - F 1-716-879-2146
www.praxair.com

1.4. Emergency telephone number

Emergency number : Onsite Emergency: 1-800-645-4633

CHEMTREC, 24hr/day 7days/week
— Within USA: 1-800-424-9300, Outside USA: 001-703-527-3887
(collect calls accepted, Contract 17729)

SECTION 2: Hazard identification

2.1. Classification of the substance or mixture

GHS US classification

Press. Gas (Liq.)	H280
Acute Tox. 3 (Inhalation:gas)	H331
Skin Corr. 1A	H314
Eye Dam. 1	H318
STOT SE 3	H335
Aquatic Acute 3	H402

2.2. Label elements

GHS US labeling

Hazard pictograms (GHS US) :

GHS04 GHS05 GHS06

Signal word (GHS US) : Danger

Hazard statements (GHS US) : H280 - CONTAINS GAS UNDER PRESSURE; MAY EXPLODE IF HEATED
H314 - CAUSES SEVERE SKIN BURNS AND EYE DAMAGE
H331 - TOXIC IF INHALED
CGA-HG22 - CORROSIVE TO THE RESPIRATORY TRACT
CGA-HG01 - MAY CAUSE FROSTBITE.

Precautionary statements (GHS US) : P202 - Do not handle until all safety precautions have been read and understood.
P260 - Do not breathe gas/vapors
P262 - Do not get in eyes, on skin, or on clothing.
P264 - Wash exposed skin thoroughly after handling
P271+P403 - Use and store only outdoors or in a well-ventilated place.
P273 - Avoid release to the environment.

P280+P284 - Wear protective gloves, protective clothing, eye protection, respiratory protection, and/or face protection.
P405 - Store locked up.
P501 - Dispose of contents/container Dispose in a safe manner in accordance with local/national regulations
CGA-PG05 - Use a back flow preventive device in the piping.
CGA-PG20+CGA-PG10 - Use only with equipment of compatible materials of construction and rated for cylinder pressure.
CGA-PG12 - Do not open valve until connected to equipment prepared for use.
CGA-PG18 - When returning cylinder, install leak tight valve outlet cap or plug.
CGA-PG06 - Close valve after each use and when empty.
CGA-PG02 - Protect from sunlight when ambient temperature exceeds 52°C (125°F).
CGA-PG31 - Decomposition Hazard: Store under dry ice.
P303+P361+P353 - IF ON SKIN OR (HAIR): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P363 - Wash contaminated clothing before reuse.
P336 - Thaw frosted parts with lukewarm water. Do not rub affected area.
P310 - Immediately call a poison center or doctor/physician.
P304+P340 - IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P311 - Call a poison center or doctor.
P305+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308+P313 - If exposed or concerned: Get medical advice/attention.
P321 - Specific treatment (see First aid measures)

2.3. Other hazards

Other hazards which do not result in classification : None.

2.4. Unknown acute toxicity (GHS US)

No data available

SECTION 3: Composition/Information on ingredients

3.1. Substances

Name	Product identifier	%
Hydrogen bromide, anhydrous (Main constituent)	(CAS-No.) 10035-10-6	100

3.2. Mixtures

Not applicable

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures after inhalation : Remove to fresh air and keep at rest in a position comfortable for breathing. If not breathing, give artificial respiration. If breathing is difficult, trained personnel should give oxygen. Call a physician. . WARNING: To avoid possible chemical burns, the rescuer should avoid breathing any exhaled air from the victim.

First-aid measures after skin contact : Do not breathe vapor. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Soak burned areas in an iced aqueous Epsom salt (MgSO4) solution for at least 30 minutes. Wash clothing before reuse. Discard contaminated shoes. Call a physician immediately. Pay particular attention to skin under the nails.

First-aid measures after eye contact : Immediately flush eyes thoroughly with water for at least 15 minutes. Hold the eyelids open and away from the eyeballs to ensure that all surfaces are flushed thoroughly. Contact an ophthalmologist immediately.

First-aid measures after ingestion : Ingestion is not considered a potential route of exposure.

4.2. Most important symptoms and effects, both acute and delayed

No additional information available

4.3. Indication of any immediate medical attention and special treatment needed

Obtain medical assistance.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Non-flammable gas. Use extinguishing media appropriate for surrounding fire.

5.2. Special hazards arising from the substance or mixture

Fire hazard : Not flammable.

Reactivity : Reacts with most metals in the presence of moisture, liberating hydrogen, an extremely flammable gas.

5.3. Advice for firefighters

Firefighting instructions : **DANGER! Toxic, corrosive, liquefied gas.**

Evacuate all personnel from the danger area. Use self-contained breathing apparatus (SCBA) and protective clothing. Immediately cool containers with water from maximum distance. Stop flow of gas if safe to do so, while continuing cooling water spray. Remove ignition sources if safe to do so. Remove containers from area of fire if safe to do so. On-site fire brigades must comply with OSHA 29 CFR 1910.156 and applicable standards under 29 CFR 1910 Subpart L—Fire Protection.

Protection during firefighting : Reacts with most metals in the presence of moisture, liberating hydrogen, an extremely flammable gas.

Special protective equipment for fire fighters : Standard protective clothing and equipment (Self Contained Breathing Apparatus) for fire fighters.

Other information : Containers are equipped with a pressure relief device. (Exceptions may exist where authorized by DOT.).

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures : **Danger: Toxic. Corrosive.** Wear a self-contained breathing apparatus and appropriate personal protective equipment (PPE). (gas tight, chemical-protective) Evacuate personnel to a safe area. Approach suspected leak area with caution. Remove all sources of ignition. Toxic, corrosive vapor can spread from spill. Ventilate area or move container to a well-ventilated area. Before entering the area, especially a confined area, check the atmosphere with an appropriate device.

6.1.1. For non-emergency personnel

No additional information available

6.1.2. For emergency responders

No additional information available

6.2. Environmental precautions

Try to stop release. Reduce vapor with fog or fine water spray. Prevent waste from contaminating the surrounding environment. Prevent soil and water pollution. Dispose of contents/container in accordance with local/regional/national/international regulations. Contact supplier for any special requirements.

6.3. Methods and material for containment and cleaning up

No additional information available

6.4. Reference to other sections

See also sections 8 and 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Wear leather safety gloves and safety shoes when handling cylinders. Protect cylinders from physical damage; do not drag, roll, slide or drop. While moving cylinder, always keep in place removable valve cover. Never attempt to lift a cylinder by its cap; the cap is intended solely to protect the valve. When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders. Never insert an object (e.g, wrench, screwdriver, pry bar) into cap openings; doing so may damage the valve and cause a leak. Use an adjustable strap wrench to remove over-tight or rusted caps. Slowly open the valve. If the valve is hard to open, discontinue use and contact your supplier. Close the container valve after each use; keep closed even when empty. Never apply flame or localized heat directly to any part of the container. High temperatures may damage the container and could cause the pressure relief device to fail prematurely, venting the container contents. For other precautions in using this product, see section 16.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Store in a cool, well-ventilated place. Store and use with adequate ventilation. Store only where temperature will not exceed 125°F (52°C). Firmly secure containers upright to keep them from falling or being knocked over. Install valve protection cap, if provided, firmly in place by hand. Store full and empty containers separately. Use a first-in, first-out inventory system to prevent storing full containers for long periods.

OTHER PRECAUTIONS FOR HANDLING, STORAGE, AND USE: When handling product under pressure, use piping and equipment adequately designed to withstand the pressures to be encountered. Never work on a pressurized system. Use a back flow preventive device in the piping. Gases can cause rapid suffocation because of oxygen deficiency; store and use with adequate ventilation. If a leak occurs, close the container valve and blow down the system in a safe and environmentally correct manner in compliance with all international, federal/national, state/provincial, and local laws; then repair the leak. Never place a container where it may become part of an electrical circuit.

7.3. Specific end use(s)

None.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Hydrogen bromide, anhydrous (10035-10-6)		
ACGIH	ACGIH OEL Ceiling [ppm]	2 ppm
USA OSHA	OSHA PEL (TWA) [1]	10 mg/m³
USA OSHA	OSHA PEL (TWA) [2]	3 ppm
USA IDLH	IDLH [ppm]	30 ppm
ACGIH	Not established	

8.2. Exposure controls

Appropriate engineering controls : Use only in a closed system. A corrosion-resistant, forced-draft fume hood is preferred. LOCAL EXHAUST: A corrosion-resistant system is acceptable. Ensure exposure is below occupational exposure limits (where available).

Eye protection : Provide readily accessible eye wash stations and safety showers. Wear safety glasses when handling cylinders; vapor-proof goggles and a face shield during cylinder changeout or whenever contact with product is possible. Select eye protection in accordance with OSHA 29 CFR 1910.133.

Skin and body protection : Wear metatarsal shoes and work gloves for cylinder handling, and protective clothing where needed. Wear appropriate chemical gloves during cylinder changeout or wherever contact with product is possible. Select per OSHA 29 CFR 1910.132, 1910.136, and 1910.138.

Respiratory protection	:	When workplace conditions warrant respirator use, follow a respiratory protection program that meets OSHA 29 CFR 1910.134, ANSI Z88.2, or MSHA 30 CFR 72.710 (where applicable). Use an air-supplied or air-purifying cartridge if the action level is exceeded. Ensure that the respirator has the appropriate protection factor for the exposure level. If cartridge type respirators are used, the cartridge must be appropriate for the chemical exposure. For emergencies or instances with unknown exposure levels, use a self-contained breathing apparatus (SCBA).
Thermal hazard protection	:	Wear cold insulating gloves when transfilling or breaking transfer connections.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	:	Gas
Appearance	:	Colorless gas.
Molecular mass	:	81 g/mol
Color	:	Colorless. Gives off white fumes in moist air.
Odor	:	Pungent.
Odor threshold	:	No data available
pH	:	Not applicable.
Relative evaporation rate (butyl acetate=1)	:	No data available
Relative evaporation rate (ether=1)	:	Not applicable.
Melting point	:	-87 °C
Freezing point	:	No data available
Boiling point	:	-67 °C
Flash point	:	No data available
Critical temperature	:	89.8 °C
Auto-ignition temperature	:	Not applicable.
Decomposition temperature	:	No data available
Flammability (solid, gas)	:	Not applicable
Vapor pressure	:	2100 kPa
Critical pressure	:	8550 kPa
Relative vapor density at 20 °C	:	No data available
Relative density	:	2.2
Relative gas density	:	2.8
Solubility	:	Water: No data available
Partition coefficient n-octanol/water (Log Pow)	:	0.63
Partition coefficient n-octanol/water (Log Kow)	:	Not applicable.
Viscosity, kinematic	:	Not applicable.
Viscosity, dynamic	:	Not applicable.
Explosive properties	:	Not applicable.
Oxidizing properties	:	None.
Explosion limits	:	Non flammable.

9.2. Other information

Gas group	:	Press. Gas (Liq.)
Additional information	:	Gas/vapor heavier than air. May accumulate in confined spaces, particularly at or below ground level.

SECTION 10: Stability and reactivity

10.1. Reactivity

Reacts with most metals in the presence of moisture, liberating hydrogen, an extremely flammable gas.

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

May occur.

10.4. Conditions to avoid

Avoid moisture in installation systems.

10.5. Incompatible materials

Reacts with most metals in the presence of moisture, liberating hydrogen, an extremely flammable gas. Moisture. Reacts with water to form corrosive acids. Most common metals and their alloys. Ammonia. Strong oxidizers. Fluorine.

10.6. Hazardous decomposition products

Hydrogen. Bromine.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Not classified

Hydrogen bromide, anhydrous (\f)10035-10-6	
LC50 Inhalation - Rat [ppm]	1430 ppm/4h
ATE US (gases)	1430 ppmV/4h

Skin corrosion/irritation : Causes severe skin burns.

pH: Not applicable.

Serious eye damage/irritation : CAUSES SERIOUS EYE DAMAGE.

pH: Not applicable.

Respiratory or skin sensitization : Not classified

Germ cell mutagenicity : Not classified

Carcinogenicity : Not classified

Reproductive toxicity : Not classified

STOT-single exposure : MAY CAUSE RESPIRATORY IRRITATION.

STOT-repeated exposure : Not classified

Aspiration hazard : Not classified

SECTION 12: Ecological information

12.1. Toxicity

Ecology - general : No known ecological damage caused by this product.

12.2. Persistence and degradability

Hydrogen bromide, anhydrous (10035-10-6)	
Persistence and degradability	Not applicable for inorganic gases.

12.3. Bioaccumulative potential

Hydrogen bromide, anhydrous (10035-10-6)	
Partition coefficient n-octanol/water (Log Pow)	0.63
Partition coefficient n-octanol/water (Log Kow)	Not applicable.
Bioaccumulative potential	Not expected to bioaccumulate due to the low log Kow (log Kow < 4). Refer to section 9.

12.4. Mobility in soil

Hydrogen bromide, anhydrous (10035-10-6)	
Mobility in soil	No data available.
Ecology - soil	Because of its high volatility, the product is unlikely to cause ground or water pollution.

12.5. Other adverse effects

Other adverse effects : May cause pH changes in aqueous ecological systems.

Effect on ozone layer : None.

Effect on the global warming : No known effects from this product.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste treatment methods : Contact supplier if guidance is required.

Product/Packaging disposal recommendations : Prevent waste from contaminating the surrounding environment. Prevent soil and water pollution. Do not attempt to dispose of residual or unused quantities. Return container to supplier.

SECTION 14: Transport information

In accordance with DOT

Transport document description (DOT) : UN1048 Hydrogen bromide, anhydrous, 2.3

UN-No.(DOT) : UN1048

Proper Shipping Name (DOT) : Hydrogen bromide, anhydrous

Class (DOT) : 2.3 - Class 2.3 - Poisonous gas 49 CFR 173.115

Hazard labels (DOT) : Poison Gas
2.3 - Poison gas
8 - Corrosive

DOT Special Provisions (49 CFR 172.102) : 3 - This material is poisonous by inhalation (see 171.8 of this subchapter) in Hazard Zone C (see 173.116(a) of this subchapter), and must be described as an inhalation hazard under the provisions of this subchapter.
B14 - Each bulk packaging, except a tank car or a multi-unit-tank car tank, must be insulated with an insulating material so that the overall thermal conductance at 15.5 C (60 F) is no more than 1.5333 kilojoules per hour per square meter per degree Celsius (0.075 Btu per hour per square foot per degree Fahrenheit) temperature differential. Insulating materials must not promote corrosion to steel when wet.
N86 - UN pressure receptacles made of aluminum alloy are not authorized.
N89 - When steel UN pressure receptacles are used, only those bearing the “H” mark are authorized.

Additional information

Emergency Response Guide (ERG) Number : 125 (UN1048);154 (UN1788)

Other information : No supplementary information available.

Special transport precautions : Avoid transport on vehicles where the load space is not separated from the driver's compartment. Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency. Before transporting product containers: - Ensure there is adequate ventilation. - Ensure that containers are firmly secured. - Ensure cylinder valve is closed and not leaking. - Ensure valve outlet cap nut or plug (where provided) is correctly fitted. - Ensure valve protection device (where provided) is correctly fitted.

Transport by sea

UN-No. (IMDG)	:	1048
Proper Shipping Name (IMDG)	:	HYDROGEN BROMIDE, ANHYDROUS
Class (IMDG)	:	2 - Gases
Division (IMDG)	:	2.3 - Toxic gases
MFAG-No	:	125

Air transport

UN-No. (IATA)	:	1048
Proper Shipping Name (IATA)	:	Hydrogen bromide, anhydrous
Class (IATA)	:	2
Civil Aeronautics Law	:	Gases under pressure/Gases toxic under pressure

SECTION 15: Regulatory information

15.1. US Federal regulations

Hydrogen bromide, anhydrous (10035-10-6)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

All components of this product are listed on the Toxic Substances Control Act (TSCA) inventory.

15.2. International regulations

CANADA

Hydrogen bromide, anhydrous (10035-10-6)
Listed on the Canadian DSL (Domestic Substances List)

EU-Regulations

Hydrogen bromide, anhydrous (10035-10-6)
Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

15.2.2. National regulations

Hydrogen bromide, anhydrous (10035-10-6)
Listed on the AICS (Australian Inventory of Chemical Substances) Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China) Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory Listed on the Japanese ISHL (Industrial Safety and Health Law) Listed on KECL/KECI (Korean Existing Chemicals Inventory) Listed on NZIoC (New Zealand Inventory of Chemicals) Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances) Japanese Poisonous and Deleterious Substances Control Law Listed on the Canadian IDL (Ingredient Disclosure List) Listed on INSQ (Mexican National Inventory of Chemical Substances) Listed on the TCSI (Taiwan Chemical Substance Inventory)

15.3. US State regulations

Hydrogen bromide, anhydrous(10035-10-6)	
U.S. - California - Proposition 65 - Carcinogens List	No
U.S. - California - Proposition 65 - Developmental	No

Hydrogen bromide, anhydrous(10035-10-6)	
Toxicity	
U.S. - California - Proposition 65 - Reproductive Toxicity - Female	No
U.S. - California - Proposition 65 - Reproductive Toxicity - Male	No
State or local regulations	U.S. - Massachusetts - Right To Know List U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) List

SECTION 16: Other information

Other information : When you mix two or more chemicals, you can create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you produce the mixture. Consult an industrial hygienist or other trained person when you evaluate the end product. Before using any plastics, confirm their compatibility with this product.

Linde asks users of this product to study this SDS and become aware of the product hazards and safety information. To promote safe use of this product, a user should (1) notify employees, agents, and contractors of the information in this SDS and of any other known product hazards and safety information, (2) furnish this information to each purchaser of the product, and (3) ask each purchaser to notify its employees and customers of the product hazards and safety information.

The opinions expressed herein are those of qualified experts within Linde Inc. We believe that the information contained herein is current as of the date of this Safety Data Sheet. Since the use of this information and the conditions of use are not within the control of Linde Inc, it is the user's obligation to determine the conditions of safe use of the product.

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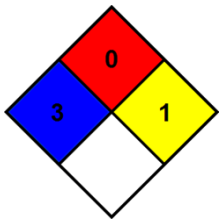
Revision date : 01/25/2021

NFPA health hazard : 3 - Materials that, under emergency conditions, can cause serious or permanent injury.

NFPA fire hazard : 0 - Materials that will not burn under typical fire conditions, including intrinsically noncombustible materials such as concrete, stone, and sand.

NFPA instability : 1 - Materials that in themselves are normally stable but can become unstable at elevated temperatures and pressures.



SDS US GHS DUAL BRANDED LINDE->PRAXAIR

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.