Safety Data Sheet

Revision date: 05.2015 Version: 1.1

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Trade name/designation:	Hydrobromic acid, BDH Aristar® Ultra
Product No.:	87003-654
Other means of identification:	EU Index # 035-002-01-8

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

Relevant identified uses: For laboratory use only. Not for drug, food, or household use.

1.3. Details of the supplier of the safety data sheet

Manufactured for	VWR International, LLC Radnor Corporate Center 100 Matsonford Road Radnor, PA 19087-8660	VWR International Co 2360 Argentia Road Mississauga, ON L5N 5Z7 CANADA
Telephone	610.386.1700	800.932.5000

1.4. Emergency Telephone number

CHEMTREC	800.424.9300
CANUTEC	613.996.6666

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS) and WHMIS HPR

For the full text of the H-Statement(s) and P-Statement(s) mentioned in this Section, see Section 16.

Hazard classes and hazard categories	Hazard statements
Skin corrosion, category 1A	H314
Specific target organ toxicity, single exposure, category 3	H335
Corrosive to metals, category 1	H290

2.2. GHS Label elements, including precautionary statements

Pictograms:

Signal word: Danger

Hazard statements	
H314	Causes severe skin burns and eye damage.
H335	May cause respiratory irritation.

Precautionary statements	
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P303+P361+P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310	Immediately call a POISON CENTER or doctor.
P501	Dispose of contents/containers in accordance with local, state and federal regulations.

2.4. Hazards not otherwise classified (HNOC) or not covered by GHS or WHIMS

None known.

SECTION 3: Composition / information on ingredients

3.1. Hazard components

Chemical name	Formula	Molecular weight	CAS#	Weight%
Hydrobromic acid	HBr	80.91	10035-10-6	44-49%
Water	H_2O	18.02	7732-18-5	Balance

SECTION 4: First aid measures

4.1. General information

In case of inhalation: This chemical is very toxic. Take precautions to ensure your own safety before attempting rescue (e.g. wear appropriate protective equipment, use the buddy system). Remove source of exposure or move person to fresh air and keep comfortable for breathing. Immediately call a Poison Centre or doctor. Specific treatment is urgent. If breathing is difficult, trained personnel should administer emergency oxygen if advised to do so by the Poison Centre or doctor. If breathing has stopped, trained personnel should begin rescue breathing or, if the heart has stopped, cardiopulmonary resuscitation (CPR) or automated external defibrillation (AED). Avoid mouth-to-mouth contact by using mouth guards or shields. Note: Symptoms of pulmonary edema can be delayed up to 48 hours after exposure.

In case of skin contact: Avoid direct contact. Wear chemical protective clothing, if necessary. Take off immediately all contaminated clothing, shoes and leather goods (e.g. watchbands, belts). Rinse skin with lukewarm, gently flowing water/shower for at least 30 minutes. Immediately call a Poison Centre or doctor. Double bag, seal, label and leave contaminated clothing, shoes and leather goods at the scene for safe disposal. NOTE: Any skin contact will also involve significant inhalation exposure.

In case of eye contact: Remove source of exposure or move person to fresh air. Rinse eyes cautiously with lukewarm, gently flowing water for several minutes, while holding the eyelids open. Remove contact lenses, if present and easy to

do. Continue rinsing for up to 30 minutes. Take care not to rinse contaminated water into the unaffected eye or onto the face. Immediately call a Poison Centre or doctor.

In case of ingestion: Rinse mouth. Do NOT induce vomiting. Immediately call a Poison Centre or doctor. If vomiting occurs naturally, lie on your side in the recovery position.

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

Hydrobromic acid readily releases very toxic hydrogen bromide gas. The gas is much heavier than air and can easily accumulate in low-lying areas. It is also hygroscopic and forms a corrosive fog in damp air. Very low concentrations (a few ppm) can cause irritation of the nose, throat, and respiratory tract. Exposures to higher concentrations can lead to a potentially fatal accumulation of fluid in the lungs (pulmonary edema). Symptoms of pulmonary edema (chest pain and shortness of breath) can be delayed for up to 24 or 48 hours after exposure.

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

Consult a doctor and/or the nearest Poison Control Centre for all exposures.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Hydrobromic acid does not burn. Use extinguishing media suitable for the surrounding fire.

5.2. Special hazards arising from the substance or mixture

Not combustible. Hydrogen bromide is less thermally stable than hydrogen chloride. It decomposes at temperatures less than 1500 °C (2730 °F) to form extremely flammable hydrogen gas and very toxic bromine. At the very high temperatures encountered in a fire, it breaks down to form bromine, hydrogen and other irritant and toxic gases. Contact of hydrobromic acid with some metals can produce flammable hydrogen gas.

5.3. Special protective equipment for firefighters

Hydrobromic acid is very corrosive and toxic. Do not enter without wearing specialized equipment suitable for the situation. Firefighter's normal protective clothing (Bunker Gear) will not provide adequate protection. Chemical protective clothing (e.g. chemical splash suit) and positive pressure self-contained breathing apparatus (NIOSH approved or equivalent) may be necessary.

5.4. Hazardous combustion products

Bromine, hydrogen gas.

5.5. Advice for firefighters

Evacuate area and fight fire from a safe distance or protected location. Approach fire from upwind to avoid corrosive and very toxic hydrogen bromide gas and bromine vapor.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Restrict access to area until completion of clean-up. Ensure clean-up is conducted by trained personnel only. Wear adequate personal protective equipment. Ventilate area. Do not use metal tools.

6.2. Environmental precautions

Notify government occupational health and safety and environmental authorities.

6.3. Methods and material for containment and cleaning up

Do not touch spilled material. Prevent material from entering sewers or confined spaces. Stop or reduce leak if safe to do so.

SMALL SPILLS: Neutralize spill with alkaline material (soda ash, lime), then absorb with an inert material (e. g. vermiculite, dry sand, earth). Put material in suitable, covered, labeled containers. Flush area with water. Do not get water inside containers or on spilled material. Contaminated absorbent material may pose the same hazards as the spilled product.

LARGE SPILLS: Contact fire and emergency services and supplier for advice.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

This material is VERY TOXIC if inhaled and is CORROSIVE to the skin, eyes and respiratory tract. Before handling, it is very important that engineering controls are operating and that protective equipment requirements and personal hygiene measures are being followed. People working with this chemical should be properly trained regarding its hazards and its safe use. Maintenance and emergency personnel should be advised of potential hazards. Unprotected persons should avoid contact with this chemical, including contaminated equipment.

In case of leaks or spills, escape-type respiratory protective equipment should be available in the work area. Immediately report leaks, spills or ventilation failures. Be aware of typical signs and symptoms of poisoning and first aid procedures. Any signs of illness should be reported immediately to supervisory personnel. Seek medical attention for all exposures even if an exposure did not seem excessive. Symptoms of a severe exposure can be delayed.

Avoid generating vapors or mists. Prevent the release of vapors or mist into workplace air. If possible, use closed handling systems for processes involving this material. If a closed handling system is not possible, use in smallest possible amounts in a well-ventilated area, separate from the storage area. Do not use near welding operations, flames or hot surfaces.

Do not use with incompatible materials such as strong oxidizing agents (e.g. hydrogen peroxide, perchlorates), metals (e.g. steel, copper, zinc) and bases. See Section 10 for more information. Never return contaminated material to its original container. Never add water to a corrosive. Always add corrosives to water. When mixing with water, stir small amounts in slowly. Use cold water to prevent excessive heat generation. Use corrosion-resistant transfer equipment when dispensing. Do not use with metal spatula or other metal items.

Inspect containers for leaks before handling. Prevent damage to containers. Label containers. Open containers carefully on a stable surface. Keep containers closed when not in use. Secondary protective containers must be used when this material is being carried. Cautiously, dispense into sturdy containers made of compatible materials. Assume that empty containers contain residues which are hazardous. Do not perform any welding, cutting, soldering, drilling or other hot work on an empty vessel, container or piping until all liquid and vapors have been cleared.

Have suitable emergency equipment for fires, spills and leaks readily available. Practice good housekeeping. Maintain handling equipment. Comply with applicable regulations.

7.2. Conditions for safe storage, including any incompatibilities

Store in a cool, dry, well-ventilated area, out of direct sunlight and away from heat. Keep quantity stored as small as possible. Store away from incompatible materials, such as strong oxidizers, bases and some metals. See Section 10 for more information.

Storage area should be clearly identified, clear of obstruction and accessible only to trained and authorized personnel. Keep storage area separate from work areas, eating areas and protective equipment storage. Post warning signs. Inspect periodically for damage or leaks. Avoid bulk storage indoors. Store in isolated fireproof building, if possible. Storage facilities should be made of fire-resistant materials.

Inspect all incoming containers to make sure they are properly labeled and not damaged. Inspect containers regularly for leakage or expired shelf life. Replace defective containers. Protect the label and keep it visible. Have replacement containers and labels on hand. Store in suitable, unbreakable, labeled containers (usually the shipping container). Containers which are opened must be carefully resealed and kept upright to prevent leakage. Contents are air and light sensitive. Container contents may develop pressure after prolonged exposure to heat. Drums may need to be vented. Venting should only be performed by trained personnel. Handling swollen drums requires special procedures and equipment. If drums are swollen, contact the manufacturer/supplier immediately for assistance.

Keep empty containers in separate storage area. Empty containers may contain hazardous residues. Keep closed. Contain spills or leaks by storing in trays made from compatible materials. Keep absorbents for leaks and spills readily available. Have appropriate fire extinguishers and spill clean-up equipment in storage area.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Chemical Name	Limit Value Type	Exposure Limit Value	Source
Hydrogen bromide	TLV-C	2 ppm	USA ACGIH
	REL-C	3 ppm (10 mg/m^3)	USA NIOSH
	PEL-T-TWA	3 ppm (10 mg/m^3)	USA OSHA
	IDLH	30 ppm	USA NIOSH
Water	None listed.	Not applicable	Not applicable

8.2. Exposure controls

Appropriate engineering controls: Engineering methods to control hazardous conditions are preferred. Methods include mechanical ventilation (dilution and local exhaust), process or personnel enclosure, control of process conditions, and process modification (e.g. substitution of a less hazardous material). Administrative controls and personal protective equipment may also be required.

Because of the high potential hazard of this material, stringent control measures such as enclosure (closed handling system) or isolation may be necessary, particularly where there is large-scale use of this material. If a closed handling system is not possible, local exhaust ventilation should be used. Use a corrosion-resistant ventilation system separate from other exhaust ventilation systems. Exhaust directly to the outside. Supply sufficient replacement air to make up for air removed by exhaust systems.

Personal protective equipment:

Eye/face protection: Chemical safety goggles. A face shield may also be necessary.

Skin protection: Chemical protective gloves, coveralls, boots, and/or other chemical protective clothing. A chemical protective full-body encapsulating suit and respiratory protection may be required in some operations. Have a safety shower and eye-wash fountain readily available in the immediate work area.

Respiratory protection: NIOSH RECOMMENDATIONS FOR HYDROGEN BROMIDE CONCENTRATIONS IN AIR:

UP TO 30 ppm: Any air-purifying, full face piece respirator (gas mask) with a chin-style, front- or back-mounted acid gas canister; OR Any self-contained breathing apparatus with a full face piece; Any supplied-air respirator with a full face piece.

EMERGENCY OF PLANNED ENTRY INTO UNKNOWN CONCENTRATIONS OR IDLH CONDITIONS: Any self-contained breathing apparatus that has a full face piece and is operated in a pressure-demand or other positive-pressure mode; OR Any supplied-air respirator that has a full face piece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus.

ESCAPE: Any air-purifying, full face piece respirator (gas mask) with a chin-style, front- or back-mounted acid gas

canister; OR Any appropriate escape-type, self-contained breathing apparatus.

Hygiene measures: Remove contaminated clothing promptly. Keep contaminated clothing in closed containers. Discard or launder before re-wearing. Inform laundry personnel of contaminant's hazards. Do not eat or drink in work areas. Wash hands thoroughly after handling this material. Maintain good housekeeping.

SECTION 9: Physical and Chemical Properties

9.1. Information on basic physical and chemical properties

a)	Appearance:	
	Physical state	Liquid
	Color	Clear, colorless to pale yellow
b)	Odor	Sharp, irritating odor
c)	Odor threshold	2 ppm (recognition/detection not specified)
d)	pH	1 (0.1M solution); 0 (1M) (calculated)
e)	Melting point/freezing point	47.6% (w/w): -11 °C (12.2 °F)
f)	Boiling point/boiling range	47.6% (w/w): 124.3 °C (255.7 °F)
g)	Flash point	Not combustible (does not burn).
h)	Evaporation rate	No information available.
i)	Flammability (solid, gas)	Not applicable
j)	Upper/lower flammability/explosive limits	Not applicable
k)	Vapor pressure (Partial pressure at 25 °C)	48% w/w: 0.017 kPa (0.13 mm Hg)
l)	Vapor density	47% w/w: 1.7 (air = 1)
m)	Relative density (at 25 °C)	50% (w/w): 1.52 g/cm^3; 47.6% (w/w): 1.48 g/cm^3
n)	Solubilities	Soluble in all proportions in water. Soluble in ethanol.
o)	Partition coefficient (n-Octanol/Water)	Log P(oct) = 0.63 (estimated)
p)	Auto-ignition temperature	Not applicable
q)	Decomposition temperature	No information available.
r)	Viscosity	No information available.
s)	Explosive properties	Not applicable
t)	Oxidizing properties	Not applicable

SECTION 10: Stability and reactivity

10.1. Reactivity

See Section 10.5 for incompatible materials.

10.2. Chemical stability

Normally stable. Forms bromine on standing, by air oxidation or exposure to light.

10.3. Possibility of hazardous reactions

Forms bromine on standing, by air oxidation or exposure to light.

10.4. Conditions to avoid

High temperatures, air, light.

10.5. Incompatible materials

STRONG OXIDIZING AGENTS (e.g. hydrogen peroxide, perchlorates, potassium permanganate) - react to give off very toxic bromine.

BASES (e.g. sodium hydroxide, potassium hydroxide, amines) - react violently generating heat and pressure.

METALS (e.g. steel, copper, brass or zinc) - react to generate extremely flammable hydrogen gas and very toxic bromine vapors.

FLUORINE - react producing flame.

ACETYLIDES, BORIDES, CARBIDES, SILICIDES - may react producing flammable gas (e.g. acetylene).

10.6. Hazardous decomposition products

Very toxic and corrosive bromine.

SECTION 11: Toxicology

11.1. Information on toxicological effects

Acute toxicity

Oral LD50: No information available.

Inhalation LC50: 2858 ppm/1H (rat); 814 ppm/1H (mouse)

Dermal LD50: No information available.

Other information on acute toxicity: RTECS# MW3850000

Skin corrosion/irritation: Hydrobromic acid is corrosive. Corrosive materials can cause severe burns, blisters, ulcers and permanent scarring, depending on the concentration of the solution and the duration of contact. Any skin contact will also involve significant inhalation exposure.

Serious eye damage/eye irritation: Hydrobromic acid is corrosive. Corrosive materials can cause severe eye burns, and permanent injury, including blindness, depending on the concentration of the solution and the duration of contact. High airborne concentrations of hydrogen bromide gas are also expected to irritate the eyes.

Respiratory or skin sensitization: Repeated inhalation exposure may cause irritation of the nose and throat with mucus production.

Germ cell mutagenicity: Not known to be mutagenic.

Carcinogenicity: Not known to be a carcinogen.

Reproductive toxicity: Not known to cause reproductive effects.

Specific target organ toxicity-single exposure: May cause respiratory irritation.

Specific target organ toxicity-repeated exposure: No information available.

Aspiration hazard: No information available.

Additional information: Repeated inhalation exposure may cause irritation of the nose and throat with mucus production. Repeated skin contact with low concentrations of hydrobromic acid solutions may cause red, dry, cracked, irritated skin (dermatitis). To the best of our knowledge, the chronic toxicity of this substance has not been fully investigated.

SECTION 12: Ecological information

12.1. Ecotoxicity: No information available.

12.2. Persistence and degradability: Persistent.

12.3. Bioaccumulative potential: Bioaccumulation is not anticipated for inorganic compounds that are miscible with water.

12.4. Mobility in soil: No information available.

12.5. Results of PBT and vPvB assessment: Not applicable for inorganic substances.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Store material for disposal as indicated in Storage Conditions. It may be acceptable to neutralize the material and dispose down the drain. Review federal, provincial and local government requirements prior to disposal.

SECTION 14: Transport information

Land Transport DOT (U.S.)

UN Number	UN1788
Proper Shipping Name	HYDROBROMIC ACID, with not more than 49 percent hydrobromic acid
Class(es)	8
Hazard Label(s)	Corrosive
Packing Group	II
Environmental Hazard(s)	--

Sea Transport IMDG

UN Number	UN1788
Proper Shipping Name	HYDROBROMIC ACID
Class(es)	8
Hazard Label(s)	Corrosive
EMS- No.	F-A, S-B
Packing Group	II
Environmental Hazard(s)	--
Segregation Group	Category C

Air Transport IATA

UN Number	UN1788
Proper Shipping Name	**Hydrobromic Acid** 49% or less strength
Class(es)	8
Hazard Label(s)	Corrosive
Packing Group	II

SECTION 15: Regulatory information

OSHA Hazards: CAS# 10035-10-6 meets criteria for hazardous material, as defined by 29 CFR 1910.1200.

SARA 302 Extremely Hazardous Substances: This material contains Hydrobromic acid (CAS# 10035-10-6), which is not subject to the reporting requirements.

SARA 313 (TRI reporting): This material contains Hydrobromic acid (CAS# 10035-10-6), which is not subject to the reporting requirements of Section 313 of SARA Title III.

SARA 311/312 Hazardous Chemicals: This material contains Hydrobromic acid (CAS# 10035-10-6).

Massachusetts Right-To-Know Substance List: CAS# 10035-10-6 is listed, 10 lbs RQ.

Pennsylvania Right-To-Know Hazardous Substances: CAS# 10035-10-6 is listed.

New Jersey Worker and Community Right-To-Know Components: CAS# 10035-10-6 is listed, RTK# 1011.

California Proposition 65: CAS# 10035-10-6 is not subject to this act. CAS# 7732-18-5 is not subject to this act.

Inventory Status:

Canada DSL/NDSL Inventory List: CAS# 10035-10-6 is listed. CAS# 7732-18-5 is listed.

US TSCA Inventory List: CAS# 10035-10-6 is listed. CAS# 7732-18-5 is listed.

EINECS, ELINCS or NLP: CAS# 10035-10-6 is listed, EC# 233-113-0. CAS# 7732-18-5 is listed, EC# 231-791-2.

SECTION 16: Other information

Full text of H-Statement(s) and P-Statement(s)

H314	Causes severe skin burns and eye damage.
H335	May cause respiratory irritation.
H290	May be corrosive to metals.
P234	Keep only in original container.
P260	Do not breathe fumes/gas/mist/vapours/spray.
P264	Wash thoroughly after handling.
P271	Use only in a well-ventilated area.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P301+P330+P331	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303+P361+P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water.
P304+P340	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310	Immediately call a POISON CENTER or doctor.
P363	Wash contaminated clothing before reuse.
P390	Absorb spillage to prevent material damage.
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P405	Store locked up.
P406	Store in corrosion resistant container with a resistant inner liner.
P501	Dispose of contents/containers in accordance with local, state and federal regulations.

Canadian Carcinogenicity hazard class:	Not applicable.
PHNOC hazard class:	Not applicable.
HHNOC hazard class:	Not applicable.
Biohazardous Infectious Materials hazard class:	Not applicable.

NFPA Rating:

Health: 3
Flammability: 0
Reactivity: 0
Special Hazard: Not applicable

DISCLAIMER

The above information is believed to be correct but does not purport to be all-inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. VWR International and its Affiliates shall not be held liable for any damage resulting from handling.