

## Hydrogen bromide

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

#### 1.1. Product identifier

<b>Name of product</b>	Hydrogen bromide Art-Nr(n): 2000
<b>Name of substance</b>	Hydrogen bromide
<b>Index No</b>	035-002-00-0
<b>EC No</b>	233-113-0
<b>REACH registration number</b>	01-2119479072-39
<b>CAS No</b>	10035-10-6

#### Manufacturer / Distributor:

##### **Ehsan International Gases**

40/9, Aurangabad, Nazimabad  
#3, Karachi 74600, Pakistan.  
+92 21 36612091 – 36612907

[info@ehsan.com.pk](mailto:info@ehsan.com.pk)

[www.ehsan.com.pk](http://www.ehsan.com.pk)

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

##### Identified uses

##### Sector of uses [SU]

SU10 - Formulation [mixing] of preparations and/or re-packaging (excluding alloys)

SU16 - Manufacture of computer, electronic and optical products, electrical equipment

SU8 - Manufacture of bulk, large scale chemicals (including petroleum products)

##### Product categories [PC]

PC19 - Intermediate

PC2 - Adsorbents

PC33 - Semiconductors

##### Process categories [PROC]

PROC1 - Use in closed process, no likelihood of exposure

PROC2 - Use in closed, continuous process with occasional controlled exposure

PROC3 - Use in closed batch process (synthesis or formulation)

##### Environmental release categories [ERC]

ERC1 - Manufacture of substances

ERC2 - Formulation of preparations (mixtures)

ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles ERC6a

- Industrial use resulting in manufacture of another substance (use of intermediates)

ERC6b - Industrial use of reactive processing aids

##### Recommended intended purpose(s)

Basic substance.

Reducing agent.

Catalyst.

## Hydrogen bromide

### SECTION 2: Hazards identification

#### 2.1. Classification of the substance or mixture

Classification according to 67/548/EEC or 1999/45/EC

C; R35

Xi; R37

#### R-phrases

35 Causes severe burns.

37 Irritating to respiratory system.

Classification according to Regulation (EC) No 1272/2008 [CLP/GHS]

Hazard classes and Hazard	Hazard Statements	Classification procedure categories
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#### Liquef. Gas

H280

Acute Tox. 3

H331

Skin Corr. 1A

H314

#### Hazard statements for physical hazards

H280 Contains gas under pressure; may explode if heated.

#### Hazard statements for health hazards

H314 Causes severe skin burns and eye damage.

H331 Toxic if inhaled.

H335 May cause respiratory irritation.

#### 2.2. Label elements

Labelling according to Regulation (EC) No 1272/2008 [CLP/GHS]



GHS05



GHS06

#### Signal word

Danger

#### Hazard statements for physical hazards

H280 Contains gas under pressure; may explode if heated.

#### Hazard statements for health hazards

H314 Causes severe skin burns and eye damage.

H331 Toxic if inhaled.

H335 May cause respiratory irritation.

#### Precautionary Statements

#### Prevention

P260 Do not breathe gas/vapours.

P280 Wear protective gloves/protective clothing/eye protection/face protection.

#### Response

P303 + P361 + P353 IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.

P304 + P340 IF INHALED: Remove 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.

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P315 Get immediate medical advice/attention.

### Storage

P403 Store in a well-ventilated place.

P405 Store locked up.

### 2.3. Other hazards

#### Adverse human health effects and symptoms

Contact with liquid may cause cold burns/frostbite.

#### Information pertaining to special dangers for human and environment

Dangerous substances are released in case of decomposition.

Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level.

## SECTION 3: Composition/ information on ingredients

### 3.1. Substances

CAS No 10035-10-6

Hydrogen bromide

EC No 233-113-0

Index No 035-002-00-0

REACH registration number 01-2119479072-39

### 3.2. Mixtures

not applicable

## SECTION 4: First aid measures

### 4.1. Description of first aid measures

#### General information

Remove contaminated soaked clothing immediately.

Adhere to personal protective measures when giving first aid.

Seek medical advice immediately.

#### In case of inhalation

Remove the casualty into fresh air and keep him immobile.

In the event of pulmonary irritation treat initially with corticoid spray, e.g. Ventolair- or Pulmicort- metered-dose aerosol (Ventolair and Pulmicort are registered trademarks).

In case of respiratory standstill give artificial respiration by respiratory bag (Ambu bag) or respirator. Send for a doctor.

#### In case of skin contact

In case of contact with skin wash off immediately with plenty of water.

In case of frostbite rinse with plenty of water. Don't remove clothing.

In case of frostbite spray with lukewarm (not hot) water for at least 15 minutes. Apply a sterile dressing. Obtain medical assistance.

#### In case of eye contact

Eye rinsing with water carefully while protecting unhurt eye.

Call for a doctor immediately.

#### In case of ingestion

Ingestion is not considered a potential route of exposure.

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

#### ! Physician's information / possible symptoms

Coughing

#### Physician's information / possible dangers

## Hydrogen bromide

Risk of pulmonary oedema

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

#### Treatment (Advice to doctor)

Continue to monitor for pneumonia and pulmonary oedema.

Monitor circulation.

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## SECTION 5: Firefighting measures

### 5.1. Extinguishing media

#### Suitable extinguishing media

Product does not burn, fire-extinguishing activities according to surrounding.

Foam

Dry fire-extinguishing substance

Carbon dioxide

Water spray jet

#### Unsuitable extinguishing media

Full water jet

### 5.2. Special hazards arising from the substance or mixture

In the event of fire the following can be released:

Hydrogen (on contact with firefighting water).

Explosion hazard.

### 5.3. Advice for firefighters

#### Special protective equipment for fire-fighters

Use breathing apparatus with independent air supply ( isolated ). Wear full protective clothing.

#### Additional information

Cool endangered containers with water spray jet.

Exposure to fire may cause containers to rupture / explode.

Fire residues and contaminated firefighting water must be disposed of in accordance with the local regulations.

Collect contaminated firefighting water separately, must not be discharged into the drains.

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## SECTION 6: Accidental release measures

### 6.1. Personal precautions, protective equipment and emergency procedures

See chapter 8.

Remove persons to safety.

Evacuate area.

Keep people away and stay on the upwind side.

### 6.2. Environmental precautions

Collect contaminated water / firefighting water separately.

If possible, stop flow of product.

Do not discharge into the drains/surface waters/groundwater.

Prevent spread over a wide area (e.g. by containment or oil barriers).

If necessary, secure leaky pressure receptacles in a salvage packaging.

Suppress gases/vapours/mists with water spray jet Do not discharge into the subsoil/soil.

### 6.3. Methods and material for containment and cleaning up

Ensure adequate air ventilation.

Clean contaminated objects and floor thoroughly under consideration of environment regulations.

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### 6.4. Reference to other sections

Disposal: see section 13

Informations for safe handling see chapter 7.

Informations for personal protective equipment see chapter 8.

## SECTION 7: Handling and storage

### 7.1. Precautions for safe handling

#### ! Advice on safe handling

Use only in thoroughly ventilated areas.

Transfer and handle only in enclosed systems.

Containers' temperature may not be increased above 50 °C.

Do not heat with open flames.

The working pressure in the receptacle must not exceed the saturation vapour pressure of the pure product resulting at a temperature of 50 °C.

Provide good room ventilation even at ground level (vapours are heavier than air).

Prevent cylinders from falling over.

Ensure valve protection device is correctly fitted.

Ensure valve outlet cap nut or plug (where provided) is correctly fitted.

Open valve slowly to avoid pressure shock.

Use only properly specified equipment which is suitable for this product, its supply pressure and temperature.

Do not allow backfeed into the container.

Suck back of water into the container must be prevented.

No water to valves, flanges and other fittings.

Purging of pipes and valves with inert gases - to avoid: water, solvents.

#### General protective measures

Do not inhale gases/vapours/aerosols.

#### Hygiene measures

At work do not eat, drink, smoke or take drugs. Wash hands before breaks and after work.

#### Advice on protection against fire and explosion

The product is not flammable in air under ambient conditions of temperature and pressure.

### 7.2. Conditions for safe storage, including any incompatibilities

#### Requirements for storage rooms and vessels

Keep in closed original container.

Ventilate store-rooms thoroughly.

Only use containers that are approved specifically for the substance/product.

Suitable materials: Normalised steel and carbon steel, tempered steel, aluminium alloys, stainless steel.

#### ! Advice on storage compatibility

Do not store with spontaneously flammable materials.

Do not store together with combustible liquids or combustible solids.

Do not store together with animal feedstuffs.

Do not store together with explosives.

Do not store together with infectious substances.

Do not store together with radioactive material.

Do not store together with toxic liquids or toxic solids.

Do not store together with food.

Do not store together with oxidizing liquids or oxidizing solids.

#### Further information on storage conditions

Store only in original container at temperature of 50°C maximum (=122°F).

Keep container tightly closed and store at cool and aired place.

Prevent cylinders from falling over.

## Hydrogen bromide

Protect of heat.

Recommended storage temperature:  $\leq 25$  °C.

### 7.3. Specific end use(s)

#### ! Recommendation(s) for intended use

See exposure scenario(s).

## SECTION 8: Exposure controls/personal protection

### 8.1. Control parameters

#### Ingredients with occupational exposure limits to be monitored

CAS No	Name	Code	[mg/m <sup>3</sup> ]	[ppm]	Remark
10035-10-6	Hydrogen bromide	WEL, 8 hours			EH40/2007/
		Short-term	10	3	UK

#### Indicative occupational exposure limit values (91/322/EEC, 2000/39/EC, 2006/15/EC or 2009/161/EU)

CAS No	Name	Code	[mg/m <sup>3</sup> ]	[ppm]	Remark
10035-10-6	hydrogen bromide	Short-term	6,7	2	

#### Additional advice

DNEL (workers, inhalation, short-term, local effects): 6,7 mg/m<sup>3</sup> (1,99 ppm).

DNEL (workers, inhalation, short-term, systemic effects): 6,7 mg/m<sup>3</sup> (1,99 ppm).

DNEL (workers, inhalation, long-term, systemic effects): 6,7 mg/m<sup>3</sup> (1,99 ppm). DNEL

(workers, inhalation, long-term, local effects): 6,7 mg/m<sup>3</sup> (1,99 ppm).

### 8.2. Exposure controls

#### Respiratory protection

Short term: filter apparatus, filter E

Short term: filter apparatus, combination filter E-P2

Breathing apparatus in the event of high concentrations.

Keep self contained breathing apparatus readily available for emergency use.

In case of rescue and maintenance activities in storage containers use environment-independent breathing apparatus because of risk of suffocation by edging out of air oxygen

#### ! Hand protection chemical-

resistant gloves

Leather gloves

Glove material specification [make/type, thickness, permeation time/life]: FKM; 0,4 mm;  $\geq 480$  min

Glove material specification [make/type, thickness, permeation time/life]: NBR; 0,4 mm;  $\geq 480$  min

Glove material specification [make/type, thickness, permeation time/life]: CR; 0,5 mm;  $\geq 480$  min

Glove material specification [make/type, thickness, permeation time/life]: IIR,  $\geq 0,5$  mm,  $\geq 480$  min

Glove material specification [make/type, thickness, permeation time/life]: NR,  $\geq 0,5$  mm,  $\geq 480$  min

Glove material specification [make/type, thickness, permeation time/life]: PVC,  $\geq 0,5$  mm,  $\geq 480$  min

#### Eye protection

Safety goggles, in case of increased risk add protective face shield Safety goggles with side protection according to EN 166.

#### Skin protection

Safety shoes with steel toe.

Body covering work clothing, or chemical resistant suit at increased risk.

#### ! Limitation and surveillance of the environment

PNEC (freshwater): 0,019 mg/l See chapter 7.

## Hydrogen bromide

### Additional advice on system design

Transfer and handle only in enclosed systems.

### SECTION 9: Physical and chemical properties

#### 9.1. Information on basic physical and chemical properties

<b>Form</b> compressed liquified gas	<b>Colour</b> colourless	<b>Odour</b> pungent
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#### ! Odour threshold

6,7 mg/m<sup>3</sup>

#### Important health, safety and environmental information

	Value	Temperature	at	Method	Remark
<b>pH value in delivery state</b>	not applicable				
<b>Acid number</b>	not applicable				
<b>boiling point</b>	-66,4 °C		1013 hPa		
<b>melting point</b>	-86,9 °C				
<b>Flash point</b>	no				
<b>Flammable solid</b>	not applicable				
<b>Flammability (gas)</b>	no				
<b>Ignition temperature</b>	no				
<b>Autoignition</b>	no				
<b>Lower explosion limit</b>	no				
<b>Upper explosion limit</b>	no				
<b>Vapour pressure</b>	20003 hPa	20 °C			
<b>Relative density</b>	2,203 g/cm <sup>3</sup>	-66,4 °C			liquid phase
<b>Bulk density</b>	not applicable				
<b>Vapour density</b>	2,71				air = 1
<b>Solubility in water</b>	700 g/l	20 °C			
<b>Solubility/other</b>					Soluble in ethanol
<b>Partition coefficient (log</b>	0,6287	Calculated	<b>pOW)</b>		



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	Value	Temperature	at	Method	Remark
<b>Viscosity dynamic</b>	0,01819 mPa*s	25 °C			vapour phase
<b>Viscosity dynamic</b>	0,61 mPa*s	20 °C			liquid phase
<b>Solvent concentration</b>	not applicable				

### Oxidising properties

no

### Explosive properties

no

### 9.2. Other information

Vapours are heavier than air.

## SECTION 10: Stability and reactivity

### 10.1. Reactivity

See section "Possibility of hazardous reactions".

### 10.2. Chemical stability

Stable under normal conditions.

### 10.3. Possibility of hazardous reactions

Reactions with oxidizing agents.

Reactions with alkali metals.

Reactions with earth alkali metals.

Reactions with alkalies.

Reactions with amines.

### 10.4. Conditions to avoid

Heat sources / heat - risk of bursting.

Humidity.

### 10.5. Incompatible materials

#### ! Materials to avoid

Alkali (lye)

Alkali metals

Amines

Ammonia

nitric acid

Oxidants.

Metallic salts.

Earth alkali metals.

### 10.6. Hazardous decomposition products

Hydrogen

Bromine



## Hydrogen bromide

### Thermal decomposition

Remark No decomposition if used as directed.

### Additional information

May decompose in the presence of a catalyst.

## SECTION 11: Toxicological information

### 11.1. Information on toxicological effects

#### Acute toxicity/Irritability/Sensitization

	Value/Validation	Species	Method	Remark
<b>LD50 acute oral</b>	not applicable			
<b>LD50 acute dermal</b>	not applicable			
<b>LC50 acute inhalation</b>	2858 ppm (1 h)	rat		
<b>Irritability skin</b>	corrosive			experiences
<b>Irritability eye</b>	strong irritant			experiences
<b>Skin sensitization</b>	Not known.			
<b>Sensitization respiratory system</b>	Not known.			

#### Subacute Toxicity - Carcinogenicity

	Value	Species	Method	Validation
<b>Chronic Toxicity</b>				Inflammatory changes in the mucosa of the upper respiratory tract, indigestion, slight change of reflexes and decreased amount of erythrocytes.
<b>Mutagenicity</b>	Inhalation			No experimental information on genotoxicity in vitro and in vivo available.
<b>Reproduction-Toxicity</b>				No information available.
<b>Carcinogenicity</b>				No information available.

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### Specific target organ toxicity (single exposure)

No data available

### Specific target organ toxicity (repeated exposure)

No data available

### Aspiration hazard

not applicable

### ! Experiences made from practice

Risk of strong health injuries in case of long-term exposition.

Irritates respiratory tract.

Pulmonary damage is possible.

Irritates mucous membranes.

## SECTION 12: Ecological information

### 12.1. Toxicity

#### Ecotoxicological effects

	Value	Species	Method	Validation
Fish	LC50 64,05 mg/l	freshwater fish		
Daphnia				not determined
Algae	NOEC 32 mg/l	Alge		

### 12.2. Persistence and degradability

#### Physico-chemical

not determined

#### degradability

#### Biological degradability

Inorganic product, cannot be eliminated from the water by biological purification processes.

### 12.3. Bioaccumulative potential

Because of the n-octanol/water distribution coefficient (log K o/w) accumulation in organisms is not expected.

### 12.4. Mobility in soil

No data available

### 12.5. Results of PBT and vPvB assessment

This substance does not meet the PBT/vPvB criteria of REACH, annex XIII.

### 12.6. Other adverse effects

No information available.

### General regulation

Avoid release to the environment.

Product is not allowed to be discharged into the ground water or aquatic environment.

Product is not allowed to be discharged into aquatic environment, drains or sewage treatment plants.

## SECTION 13: Disposal considerations

### 13.1. Waste treatment methods

#### Waste code No.

16 05 04\*

#### Name of waste

gases in pressure containers (including halons) containing dangerous substances

## Hydrogen bromide

Wastes marked with an asterisk are considered to be hazardous waste pursuant to Directive 91/689/EEC on hazardous waste.

### Recommendations for the product

Dispose of as hazardous waste.  
Return to manufacturer.

### Recommendations for packaging

Transportable pressure equipment (empty, residual pressure): Return to supplier / manufacturer.

## SECTION 14: Transport information

### Land and inland navigation transport ADR/RID

UN 1048 HYDROGEN BROMIDE, ANHYDROUS, 2.3 (8), (C/D), Classification code: 2TC

### Marine transport IMDG

UN 1048 HYDROGEN BROMIDE, ANHYDROUS, 2.3 (8)

### Air transport ICAO/IATA-DGR

UN 1048 Hydrogen bromide, anhydrous, 2.3 (8)  
FORBIDDEN

### Special precautions for user

The protective measures listed in Sections 6, 7 and 8 of the Safety Data Sheet have to be considered.

### Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

not applicable

No transport as bulk according IBC - Code.

## SECTION 15: Regulatory information

### 15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

No information available.

### 15.2. Chemical Safety Assessment

For this substance a chemical safety assessment has been carried out.

Exposure scenarios (ESs) see [http://www.ghc.de/pdf\\_e/es2000.001e.pdf](http://www.ghc.de/pdf_e/es2000.001e.pdf).

## SECTION 16: Other information

### Recommended uses and restrictions

National and local regulations concerning chemicals shall be observed.

### Further information

All declarations of safety-data-sheet refer to pure substance.

The information contained herein is based on the state of our knowledge. It characterizes the product with regard to the appropriate safety precautions. It does not represent a guarantee of the properties of the product. Indication of changes: "!" = Data changed compared with the previous version.

### Wording of the R/H-phrases specified in chapter 3 (not the classification of the mixture!)

R 35 Causes severe burns.

R 37 Irritating to respiratory system.

H280 Contains gas under pressure; may explode if heated.

H314 Causes severe skin burns and eye damage.

H335 May cause respiratory irritation.