

Material Safety Data Sheet

Version 4.0

Revision Date 03/12/2010

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1. PRODUCT AND COMPANY IDENTIFICATION

Product name : Bromine

Product Number : 207888

Brand : Sigma-Aldrich

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

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2. HAZARDS IDENTIFICATION

Emergency Overview

OSHA Hazards

Target Organ Effect, Highly toxic by inhalation, Corrosive

Target Organs

Nerves., LungsNerves., Lungs

GHS Label elements, including precautionary statements

Pictogram



Signal word Danger

Hazard statement(s)

H303 May be harmful if swallowed.

H314 Causes severe skin burns and eye damage.

H330 Fatal if inhaled.

H400 Very toxic to aquatic life.

Precautionary statement(s)

P260 Do not breathe dust/fume/gas/mist/vapours/spray.

P273 Avoid release to the environment.

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

P284 Wear respiratory protection.

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/physician.

HMIS Classification

Health hazard: 3

Chronic Health Hazard: *

Flammability: 0

Physical hazards: 0

NFPA Rating

Health hazard: 3

Fire: 0

Reactivity Hazard: 0

Special hazard.: OX

Potential Health Effects

Inhalation	May be fatal if inhaled. Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract.
Skin	May be harmful if absorbed through skin. Causes skin burns. May be fatal if absorbed through skin.
Eyes	Causes eye burns.
Ingestion	May be harmful if swallowed. Causes burns.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Formula : Br₂
Molecular Weight : 159.81 g/mol

CAS-No.	EC-No.	Index-No.	Concentration
Bromine			
7726-95-6	231-778-1	035-001-00-5	-

4. FIRST AID MEASURES

General advice

Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

If inhaled

If breathed in, move person into fresh air. If not breathing give artificial respiration. Consult a physician.

In case of skin contact

Take off contaminated clothing and shoes immediately. Wash off with soap and plenty of water. Consult a physician.

In case of eye contact

Continue rinsing eyes during transport to hospital. Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed

Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Specific hazards arising from the chemical

Container explosion may occur under fire conditions.

Special protective equipment for fire-fighters

Wear self contained breathing apparatus for fire fighting if necessary.

Further information

May intensify fire; oxidiser.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions

Wear respiratory protection. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas.

Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

Methods and materials for containment and cleaning up

Soak up with inert absorbent material and dispose of as hazardous waste. Keep in suitable, closed containers for disposal.

7. HANDLING AND STORAGE

Precautions for safe handling

Avoid inhalation of vapour or mist.

Normal measures for preventive fire protection.

Conditions for safe storage

Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

Do not store in polyethylene containers. Handle and open container with care.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Value	Control parameters	Update	Basis
Bromine	7726-95-6	TWA	0.1 ppm	2007-01-01	USA. ACGIH Threshold Limit Values (TLV)
Remarks	Upper Respiratory Tract irritation Lower Respiratory Tract irritation Lung damage				
		STEL	0.2 ppm	2007-01-01	USA. ACGIH Threshold Limit Values (TLV)
	Upper Respiratory Tract irritation Lower Respiratory Tract irritation Lung damage				
		TWA	0.1 ppm 0.7 mg/m3	1989-01-19	USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000
		STEL	0.3 ppm 2 mg/m3	1989-01-19	USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000
		TWA	0.1 ppm 0.7 mg/m3	1997-08-04	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
	The value in mg/m3 is approximate.				

Personal protective equipment

Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type AXBEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Hand protection

Handle with gloves.

Eye protection

Tightly fitting safety goggles. Faceshield (8-inch minimum).

Skin and body protection

Choose body protection according to the amount and concentration of the dangerous substance at the work place.

Hygiene measures

Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Form	liquid
Colour	brown

Safety data

pH	no data available
Melting point	7.2 °C (45.0 °F) - lit.
Boiling point	58.8 °C (137.8 °F) - lit.
Flash point	no data available
Ignition temperature	no data available
Lower explosion limit	no data available
Upper explosion limit	no data available
Vapour pressure	233 hPa (175 mmHg) at 20 °C (68 °F) 895 hPa (671 mmHg) at 55 °C (131 °F) 301.307 hPa (225.999 mmHg) at 25 °C (77 °F)
Density	3.119 g/mL at 25 °C (77 °F)
Water solubility	36.5 g/l at 20 °C (68 °F)
Relative vapour density	5.52 - (Air = 1.0)

10. STABILITY AND REACTIVITY

Chemical stability

Stable under recommended storage conditions.

Conditions to avoid

no data available

Materials to avoid

Reducing agents, Alkali metals, Powdered metals, Aluminum, Stainless steel, Iron, Copper, Organic materials, Bromine will attack some types of plastics, rubber, and coatings, Aldehydes, Ketones, arsenic powder, Amines, Amides, phenols, Alcohol, reacts violently with:, Ammonia, Azides, Ozone

Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - Hydrogen bromide gas

11. TOXICOLOGICAL INFORMATION

Acute toxicity

LD50 Oral - rat - 2,600 mg/kg

LC50 Inhalation - rat - 2,700 mg/m3

Remarks: Lungs, Thorax, or Respiration:Other changes.

Skin corrosion/irritation

no data available

Serious eye damage/eye irritation

no data available

Respiratory or skin sensitization

no data available

Germ cell mutagenicity

no data available

Carcinogenicity

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity

no data available

Specific target organ toxicity - single exposure (GHS)

no data available

Specific target organ toxicity - repeated exposure (GHS)

no data available

Aspiration hazard

no data available

Potential health effects

Inhalation	May be fatal if inhaled. Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract.
Ingestion	May be harmful if swallowed. Causes burns.
Skin	May be harmful if absorbed through skin. Causes skin burns. May be fatal if absorbed through skin.
Eyes	Causes eye burns.

Signs and Symptoms of Exposure

burning sensation, Cough, wheezing, laryngitis, Shortness of breath, Headache, Nausea, Vomiting, Cyanosis, Cardiovascular effects., Respiratory disorders, Lachrymation, Nose bleeding, Vertigo, Irritability, loss of appetite, joint pain, Abdominal pain, Diarrhoea, hoarseness

Additional Information

RTECS: EF9100000

12. ECOLOGICAL INFORMATION

Toxicity

Toxicity to fish	LC50 - Oncorhynchus mykiss (rainbow trout) - 0.31 mg/l - 24.0 h
Toxicity to daphnia and other aquatic invertebrates.	LC50 - Daphnia magna (Water flea) - 1 mg/l - 48 h
	EC50 - Daphnia magna (Water flea) - 1.07 mg/l - 24 h

Persistence and degradability

no data available

Bioaccumulative potential

no data available

Mobility in soil

no data available

PBT and vPvB assessment

no data available

Other adverse effects

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

Very toxic to aquatic organisms.

13. DISPOSAL CONSIDERATIONS

Product

Observe all federal, state, and local environmental regulations. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging

Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)

UN-Number: 1744 Class: 8 (6.1) Packing group: I
Proper shipping name: Bromine
Marine pollutant: No
Poison Inhalation Hazard: Hazard zone A

IMDG

UN-Number: 1744 Class: 8 (6.1) Packing group: I EMS-No: F-A, S-B
Proper shipping name: BROMINE
Marine pollutant: No

IATA

UN-Number: 1744 Class: 8 (6.1)
Proper shipping name: Bromine
IATA Passenger: Not permitted for transport
IATA Cargo: Not permitted for transport

15. REGULATORY INFORMATION

OSHA Hazards

Target Organ Effect, Highly toxic by inhalation, Corrosive

DSL Status

All components of this product are on the Canadian DSL list.

SARA 302 Components

Bromine	CAS-No. 7726-95-6	Revision Date 2007-07-01
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SARA 313 Components

Bromine	CAS-No. 7726-95-6	Revision Date 2007-07-01
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SARA 311/312 Hazards

Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

Bromine	CAS-No. 7726-95-6	Revision Date 2007-07-01
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Pennsylvania Right To Know Components

Bromine	CAS-No. 7726-95-6	Revision Date 2007-07-01
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New Jersey Right To Know Components

Bromine	CAS-No. 7726-95-6	Revision Date 2007-07-01
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California Prop. 65 Components

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

Further information

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