Date of issue: 02/06/2017
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Safety Data Sheet

1. Identification of the substance/mixture and of the company/undertaking

Product identifier:
- Product name: Bromine
- SDS No. : 0984E-3

Details of the supplier of the safety data sheet
- Manufacturer/Supplier: KISHIDA CHEMICAL CO., LTD.
- Address: 3-1, Honmachibashi, Chuo-ku,Osaka ,JAPAN
- Division: Safety Management Dept. of Chemicals
- Telephone number: +81-6-6946-8061
- FAX: +81-6-6946-1607
- e-mail address: kagakuhinanzenkanri@kishida.co.jp

2. Hazards identification

GHS classification and label elements of the product

Classification of the substance or mixture

PHYSICAL AND CHEMICAL HAZARDS
- Corrosive to metals: Category 1

HEALTH HAZARDS
- Acute toxicity (Inhalation): Category 2
- Skin corrosion/irritation: Category 1
- Serious eye damage/eye irritation: Category 1
- Specific target organ toxicity - single exposure: Category 1(CNS; respiratory system)
- Specific target organ toxicity - repeated exposure: Category 1(nervous system; respiratory system; endocrine system)

ENVIRONMENT HAZARDS
- Hazardous to the aquatic environment (Acute): Category 1
- Hazardous to the aquatic environment (Long-term): Category 1

(Note) GHS classification without description: Not classified/Classification not possible

Label elements

Signal word: Danger

HAZARD STATEMENT
- May be corrosive to metals
- Fatal if inhaled
- Causes severe skin burns and eye damage
- Causes serious eye damage
- Causes damage to organs after single exposure(CNS; respiratory system)
- Causes damage to organs through prolonged or repeated exposure(nervous system; respiratory system; endocrine system)
- Very toxic to aquatic life
- Very toxic to aquatic life with long lasting effects

PRECAUTIONARY STATEMENT

Prevention
- Avoid release to the environment.
- Keep only in original container.

Do not breathe dust/fume/gas/mist/vapors/spray.
In case of inadequate ventilation wear respiratory protection. (as specified by the manufacturer/supplier or the competent authority.)
Use only outdoors or in a well-ventilated area.
Wash contaminated parts thoroughly after handling.
Wear protective gloves, protective clothing or face protection.
Wear eye protection/face protection.
Do not eat, drink or smoke when using this product.

Response

Absorb spillage to prevent material damage.
Collect spillage.
Get medical advice/attention if you feel unwell.
IF exposed or concerned: Call a POISON CENTER or doctor/physician.
IF INHALED: Remove person to fresh air and keep comfortable for breathing.
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
Wash contaminated clothing before reuse.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

Storage

Store in a well-ventilated place. Keep container tightly closed.

Disposal

Dispose of contents/container in accordance with local/national regulation.

3. Composition/information on ingredients

Mixture/Substance selection:

Substance

Ingredient name:Bromine
Content (%):97(min)
Chemical formula:Br2
CAS No.:7726-95-6
MW:159.8
ECNO:231-778-1

Note : The figures shown above are not the specifications of the product.

Supplementary information concerning ingredients

Cover the liquid surface with purified water to prevent volatilization (other than ampule).

4. First-aid measures

Descriptions of first-aid measures

General measures

Get medical attention/advice if you feel unwell.

IF INHALED

Remove person to fresh air and keep comfortable for breathing.
Call a POISON CENTER or doctor/physician if you feel unwell.

IF ON SKIN (or hair)

Take off immediately all contaminated clothing. Rinse skin with water/shower.
If skin irritation or rash occurs: Get medical advice/attention.

IF IN EYES

Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
If eye irritation persists: Get medical advice/attention.

IF SWALLOWED

Rinse mouth. Do NOT induce vomiting.

Call a POISON CENTER or doctor/physician if you feel unwell.

5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media

Use appropriate extinguishing media suitable for surrounding facilities.

Unsuitable extinguishing media

Unsuitable extinguishing media data is not available.

Specific hazards arising from the substance or mixture

Containers may explode when heated.

Fire may produce irritating, corrosive and/or toxic gases.

Advice for firefighters

Specific fire-fighting measures

Evacuate non-essential personnel to safe area.

Special protective equipment and precautions for fire-fighters

Wear fire/flame resistant/retardant clothing.

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

Firefighters should wear self-contained breathing apparatus with full face peace operated positive pressure mode.

6. Accidental release measures

Personnel precautions, protective equipment and emergency procedures

Ventilate area until material pick up is complete.

Wear proper protective equipment.

Environmental precautions

Prevent spills from entering sewers, watercourses or low areas.

Methods and materials for containment and cleaning up

Absorb spill with inert material (dry sand, earth, et al), then place in a chemical waste container.

Preventive measures for secondary accident

Absorb spillage to prevent material damage.

Collect spillage.

7. Handling and storage

Precautions for safe handling

Preventive measures

(Exposure Control for handling personnel)

Do not breathe dust/fume/gas/mist/vapors/spray.

(Protective measures against fire and explosion)

Keep away from heat/sparks/open flames/hot surfaces. - No smoking.

(Exhaust/ventilator)

Exhaust/ventilator should be available.

(Safety treatments)

Avoid contact with skin.

Avoid contact with eyes.

Safety Measures

Use only outdoors or in a well-ventilated area.

Wear protective gloves, protective clothing or face protection.

Wear eye protection/face protection.

When using do not eat, drink or smoke.

Any incompatibilities

See "10.Stability and Reactivity"

Advice on general occupational hygiene

Wash contaminated parts thoroughly after handling.

Do not eat, drink or smoke when using this product.

Wash contaminated clothing before reuse.

Storage

Conditions for safe storage

Keep container tightly closed.

Store in a cool, dry place. Do not store in direct sunlight.

Keep under lock and key.

(Incompatible storage condition)

The product may corrode metal. Do not keep in a metal container.

Container and packaging materials for safe handling

Keep only in original container.

Store in corrosion resistant/specified container with a resistant inner liner.

Glass

8. Exposure controls/personal protection

Control parameters

Adopted value

(Bromine)

ACGIH(1991) TWA: 0.1ppm;

STEL: 0.2ppm (URT & LRT irr; lung dam)

OSHA-PEL

(Bromine)

TWA: 0.1ppm, 0.7mg/m3

Exposure controls

Appropriate engineering controls

Do not use in areas without adequate ventilation.

Eye wash station should be available.

Washing facilities should be available.

Individual protection measures

Respiratory protection

Wear respiratory protection.

Hand protection

Wear protective gloves.

Eye protection

Wear eye/face protection.

9. Physical and Chemical Properties

Information on basic physical and chemical properties

Physical state: Liquid

Color: Red to dark reddish brown

Odor: Pungent odour

Melting point/Freezing point: −7.2℃

Boiling point or initial boiling point: (Bromine)58.8℃

Boiling range data is not available.

Flammability (gases, liquids and solids) data is not available.

Lower and upper explosion limit/flammability limit data is not available.

Flash point data is not available.

Auto-ignition temperature data is not available.
Decomposition temperature data is not available.
pH data is not available.
Kinematic viscosity: 0.264mm2/s(40℃)
Solubility:
Solubility in water: 4.0g/100ml (20 ℃)
n-Octanol/water partition coefficient data is not available.
Vapor pressure: 23.3 kPa (20 ℃)
Density and/or relative density: 3.1
Relative vapor density (Air=1): 5.5
Relative density of the Vapor/air - mixture at 20℃ (Air = 1): 2
No Particle characteristics data is not available.

10. Stability and Reactivity

Reactivity
Not available.
Chemical stability
Stable under normal storage/handling conditions.
Possibility of hazardous reactions
The vapour is heavier than air.
Upon heating, toxic fumes are formed. The substance is a strong oxidant. It reacts violently with combustible and reducing materials. The substance reacts with most organic and inorganic compounds, causing fire and explosion hazard. Attacks metal, some forms of rubber, plastic and coatings. (ICSC 0107)
Conditions to avoid
Contact with incompatible materials.
Contact with fire source.
Incompatible materials
Reducing agents, Combustible materials, Organic compounds, Inorganic compounds
Hazardous decomposition products
Bromine compound

11. Toxicological Information

Information on toxicological effects
Acute toxicity
Acute toxicity (Oral)
[GHS Cat. Japan, base data]
(Bromine)
rat LD50=2600, 3100mg/kg (HSDB, 2014)
Acute toxicity (Inhalation)
[GHS Cat. Japan, base data]
(Bromine)
vapor: mouse LC50=120ppm/4hr
Irritant properties
Skin corrosion/irritation
[GHS Cat. Japan, base data]
(Bromine)
human extreme irritation (ACGIH 7th, 2001)
Serious eye damage/irritation
[GHS Cat. Japan, base data]
(Bromine)
severe eyes irritation (ACGIH 7th, 2001)

Allergenic and sensitizing effects data is not available.
Mutagenic effects data is not available.
Carcinogenic effects data is not available.
Reproductive toxicity data is not available.
STOT
STOT-single exposure
[cat.1]
[GHS Cat. Japan, base data]
(Bromine)
CNS; respiratory system (ACGIH 7th, 2001; PATTY 6th, 2012)
STOT-repeated exposure
[cat.1]
[GHS Cat. Japan, base data]
(Bromine)
nervous system; respiratory system/system; endocrine system (ACGIH 7th, 2001; PATTY 6th, 2012)
Aspiration hazard data is not available.

12. Ecological Information

Ecotoxicity
Aquatic toxicity
Very toxic to aquatic life
Very toxic to aquatic life with long lasting effects
Hazardous to the aquatic environment (Acute)
[GHS Cat. Japan, base data]
(Bromine)
Crustacea (Daphnia magna) LC50=1mg/L/48hr (Aquire, 2003)
Water solubility
(Bromine)
4.0 g/100 ml (20℃) (ICSC, 2009)
Persistence and degradability
Persistence and degradability data is not available.
Bioaccumulative potential
Bioaccumulative potential data is not available.
Mobility in soil
Mobility in soil data is not available.
Other adverse effects
Ozone depleting chemical data is not available.

13. Disposal considerations

Description of waste residues and information on their safe handling and methods of disposal, including the disposal of any contaminated packaging
Waste treatment methods
Avoid release to the environment (- if this is not the intended use).
Dispose of contents/container in accordance with local/national regulation.

14. Transport Information

UN No. or ID No.: 1744
UN Proper Shipping Name :
BROMINE or BROMINE SOLUTION
Class or division (Transport hazard class) : 8
Subsidiary hazard(s) : 6.1
Packing group : I
ERG GUIDE No.: 154

IMDG Code (International Maritime Dangerous Goods Regulations)

UN No.: 1744
Proper Shipping Name :
BROMINE or BROMINE SOLUTION
Class or division : 8
Subsidiary hazard(s) : 6.1
Packing group : I

IATA Dangerous Goods Regulations

UN No.: 1744
Proper Shipping Name :
BROMINE or BROMINE SOLUTION
Class or division : 8
Subsidiary hazard(s) : 6.1
Special provisions No.: A2

Environmental hazards

MARPOL Annex III – Prevention of pollution by harmful substances

Marine pollutants (yes/no) : yes

MARPOL Annex V – Prevention of pollution by garbage discharge

Specific target organ toxicity – repeated exposure: cat.1
Bromine
Hazardous to the aquatic environment – acute hazard: cat.1
Bromine
Hazardous to the aquatic environment – long-term hazard: cat.1, 2
Bromine

15. Regulatory Information

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

Chemicals listed in TSCA Inventory

Bromine

Other regulatory information

Ensure this material in compliance with federal requirements and ensure conformity to local regulations.

16. Other information

GHS classification and labelling

Corr. Met. 1: H290 May be corrosive to metals
Acute Tox. 2: H330 Fatal if inhaled
Skin Corr. 1: H314 Causes severe skin burns and eye damage
Eye Dam. 1: H318 Causes serious eye damage
STOT SE 1: H370 Causes damage to organs after single exposure
STOT RE 1: H372 Causes damage to organs through prolonged or repeated exposure
Aquatic Acute 1: H400 Very toxic to aquatic life
Aquatic Chronic 1: H410 Very toxic to aquatic life with long lasting effects

Reference Book

Globally Harmonized System of classification and labelling of chemicals, (7th revised edition, 2017), UN
Recommendations on the TRANSPORT OF DANGEROUS GOODS 20th edit., 2017 UN
IMDG Code, 2018 Edition (Incorporating Amendment 39-18)
IATA Dangerous Goods Regulations (61th Edition) 2020
Classification, labelling and packaging of substances and mixtures (Table 3 ECNO6182012)
2016 EMERGENCY RESPONSE GUIDEBOOK (US DOT)
2020 TLVs and BEIs. (ACGIH)
http://monographs.iarc.fr/ENG/Classification/index.php
Supplier's data/information

General Disclaimer

This data sheet was created based on the information we currently have and may be revised according to new information. In addition, the precautions apply only to normal handling, and in the case of special handling, please make adequate countermeasure to maintain your safety.
The data given here is based on current knowledge and experience. The purpose of this Safety Data Sheet is to describe the products in terms of their safety requirements. The data does not signify any warranty with regard to the products' properties.
The GHS classification data given here is based on current Japan official data (NITE published in 2019).