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ISO 9001: 2015

MATERIAL SAFETY DATA SHEET

Identification

1.1GHS Product identifier

Epichlorohydrin, 99%

Code E 1260

2.Hazard identification

2.1Classification of the substance or mixture

Flammable liquids, Category 3

Acute toxicity - Oral, Category 3

Acute toxicity - Dermal, Category 3

Skin corrosion, Category 1B

Skin sensitization, Category 1

Acute toxicity - Inhalation, Category 3

Carcinogenicity, Category 1B

2.2GHS label elements, including precautionary statements

Pictogram(s)



Signal word

Danger

Hazard statement(s)

H226 Flammable liquid and vapour
H301 Toxic if swallowed
H311 Toxic in contact with skin
H314 Causes severe skin burns and eye damage
H317 May cause an allergic skin reaction
H331 Toxic if inhaled
H350 May cause cancer

Precautionary statement(s)

Prevention

P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233 Keep container tightly closed.
P240 Ground and bond container and receiving equipment.
P241 Use explosion-proof [electrical/ventilating/lighting/...] equipment.
P242 Use non-sparking tools.
P243 Take action to prevent static discharges.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P264 Wash ... thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P260 Do not breathe dust/fume/gas/mist/vapours/spray.
P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
P272 Contaminated work clothing should not be

Response

allowed out of the workplace.
 P271 Use only outdoors or in a well-ventilated area.
 P201 Obtain special instructions before use.
 P202 Do not handle until all safety precautions have been read and understood.
 P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
 P370+P378 In case of fire: Use ... to extinguish.
 P301+P310 IF SWALLOWED: Immediately call a POISON CENTER/doctor/2026
 P321 Specific treatment (see ... on this label).
 P330 Rinse mouth.
 P302+P352 IF ON SKIN: Wash with plenty of water/...
 P312 Call a POISON CENTER/doctor/2026 if you feel unwell.
 P361+P364 Take off immediately all contaminated clothing and wash it before reuse.
 P301+P330+P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
 P363 Wash contaminated clothing before reuse.
 P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
 P310 Immediately call a POISON CENTER/doctor/2026
 P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
 P333+P313 If skin irritation or rash occurs: Get medical advice/attention.
 P362+P364 Take off contaminated clothing and wash it before reuse.
 P311 Call a POISON CENTER/doctor/2026
 P308+P313 IF exposed or concerned: Get medical advice/ attention.
 P403+P235 Store in a well-ventilated place. Keep cool.
 P405 Store locked up.
 P403+P233 Store in a well-ventilated place. Keep container tightly closed.
 P501 Dispose of contents/container to ...

Storage

Disposal

2.3 Other hazards which do not result in classification none

3. Composition/information on ingredients

3.1 Substances

Chemical name	Common names and synonyms	CAS number	EC number	Concentration
epichlorohydrin	epichlorohydrin	106-89-8	none	100%

4. First-aid measures

4.1 Description of necessary first-aid measures

General advice

Consult a physician. Show this safety data sheet to the doctor in attendance.

If inhaled

Fresh air, rest. Half-upright position. Artificial respiration may be needed. Refer immediately for medical attention.

In case of skin contact

Wear protective gloves when administering first aid. First rinse with plenty of water for at least 15 minutes, then remove contaminated clothes and rinse again. Put clothes in sealable container. Refer immediately for medical attention.

In case of eye contact

Rinse with plenty of water (remove contact lenses if easily possible). Refer immediately for medical attention.

If swallowed

Rinse mouth. Do NOT induce vomiting. Refer immediately for medical attention.

4.2 Most important symptoms/effects, acute and delayed

This compound is caustic as both a liquid and gas. Irritation of the eyes and skin, and skin sensitization has been observed. Exposure to epichlorohydrin has caused inflammation of the lungs, asthmatic bronchitis, and liver and kidney damage. In acute poisonings, death may be caused by respiratory paralysis. (EPA, 1998)

4.3 Indication of immediate medical attention and special treatment needed, if necessary

ACETYLCYSTEINE WAS USEFUL IN TREATING THE TOXIC SYMPTOMS IN RATS RESULTING FROM INHALATION OF EPICHLORHYDRIN. /SRP: CLINICAL EFFECTIVENESS NOT PROVEN/

5.Fire-fighting measures

5.1Extinguishing media

Suitable extinguishing media

Avoid use of dry chemical if fire occurs in container with confined vent. Containers may explode in fire because of polymerization.

5.2Specific hazards arising from the chemical

When heated to decomposition, this compound evolves highly toxic fumes of phosgene and carbon monoxide. Reactive and incompatible with strong oxidizers, strong acids, caustics, zinc, aluminum, chlorides of iron and aluminum and compounds with an active hydrogen atom, including water. Unstable, avoid heat, contaminants, strong acids and bases, certain curing agents such as ethylenediamine. Hazardous polymerization may occur. (EPA, 1998)

5.3Special protective actions for fire-fighters

Wear self-contained breathing apparatus for firefighting if necessary.

6.Accidental release measures

6.1Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation.

Evacuate personnel to safe areas. Avoid breathing dust. For personal protection see section 8.

6.2Environmental precautions

Evacuate danger area! Consult an expert! Personal protection: chemical protection suit including self-contained breathing apparatus. Do NOT let this chemical enter the environment. Do NOT wash away into sewer. Collect leaking and spilled liquid in sealable containers as far as possible. Absorb remaining liquid in sand or inert absorbent. Then store and dispose of according to local regulations.

6.3Methods and materials for containment and cleaning up

Remove all ignition sources. Ventilate area of spill or leak.

7.Handling and storage

7.1Precautions for safe handling

Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Avoid exposure - obtain special instructions before use. Provide appropriate exhaust ventilation at places where dust is formed. For precautions see section 2.2.

7.2Conditions for safe storage, including any incompatibilities

Fireproof. Separated from strong oxidants, acids, bases, aluminium, zinc, amines and food and feedstuffs. Well closed. Separate from acids, alkalis, salts, water, and oxidizers. Store in a cool, dry, well-ventilated location. Inside storage should be in a standard flammable liquids storage warehouse, room, or cabinet.

8.Exposure controls/personal protection

8.1Control parameters

Occupational Exposure limit values

NIOSH considers epichlorohydrin to be a potential occupational carcinogen.

NIOSH usually recommends that occupational exposures to carcinogens be limited to the lowest feasible concn.

Biological limit values

no data available

8.2Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

8.3Individual protection measures, such as personal protective equipment (PPE)

Eye/face protection

Safety glasses with side-shields conforming to EN166. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Wear impervious clothing. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace. Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands. The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.

Respiratory protection

Wear dust mask when handling large quantities.

Thermal hazards

no data available

9.Physical and chemical properties

Physical state clear, colorless

Colour Colorless liquid

Odour Odor is sweet, pungent or chloroform-like ...
generally perceived as a slightly irritating
chloroformlike odor

Melting point/ freezing point -26\u00b0C(lit.)

Boiling point or initial boiling point and

boiling range
Flammability Class IC Flammable Liquid: F.I.P. at or above 22.78°C and below 37.78°C. Flammable. Gives off irritating or toxic fumes (or gases) in a fire.
Lower and upper explosion limit / flammability limit Lower flammable limit: 3.8% and upper flammable limit: 21.0%.
Flash point 32°C (lit.)
Auto-ignition temperature 411.11°C (USCG, 1999)
Decomposition temperature no data available
pH no data available
Kinematic viscosity 0.0103 poise at 25°C
Solubility 50 to 100 mg/mL at 22.22°C
Partition coefficient n-octanol/water (log value) log Kow = 0.45
Vapour pressure 22mmHg at 25°C
Density and/or relative density 1.183
Relative vapour density 3.29 (EPA, 1998) (Relative to Air)
Particle characteristics no data available

10. Stability and reactivity

10.1 Reactivity

no data available

10.2 Chemical stability

Epichlorohydrin can be oxidized by free radical process in liquid or gas phases; these reactions may occur as photochemically initiated atmospheric reactions.

10.3 Possibility of hazardous reactions

Flammable liquid when exposed to heat or flame. 1-CHLORO-2,3-EPOXYPROPANE may polymerize exothermically if heated or contaminated. Reacts explosively with aniline. Ignites on contact with potassium tert-butoxide. Reacts with trichloroethylene to give the explosive dichloroacetylene. Violent reaction with sulfuric acid or isopropylamine. Exothermic polymerization on contact with strong acids or bases, zinc, aluminum, aluminum chloride, iron, ferric chloride [Sax, 9th ed., 1996, p. 1469].

10.4 Conditions to avoid

no data available

10.5 Incompatible materials

Strong oxidizers, strong acids, certain salts, caustics, zinc, aluminum, water [Note: May polymerize in presence of strong acids and bases particularly when hot.].

10.6 Hazardous decomposition products

When heated to decomp, emits toxic fumes of /hydrogen chloride/.

11. Toxicological information

Acute toxicity

Oral: LD50 Guinea pig oral 178 mg/kg

Inhalation: LC50 Rat inhalation 250 ppm/8 hr

Dermal: no data available

Skin corrosion/irritation

no data available

Serious eye damage/irritation

no data available

Respiratory or skin sensitization

no data available

Germ cell mutagenicity

no data available

Carcinogenicity

Cancer Classification: Group B2 Probable Human Carcinogen

Reproductive toxicity

In humans occupationally exposed to epichlorohydrin, effects on sperm counts, hormone levels, and fertility have been not detected. Epichlorohydrin has been demonstrated to reduce fertility in male rats when inhaled or administered orally. (-) Teratogenic effects (birth defects) have not been observed in studies of rodents exposed by inhalation or ingestion.

STOT-single exposure

no data available

STOT-repeated exposure

no data available

Aspiration hazard

no data available

12. Ecological information

12.1 Toxicity

Toxicity to fish: LC50; Species: Danio rerio (Zebra danio); Conditions: static; Concentration: 30500 ug/L for 96 hr /formulation
Toxicity to daphnia and other aquatic invertebrates: LC50; Species: Daphnia magna (Water flea); Conditions: static, 20-22°C, pH 7.6-7.7, oxygen saturated; Concentration: 30 mg/L for 24 hr /from table

Toxicity to algae: no data available

Toxicity to microorganisms: no data available

12.2 Persistence and degradability

AEROBIC: An unspecified amount of epichlorohydrin reached 18% of its theoretical BOD in 1 week using an activated sludge inoculum and the Japanese MITI test(1). Pure cultures were able to biodegrade epichlorohydrin rapidly to 3-chloro-1,2-propanediol(2). Epichlorohydrin achieved 3% of the theoretical BOD in a sewage sludge over a 5 day incubation period, but achieved 14% of the theoretical BOD following acclimation(3). Epichlorohydrin was 67% biodegraded in an activated sludge degradability test following a 1 day acclimation period(4).

12.3 Bioaccumulative potential

An estimated BCF of 3 was calculated for epichlorohydrin(SRC), using a log Kow of 0.45(1) and a regression-derived equation(2). According to a classification scheme(3), this BCF suggests the potential for bioconcentration in aquatic organisms is low.

12.4 Mobility in soil

The Koc of epichlorohydrin is estimated as 40(SRC), using a log Kow of 0.45(1) and a regression-derived equation(2). According to a classification scheme(3), this estimated Koc value suggests that epichlorohydrin is expected to have very high mobility in soil(SRC).

12.5 Other adverse effects

no data available

13. Disposal considerations

13.1 Disposal methods

Product

The material can be disposed of by removal to a licensed chemical destruction plant or by controlled incineration with flue gas scrubbing. Do not contaminate water, foodstuffs, feed or seed by storage or disposal. Do not discharge to sewer systems.

Contaminated packaging

Containers can be triply rinsed (or equivalent) and offered for recycling or reconditioning. Alternatively, the packaging can be punctured to make it unusable for other purposes and then be disposed of in a sanitary landfill. Controlled incineration with flue gas scrubbing is possible for combustible packaging materials.

14. Transport information

14.1 UN Number

ADR/RID: UN2023 IMDG: UN2023 IATA: UN2023

14.2 UN Proper Shipping Name

ADR/RID: EPICHLOROXYDRIN

IMDG: EPICHLOROXYDRIN

IATA: EPICHLOROXYDRIN

14.3 Transport hazard class(es)

ADR/RID: 6.1 IMDG: 6.1 IATA: 6.1

14.4 Packing group, if applicable

ADR/RID: II IMDG: II IATA: II

14.5 Environmental hazards

ADR/RID: no IMDG: no IATA: no

14.6 Special precautions for user

no data available

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

no data available

15. Regulatory information

15.1 Safety, health and environmental regulations specific for the product in question

Chemical name	Common names and synonyms	CAS number	EC number
epichlorohydrin	epichlorohydrin	106-89-8	none
European Inventory of Existing Commercial Chemical Substances (EINECS)			Listed.
EC Inventory			Listed.
United States Toxic Substances Control Act (TSCA) Inventory			Listed.
China Catalog of Hazardous chemicals 2015			Listed.
New Zealand Inventory of Chemicals (NZIoC)			Listed.
Philippines Inventory of Chemicals and Chemical Substances (PICCS)			Listed.
Vietnam National Chemical Inventory			Listed.
Chinese Chemical Inventory of Existing Chemical Substances (China IECSC)			Listed.

Section 16: Other Information

This safety data sheet should be used in conjunction with technical sheets. It does not replace them. The information given is based on our knowledge of this product, at the time of publication. It is given in good faith. The attention of the user is drawn to the possible risks incurred by using the product for any other purpose other than that for which it was intended. This does not in any way excuse the user from knowing and applying all the regulations governing his activity. It is the sole responsibility of the user to take all precautions required in handling the product. The aim of the mandatory regulations mentioned is to help the user to fulfill his obligations regarding the use of hazardous products.

