



TCI AMERICA

SAFETY DATA SHEET

Revision number: 2
Revision date: 10/06/2014

1. IDENTIFICATION

Product name: (S)-Epichlorohydrin
Product code: E0533

Product use: For laboratory research purposes.
Restrictions on use: Not for drug or household use.

Company:
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TCI America (8:00am - 5:00pm) PST
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2. HAZARD(S) IDENTIFICATION

OSHA Haz Com: CFR 1910.1200:
Acute Toxicity - Oral [Category 3]
Acute Toxicity - Dermal [Category 3]
Acute Toxicity - Inhalation [Category 2]
Eye Damage/Irritation [Category 1]
Sensitization - Respiratory [Category 1]
Sensitization - Skin [Category 1]
Germ Cell Mutagenicity [Category 2]
Carcinogenicity [Category 1B]
Toxic to Reproduction [Category 2]
Specific Target Organ Toxicity (Single Exposure) [Category 1]
Specific Target Organ Toxicity (Repeated Exposure) [Category 1]
Flammable Liquids [Category 3]
Aquatic Hazard (Acute) [Category 3]
Skin Corrosion/Irritation [Category 1B]

Signal word: Danger!

Hazard Statement(s):
Causes serious eye damage
Causes severe skin burns and eye damage
Fatal if inhaled
Flammable liquid and vapor
May cause allergy or asthma symptoms or breathing difficulties if inhaled
May cause an allergic skin reaction
May cause cancer
Suspected of causing genetic defects
Suspected of damaging fertility or the unborn child
Toxic if swallowed
Toxic in contact with skin
Harmful to aquatic life
Causes damage to: Liver Respiratory System Kidney Central Nervous System
Causes damage to organs: Liver Respiratory System Heart Kidney Central Nervous System Lung through prolonged or repeated exposure.

Pictogram(s) or Symbol(s):



2. HAZARD(S) IDENTIFICATION**Precautionary Statement(s):****[Prevention]**

Do not eat, drink or smoke when using this product. Wash hands and face thoroughly after handling. Wear protective gloves and protective clothing. Do not breathe fume, mist, vapors or spray. Use only outdoors or in a well-ventilated area. In case of inadequate ventilation wear respiratory protection. Do not breathe dusts or mists. Wear protective gloves, protective clothing, eye protection and face protection. Wear eye protection. Wear face protection (full length face shield). Avoid breathing dusts or mists. Contaminated work clothing must not be allowed out of the workplace. Wear protective gloves. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Keep away from heat, sparks, open flames or other hot surfaces. - No smoking. Keep container tightly closed. Ground or bond container and receiving equipment. Use explosion-proof electrical, ventilating, lighting, and equipment. Use only non-sparking tools. Take precautionary measures against static discharge. Wear protective gloves, eye protection and face protection.

[Response]

If swallowed: Immediately call a poison center or doctor. Rinse mouth. If on skin: Wash with plenty of water. Call a poison center or doctor if you feel unwell. Take off immediately all contaminated clothing and wash it before reuse. If inhaled: Remove person to fresh air and keep comfortable for breathing. Immediately call a poison center or doctor. If swallowed: Rinse mouth. Do NOT induce vomiting. If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water or 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 breathing is difficult, remove person to fresh air and keep comfortable for breathing. If experiencing respiratory symptoms: Call a poison center or doctor. If skin irritation occurs: Get medical advice/attention. If exposed: Call a poison center or doctor. If exposed or concerned: Get medical advice or attention. Get medical advice or attention if you feel unwell. In case of fire: Use dry chemical, CO₂, water spray or alcohol-resistant foam to extinguish.

[Storage]

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

[Disposal]

Dispose of contents and container in accordance with US EPA guidelines for the classification and determination of hazardous waste listed in 40 CFR 261.3. (See Section 13)

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance/Mixture:	Substance
Components:	(S)-Epichlorohydrin
Percent:	>98.0%(GC)
CAS Number:	67843-74-7
Molecular Weight:	92.52
Chemical Formula:	C ₃ H ₅ ClO
Synonyms:	(S)-Chloromethyloxirane , (S)-3-Chloropropylene Oxide , (S)-1-Chloro-2,3-epoxypropane

4. FIRST-AID MEASURES**Inhalation:**

May cause coughing, difficult breathing and nausea. Immediately call a poison center or doctor. Effects of exposure (inhalation) to substance may be delayed. Inhalation of vapors or contact with substance will result in contamination and potential harmful effects. Move victim to fresh air. Give artificial respiration if victim is not breathing. Administer oxygen if breathing is difficult. Keep victim warm and quiet. Treat symptomatically and supportively. Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.

Skin contact:

For severe burns, immediate medical attention is required. Immediately call a poison center or doctor. Effects of exposure (skin contact) to substance may be delayed. Remove and wash contaminated clothing before re-use. Remove and isolate contaminated clothing and shoes. In case of contact with substance, immediately flush skin with running water for at least 20 minutes. Treat symptomatically and supportively. Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.

Eye contact:

IMMEDIATELY flush eyes with running water for at least 15 minutes, keeping eyelids open. Eye contact with vapors or substance may cause severe injury, burns, or death. Call emergency medical service. Move victim to fresh air. Check for and remove any contact lenses. Keep victim warm and quiet. Treat symptomatically and supportively. Effects of exposure to substance may be delayed. Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.

Ingestion:

Toxic if swallowed. Do not induce vomiting with out medical advice. Effects of exposure (ingestion) to substance may be delayed. Call a physician or Poison Control Center immediately. Do not use mouth-to-mouth method if victim ingested the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Loosen tight clothing such as a collar, tie, belt or waistband. If a person vomits place them in the recovery position so that vomit will not reenter the mouth and throat. Rinse mouth. Keep victim warm and quiet. Treat symptomatically and supportively. Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.

4. FIRST-AID MEASURES**Symptoms/effects:**

Acute:	Pain. Redness.
Delayed:	May cause heritable genetic damage in humans. May cause skin sensitization. Possibly carcinogenic to humans.

Immediate medical attention:

WARNING: It might be dangerous to the person providing aid to give mouth-to-mouth respiration, because the inhaled material is toxic. WARNING: It might be hazardous to the person providing aid to give mouth-to-mouth respiration, because the inhaled material is corrosive. CAUTION: Victim may be a source of contamination. For severe burns, immediate medical attention is required. If breathing has stopped, perform artificial respiration. Use first aid treatment according to the nature of the injury. Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.

5. FIRE-FIGHTING MEASURES**Suitable extinguishing media:**

Dry chemical, CO₂ or water spray. Consult with local fire authorities before attempting large scale fire fighting operations.

Specific hazards arising from the chemical**Hazardous combustion products:**

These products include: Carbon oxides Halogenated compounds

Other specific hazards:

WARNING: Highly toxic HCl gas is produced during combustion.

Special precautions for fire-fighters:

Use water spray or fog; do not use straight streams. Dike fire-control water for later disposal; do not scatter the material. CAUTION: All these products have a very low flash point: Use of water spray when fighting fire may be inefficient. Do not use straight streams. Runoff to sewer may create fire or explosion hazard. Containers may explode when heated. Move containers from fire area if you can do it without risk.

Special protective equipment for fire-fighters:

Wear positive pressure self-contained breathing apparatus (SCBA). Structural fire fighters' protective clothing provides limited protection in fire situations ONLY; it may not be effective in spill situations. Wear chemical protective clothing which is specifically recommended by the manufacturer. It may provide little or no thermal protection.

6. ACCIDENTAL RELEASE MEASURES**Personal precautions:**

Avoid contact with skin, eyes, and clothing. Keep people away from and upwind of spill/leak. Use spark-proof tools and explosion-proof equipment. Remove all sources of ignition. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing (Section 8). Warn unnecessary personnel to move away. Stop leak if you can do it without risk. Ensure adequate ventilation. Isolate the hazard area and deny entry to unnecessary and unprotected personnel.

Personal protective equipment:

Wear eye protection (splash goggles) and face protection (full length face shield). Wear protective clothing (chemical resistant suit and chemical resistant boots). Vapor respirator. Be sure to use a MSHA/NIOSH approved respirator or equivalent. Wear protective gloves (nitrile).

Emergency procedures:

Isolate area until gas has dispersed. Do not clean-up or dispose except under supervision of a specialist. In case of a spill and/or a leak, always shut off any sources of ignition, ventilate the area, and exercise caution. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Warn personnel to move away. Prevent entry into sewers, basements or confined areas; dike if needed.

Methods and materials for containment and cleaning up:

ELIMINATE all ignition sources (no smoking, flares, sparks, or flames in immediate area). All equipment used when handling the product must be grounded. Stop leak if without risk. Ventilate the area. Absorb with an inert material and put the spilled material in an appropriate waste disposal container. Use clean non-sparking tools to collect absorbed material. Dike far ahead of spill; use dry sand to contain the flow of material.

Environmental precautions:

Keep away from living quarters. Environmental hazard. Do not let product enter drains. Prevent further leakage or spillage if safe to do so. Water runoff can cause environmental damage. Prevent entry into sewers, basements or confined areas; dike if needed.

7. HANDLING AND STORAGE**Precautions for safe handling:**

Do NOT breath gas, fumes, vapor, or spray. Manipulate under an adequate fume hood. Do not ingest. Avoid contact with skin and eyes. Avoid contact with skin. Avoid contact - obtain special instructions before use. Avoid prolonged or repeated exposure. Normal measures for preventive fire protection. Avoid exposure - obtain special instructions before use. Keep away from heat and sources of ignition. Use explosion-proof equipment. Use only non-sparking hand tool when handling this product. Ground all equipment containing material. Take measures to prevent build up of electrostatic charge. Good general ventilation should be sufficient to control airborne levels. Keep container dry. Handle and open container with care. Wear suitable protective clothing, gloves and eye/face protection. When using do not eat, drink, or smoke. Keep away from sources of ignition.

Conditions for safe storage:

Store locked up. Keep containers tightly closed in a cool, well-ventilated place. Keep away from sources of ignition. Store and use away from heat, sparks, open flame, or any other ignition source. Keep away from incompatibles. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Avoid prolonged storage periods. Store under inert gas (e.g. Argon). Moisture sensitive.

7. HANDLING AND STORAGE**Storage incompatibilities:** Store away from oxidizing agents**8. EXPOSURE CONTROLS / PERSONAL PROTECTION****Exposure limits:** No data available**Appropriate engineering controls:**

Handle only in a fully enclosed system and equipment. Good general ventilation should be sufficient to control airborne levels. Ventilation is normally required when handling or using this product. Eyewash fountains should be provided in areas where there is any possibility that workers could be exposed to the substance. Follow safe industrial engineering/laboratory practices when handling any chemical.

Personal protective equipment

Respiratory protection: Vapor respirator. Be sure to use a MSHA/NIOSH approved respirator or equivalent.
Hand protection: Wear protective gloves.
Eye protection: Splash goggles.
Skin and body protection: Wear protective clothing (chemical resistant suit and chemical resistant boots).

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state (20°C): Liquid
Form: Clear
Color: Colorless - Slightly pale yellow
Odor: No data available
Odor threshold: 0.93 ppm

Melting point/freezing point:	No data available	pH:	No data available
Boiling point/range:	112°C (234°F)	Vapor pressure:	1.73kPa/20°C
Decomposition temperature:	No data available	Vapor density:	3.18
Relative density:	1.18	Dynamic Viscosity:	No data available
Kinematic Viscosity:	No data available	Evaporation rate:	No data available (Butyl Acetate = 1)
Partition coefficient:	No data available	Autoignition temperature:	420°C (788°F)
n-octanol/water (log P_{ow}):	No data available	Flammability or explosive limits:	
Flash point:	34°C (93°F)	Lower:	3.8%
Flammability (solid, gas):	No data available	Upper:	21%

Solubility(ies):**Water:** Soluble (6.58%, 20°C)**Soluble:** Ether, Alcohols**10. STABILITY AND REACTIVITY**

Reactivity: Not Available.
Chemical Stability: Moisture sensitive.
Possibility of Hazardous Reactions: In use, may form flammable/explosive vapor-air mixture.
Conditions to avoid: Exposure to moisture. Moisture sensitive.
Incompatible materials: Oxidizing agents
Hazardous Decomposition Products: No data available

11. TOXICOLOGICAL INFORMATION**RTECS Number:** RR0427100

Acute Toxicity:
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:
cyt-mus-ipr 100 mg/kg
oms-mus-ipr 100 mg/kg
mms-sat 800 nmol/plate (+S9)

Carcinogenicity:
No data available

IARC: Group 2A (Probably carcinogenic to humans). **NTP:** No data available **OSHA:** No data available

Reproductive toxicity:
ihl-rat TCLo: 50 ppm/6H(50D male)

Routes of Exposure: Inhalation, Eye contact, Ingestion, Skin contact.

Symptoms related to exposure:
Overexposure may result in serious illness or death. Skin contact may produce burns. Skin contact may result in inflammation; characterized by itching, scaling, reddening, or occasionally blistering. Eye contact can result in corneal damage or blindness. Inhalation causes irritation of the lungs and respiratory system. Skin contact may result in sensitization. Readily absorbed through skin.

Potential Health Effects:
No specific information available; skin and eye contact may result in irritation. May be harmful if inhaled or ingested.

Target organ(s):
Causes damage to: Liver Respiratory System Kidney Central Nervous System
Causes damage to organs: Liver Respiratory System Heart Kidney Central Nervous System Lung through prolonged or repeated exposure.

12. ECOLOGICAL INFORMATION

Ecotoxicity
Fish: No data available
Crustacea: No data available
Algae: No data available

Persistence and degradability: No data available
Bioaccumulative potential (BCF): No data available
Mobility in soil: No data available
Partition coefficient: n-octanol/water (log P_{ow}) No data available
Soil adsorption (K_{oc}): No data available
Henry's Law constant (PaM³/mol) No data available

13. DISPOSAL CONSIDERATIONS

Disposal of product: Recycle to process if possible. It is the generator's responsibility to comply with Federal, State and Local rules and regulations. You may be able to dissolve or mix material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber system. This section is intended to provide assistance but does not replace these laws, nor does compliance in accordance with this section ensure regulatory compliance according to the law. US EPA guidelines for Identification and Listing of Hazardous Waste are listed in 40 CFR Parts 261. The product should not be allowed to enter the environment, drains, water ways, or the soil.
Disposal of container: Dispose of as unused product. Do not re-use empty containers.
Other considerations: Observe all federal, state and local regulations when disposing of the substance.

14. TRANSPORT INFORMATION

DOT (US)

14. TRANSPORT INFORMATION

UN number: UN2023	Proper Shipping Name: Epichlorohydrin	Class or Division: 6.1 Toxic material.	Subrisk(s): 3 Flammable liquid	Packing Group: II
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IATA				
UN number: UN2023	Proper Shipping Name: Epichlorohydrin	Class or Division: 6.1 Toxic material.	Subrisk(s): 3 Flammable liquid	Packing Group: II

IMDG				
UN number: UN2023	Proper Shipping Name: Epichlorohydrin	Class or Division: 6.1 Toxic material.	Subrisk(s): 3 Flammable liquid	Packing Group: II

Marine Pollutant:	Marine Pollutant
EmS number:	F-E, S-D
Reportable Quantity:	100 Pounds (45.4 Kilograms)

15. REGULATORY INFORMATION**Toxic Substance Control Act (TSCA 8b.):**

This product is NOT on the EPA Toxic Substances Control Act (TSCA) inventory. The following notices are required by 40 CFR 720.36 (C) for those products not on the inventory list:

- (i) These products are supplied solely for use in research and development by or under the supervision of a technically qualified individual as defined in 40 CFR 720.0 et sec.
(ii) The health risks of these products have not been fully determined. Any information that is or becomes available will be supplied on a SDS sheet.

US Federal Regulations**CERCLA Hazardous substance and Reportable Quantity:**

SARA 313:	Not Listed
SARA 302:	Not Listed

State Regulations**State Right-to-Know**

Massachusetts	Not Listed
New Jersey	Not Listed
Pennsylvania	Not Listed
California Proposition 65:	Not Listed

Other Information**NFPA Rating:**

Health:	4
Flammability:	3
Instability:	0

HMIS Classification:

Health:	4
Flammability:	3
Physical:	0

International Inventories

WHMIS hazard class:	B2: Flammable Liquid. D1A: Materials causing immediate and serious toxic effects. (Very Toxic) D1B: Materials causing immediate and serious toxic effects. (Toxic) D2B: Materials causing other toxic effects. (Toxic)
EC-No:	482-080-0

16. OTHER INFORMATION

Revision date: 10/06/2014
Revision number: 2

16. OTHER INFORMATION

TCI chemicals are for research purposes only and are NOT intended for use as drugs, food additives, households, or pesticides. The information herein is believed to be correct, but does not claim to be all inclusive and should be used only as a guide. Neither the above named supplier nor any of its affiliates or subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All chemical reagents must be handled with the recognition that their chemical, physiological, toxicological, and hazardous properties have not been fully investigated or determined. All chemical reagents should be handled only by individuals who are familiar with their potential hazards and who have been fully trained in proper safety, laboratory, and chemical handling procedures. Although certain hazards are described herein, we can not guarantee that these are the only hazards which exist. Our SDS are based only on data available at the time of shipping and are subject to change without notice as new information is obtained. Avoid long storage periods since the product is subject to degradation with age and may become more dangerous or hazardous. It is the responsibility of the user to request updated SDS for products that are stored for extended periods. Disposal of unused product must be undertaken by qualified personnel who are knowledgeable in all applicable regulations and follow all pertinent safety precautions including the use of appropriate protective equipment (e.g. protective goggles, protective clothing, breathing equipment, face mask, fume hood). For proper handling and disposal, always comply with federal, state and local regulations.