

MATERIAL SAFETY DATA SHEET

NFPA	HMIS	Personal Protective Equipment
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Health Hazard	3
Fire Hazard	1
Reactivity	0



See Section 8.

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product code:	T2724
Product Name:	TRIS(2-CARBOXYETHYL)PHOSPHINE HYDROCHLORIDE
Chemical Name:	No information available
Synonyms:	3,3',3"-Phosphinidynetripionic Acid Hydrochloride TCEP
Recommended use:	No information available.
CAS #:	51805-45-9
Formula:	C9-H15-O6-P.HCl
RTECS #	Not available
CI#:	Not available
Supplier:	Spectrum Chemicals and Laboratory Products, Inc. 14422 South San Pedro St. Gardena, CA 90248 (310) 516-8000
Emergency Telephone Number:	CHEMTREC: 1-800-424-9300
Contact Person:	Martin LaBenz (West Coast)
Contact Person:	Chris Terpak (East Coast)

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW			
DANGER CORROSIVE!. The product causes burns of eyes, skin and mucous membranes.			
Odor: No information available. None.	Physical state: Solid.	Appearance: Powder. Crystalline powder. Crystalline.	Color: White.

OSHA Regulatory Status This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200)

2. HAZARDS IDENTIFICATION

POTENTIAL HEALTH EFFECTS

Principal Routes of Exposure:

Skin. Inhalation. Ingestion.

Acute Potential Health Effects:**Skin Contact:**

Causes skin burns.

Eye Contact:

Causes eye burns.

Inhalation:

Causes chemical burns to the respiratory tract.

Ingestion:

Causes burns. Can burn mouth, throat, and stomach. May cause central nervous system effects. May affect respiration.

Chronic Potential Health Effects:**Component**

Tris(2-carboxyethyl)phosphine
Hydrochloride
51805-45-9 (100)

Carcinogen Status:

No information available

Target Organs:

No information available

Teratogenic Effects:

No information available

Mutagenic Effects:

No information available

Aggravated Medical Conditions: No information available

See Section 11 for additional Toxicological Information

POTENTIAL ENVIRONMENTAL EFFECTS

No information available

3. COMPOSITION/INFORMATION ON INGREDIENTS

Components	CAS-No.	Weight %
Tris(2-carboxyethyl)phosphine Hydrochloride	51805-45-9	100

4. FIRST AID MEASURES

General Advice:

Poison information centres in each State capital city can provide additional assistance for scheduled poisons (13 1126). Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves. First aider needs to protect himself.

Product code: T2724

Product name: TRIS(2-CARBOXYETHYL)PHOSPHINE
HYDROCHLORIDE

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Skin Contact: Wash off immediately with soap and plenty of water. Continue flushing with plenty of water for at least 15 minutes. Remove all contaminated clothes and shoes. Immediate medical attention is required. Call a physician immediately.

Eye Contact: Flush eye with water for 15 minutes. Immediate medical attention is required. Call a physician immediately.

Inhalation: Move to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. **WARNING!** It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled or ingested material is toxic, infectious or corrosive. Do not use mouth-to-mouth resuscitation if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Immediate medical attention is required. Call a physician immediately.

Ingestion: Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. Immediate medical attention is required. Call a physician or Poison Control Centre immediately.

Notes to Physician: Treat symptomatically

5. FIRE-FIGHTING MEASURES

Flammable Properties

Flashpoint (°C/°F):	No information available.
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Tested according to: Not available
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Lower Explosion Limit (%):	No information available
Upper Explosion Limit (%):	No information available

Autoignition Temperature (°C/°F):	Not applicable.
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Suitable Extinguishing Media: Carbon dioxide (CO₂). Dry chemical. Water spray mist or foam. Alcohol-resistant foam.

Unsuitable Extinguishing Media: No information available.

Hazardous Combustion Products: Carbon oxides, Phosphorus oxides, Hydrogen chloride

Specific hazards: May be combustible at high temperatures. Fire may produce irritating, corrosive and/or toxic gases.

Special Protective Equipment for Firefighters: As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear

Specific Methods: Water mist may be used to cool closed containers. Dike fire-control water for later disposal; do not scatter the material. For larger fires, use water spray or fog. Cool containers with flooding quantities of water until well after fire is out.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions:

Keep people away from and upwind of spill/leak. Ensure adequate ventilation. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Use personal protective equipment. Avoid contact with skin, eyes and clothing. Remove all sources of ignition. Avoid dust formation.

Environmental Precautions:

Prevent further leakage or spillage if safe to do so. Should not be released into the environment. Do not let product enter drains. Do not flush into surface water or sanitary sewer system. Prevent entry into waterways, sewers, basements or confined areas.

Methods for Cleaning Up:

Sweep up and shovel into suitable containers for disposal. Clean contaminated surface thoroughly.

7. HANDLING AND STORAGE

Handling**Technical Measures/Precautions:**

Use only in area provided with appropriate exhaust ventilation. Avoid dust formation. All equipment used when handling the product must be grounded. Keep away from incompatible materials.

Safe Handling Advice:

Wear personal protective equipment. Avoid contact with skin, eyes and clothing. Avoid dust formation. Keep away from heat and sources of ignition. Do not ingest. Do not breathe vapours/dust. Handle in accordance with good industrial hygiene and safety practice.

Storage**Technical Measures/Storage Conditions:**

Keep container tightly closed in a dry and well-ventilated place. Store at room temperature in the original container. Store in a segregated and approved area. Store away from incompatible materials.

Incompatible Products:

Oxidizing agents.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering measures to reduce exposure: Ensure adequate ventilation, especially in confined areas.

Personal Protective Equipment

Eye protection: Safety glasses

Skin and body protection: Usual safety precautions while handling the product will provide adequate protection against this potential effect.

Respiratory protection: Suitable respiratory equipment:

Hygiene measures: Avoid contact with skin, eyes and clothing.

National occupational exposure limits**United States**

Components	OSHA	NIOSH	ACGIH	AIHA WHEEL
Tris(2-carboxyethyl)phosphine Hydrochloride - 51805-45-9	None	None	None	None

Canada

Components	Alberta	British Columbia	Ontario	Quebec
Tris(2-carboxyethyl)phosphine Hydrochloride 51805-45-9	None	None	None	None

Australia and Mexico

Components	Australia	Mexico
Tris(2-carboxyethyl)phosphine Hydrochloride 51805-45-9	None	None

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state:

Solid.

Appearance:

Powder. Crystalline powder. Crystalline.

Color:

White.

Odor:

No information available. None.

Taste

No information available

Molecular/Formula weight:

286.65

Flash point (°C):

Not applicable

Lower Explosion Limit (%):

Not applicable

Upper Explosion Limit (%):

Not applicable

Autoignition Temperature (°C/°F):

No information available

pH:

No information available

Melting point/range(°C/°F):

177 °C/350.6 °F

Boiling point/range(°C/°F):

No information available

Decomposition temperature(°C/°F):

No information available

Specific gravity:

No information available

Density (g/cm³):

1.041 @ 25 °C

Bulk density:

No information available

Vapor pressure @ 20°C (kPa):

No information available

Evaporation rate:

No information available

Vapor density:

No information available

VOC content (g/L):

No information available

Odor threshold (ppm):

No information available

Partition coefficient**(n-octanol/water):**

No information available

Miscibility:

No information available

Solubility:

Very soluble in water

10. STABILITY AND REACTIVITY

Stability:

Stable at normal conditions

Conditions to avoid:

Heat. Avoid dust formation. Dust may form explosive mixture in air. Fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard.

Materials to avoid:

Strong oxidising agents.

Hazardous decomposition products:

Carbon monoxide. Carbon dioxide. Hydrogen chloride gas. Phosphorus oxides and/or phosphine.

Possibility of Hazardous Reactions:

No information available

Polymerization: Hazardous polymerisation does not occur

Corrosivity: No information available

Special Remarks on Corrosivity: No information available

11. TOXICOLOGICAL INFORMATION

Acute Toxicity

Component Information

Tris(2-carboxyethyl)phosphine Hydrochloride - 51805-45-9

- LD50/oral/rat = No information available
- LD50/oral/mouse = No information available
- LD50/dermal/rabbit = No information available
- LD50/dermal/rat = No information available
- LC50/inhalation/rat = No information available
- LC50/inhalation/mouse = No information available
- Other LD50 or LC50 information = No information available

Product Information

- LC50/inhalation/rat = No information available
- LC50/Inhalation/mouse = No information available
- LD50/dermal/rabbit = No information available
- LD50/dermal/rat = No information available
- LD50/oral/mouse = No information available

LD50/oral/rat = No information available

Local Effects

Skin irritation: Severe skin irritation. Causes burns.

Eye irritation: Severe eye irritation. Causes burns.

Inhalation: Causes chemical burns to the respiratory tract. May cause headache. May cause nausea, vomiting. Symptoms may include burning sensation, coughing, wheezing, laryngitis, shortness of breath. Inhalation may be fatal as a result of spasm, inflammation and edema of the larynx and bronchi, chemical pneumonitis, and pulmonary edema..

Ingestion: Causes digestive or gastrointestinal tract burns. May affect behavior/central nervous system (twitching, convulsions). May cause flaccid paralysis of the skeletal muscle.

Sensitization: No information available

Chronic Toxicity

Chronic Toxicity No information available

Carcinogenic effects: Not considered carcinogenic

Components	NTP	IARC	OSHA HCS - Carcinogens	ACGIH - Carcinogens	Australia - Prohibited Carcinogenic Substances	Australia - Notifiable Carcinogenic Substances
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Tris(2-carboxyethyl)phosphine Hydrochloride	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed
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Mutagenic Effects: No information available

Reproductive Effects: No information available

Teratogenic Effects: No information available

Target Organs: No information available

12. ECOLOGICAL INFORMATION

ECOTOXICITY

Toxicity to terrestrial and aquatic plants and animals: No information available

Ecotoxicity effects: No data available.

Aquatic toxicity: No information available

Mobility: No information available

Persistence and degradability: No information available

Bioaccumulative potential: No information available

13. DISPOSAL CONSIDERATIONS

Waste from residues / unused products:

Waste must be disposed of in accordance with Federal, State and Local regulation.

Contaminated packaging:

Empty containers should be taken for local recycling, recovery or waste disposal

Components	RCRA - F Series Wastes	RCRA - K Series Wastes	RCRA - P Series Wastes	RCRA - U Series Wastes
Tris(2-carboxyethyl)phosphine Hydrochloride	None	None	None	None

14. TRANSPORT INFORMATION

DOT

UN-No: UN3261
Proper Shipping Name: Corrosive solid, acidic, organic, n.o.s. (tris(2-carboxyethyl)phosphine Hydrochloride)
Hazard Class: 8
Packing Group: II
Subsidiary Risk: Not applicable
Marine Pollutant: No data available
ERG No: 154
DOT RQ (lbs): No information available
Symbol(s): G

TDG (Canada)

UN-No: UN3261
Proper Shipping Name: Corrosive solid, acidic, organic, n.o.s.
Hazard Class: 8

Product code: T2724

Product name: TRIS(2-CARBOXYETHYL)PHOSPHINE HYDROCHLORIDE

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Packing Group: II
Subsidiary Risk: No information available
Description: No information available

ADR

UN-No: UN3261
Proper Shipping Name: Corrosive solid, acidic, organic, n.o.s.
Hazard Class: 8
Packing Group: II
Subsidiary Risk: No information available
Classification Code: No information available
Description: No information available
CEFIC Tremcard No: No information available

IMO / IMDG

UN-No: UN3261
Proper Shipping Name: Corrosive solid, acidic, organic, n.o.s.
Hazard Class: 8
Packing Group: II
Subsidiary Risk: No information available
Description: No information available
IMDG Page: No information available
Marine Pollutant: No information available
EMS: F-A
MFAG: No information available
Maximum Quantity: No information available

RID

UN-No: UN3261
Proper Shipping Name: Corrosive solid, acidic, organic, n.o.s.
Hazard Class: 8
Packing Group: II
Subsidiary Risk: 8
Classification Code: No information available
Description: No information available

ICAO

UN-No: UN3261
Proper Shipping Name: Corrosive solid, acidic, organic, n.o.s.
Hazard Class: 8
Packing Group: II
Subsidiary Risk: No information available
Description: No information available

IATA

UN-No: UN3261
Proper Shipping Name: Corrosive solid, acidic, organic, n.o.s.
Hazard Class: 8
Packing Group: II
Subsidiary Risk: No information available
ERG Code: 8L
Description: No information available

15. REGULATORY INFORMATION

International Inventories

Product code: T2724

Product name: TRIS(2-CARBOXYETHYL)PHOSPHINE
HYDROCHLORIDE

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Components	U.S. TSCA	Philippines (PICCS)	KOREA KECL	Japan ENCS	CHINA	Australia (AICS)	EINECS-No.
Tris(2-carboxyethyl)phosphine Hydrochloride	Not Listed	Not present	Not present	Not present	Not present	Not present	Not present

U.S. Regulations

California Prop. 65: Safe Drinking Water and Toxic Enforcement Act of 1986.

Chemicals Known to the State of California to Cause Cancer:

This product does not contain a chemical requiring a warning under California Prop. 65. (See table below)

Chemicals Known to the State of California to Cause Reproductive Toxicity:

This product does not contain a chemical requiring a warning under California Prop. 65. (See table below)

Components	Carcinogen	Developmental Toxicity	Male Reproductive Toxicity	Female Reproductive Toxicity:
Tris(2-carboxyethyl)phosphine Hydrochloride	Not Listed	Not Listed	Not Listed	Not Listed

CERCLA/SARA

Components	CERCLA - Hazardous Substances and their Reportable Quantities	Section 302 Extremely Hazardous Substances and TPQs	Section 302 Extremely Hazardous Substances and RQs	Section 313 - Chemical Category	Section 313 - Reporting <i>de minimis</i>
Tris(2-carboxyethyl)phosphine Hydrochloride	None	None	None	None	None

U.S. TSCA

Components	TSCA Section 5(a)2 - Chemicals With Significant New Use Rules (SNURS)	TSCA 8(d) -Health and Safety Reporting
Tris(2-carboxyethyl)phosphine Hydrochloride	Not Applicable	Not Applicable

Canada

WHMIS hazard class:

E Corrosive material

Canada Controlled Products Regulation:

This product has been classified according to the hazard criteria of the CPR (Controlled Products Regulation) and the MSDS contains all of the information required by the CPR.

Inventory

Components	Canada (DSL)	Canada (NDSL)
Tris(2-carboxyethyl)phosphine Hydrochloride	Not Listed	Not Listed

Components	CEPA Schedule I - Toxic Substances	CEPA - 2010 Greenhouse Gases Subject to Mandatory Reporting
Tris(2-carboxyethyl)phosphine Hydrochloride	Not listed	Not listed

Product code: T2724

Product name: TRIS(2-CARBOXYETHYL)PHOSPHINE HYDROCHLORIDE

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EU Classification**R -phrase(s)**

R34 - Causes burns.

S -phrase(s)

S45 - In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection.

The product is classified in accordance with Annex VI to Directive 67/548/EEC**Indication of danger:**

C - Corrosive.

**16. OTHER INFORMATION****The MSDS format complies with ANSI Z400.1-2004 standards.**

Preparation Date	18-Jan-2012
Reason for revision:	Not applicable
Prepared by:	Sonia Owen
Literature reference:	No information available

All chemicals may pose unknown hazards and should be used with caution. This Material Safety Data Sheet (MSDS) applies only to the material as packaged. If this product is combined with other materials, deteriorates, or becomes contaminated, it may pose hazards not mentioned in this MSDS. The physical properties reported in this MSDS are obtained from the literature and do not constitute product specifications. Information contained herein does not constitute a warranty, whether expressed or implied, as to the safety, merchantability or fitness of the goods for a particular purpose. Spectrum Chemicals & Laboratory Products, Inc. assumes no responsibility for results obtained or for incidental or consequential damages, including lost profits, arising from the use of these data. No warranty against infringement of any patent, copyright or trademark is made or implied. It shall be the user's responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. While this MSDS is based on technical data judged to be reliable, Spectrum assumes no responsibility for the completeness or accuracy of the information contained herein.