

Safety Data Sheet

OSHA HazCom Standard 29 CFR 1910.1200(g) revised in 2024 and GHS Rev 07.

Date of issue: 08/08/2025

Reviewed on 08/08/2025

* 1 Identification

- **Product identifier**
- **Trade name:** *Tris(2-carboxyethyl)phosphine hydrochloride*
- **CAS Number:**
51805-45-9
- **Other means of identification**
- **Product Description:** *Protein reducing agent*
- **Details of the supplier of the safety data sheet**
- **Manufacturer/Supplier:**
ReSyn Biosciences Pty Ltd
Building 20
CSIR
Meiring Naude Road
Brummeria
Pretoria
South Africa
0184
+2763 358 5538
- **Emergency telephone number:** +2763 358 5538

2 Hazard(s) identification

- **Classification of the substance or mixture**



GHS05 Corrosion

Skin corrosion 1B H314 Causes severe skin burns and eye damage.

- **Label elements**
- **GHS label elements** *The substance is classified and labeled according to the Globally Harmonized System (GHS).*
- **Hazard pictograms**



GHS05

- **Signal word** *Danger*
- **Hazard-determining components of labeling:**
Tris(carboxyethyl)phosphine hydrochloride
- **Hazard statements**
Causes severe skin burns and eye damage.
- **Precautionary statements**
*Do not breathe dusts or mists.
Wash thoroughly after handling.
Wear protective gloves/protective clothing/eye protection/face protection.
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].
If inhaled: Remove person to fresh air and keep comfortable for breathing.
If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
Immediately call a poison center/doctor.
Specific treatment (see on this label).*

(Contd. on page 2)

Safety Data Sheet

OSHA HazCom Standard 29 CFR 1910.1200(g) revised in 2024 and GHS Rev 07.

Date of issue: 08/08/2025

Reviewed on 08/08/2025

Trade name: Tris(2-carboxyethyl)phosphine hydrochloride

(Contd. of page 1)

Wash contaminated clothing before reuse.

Store locked up.

Dispose of contents/container in accordance with local/regional/national/international regulations.

· **Unknown acute toxicity:**

This value refers to knowledge of known, established toxicological or ecotoxicological values.

100 % of the mixture consists of component(s) of unknown toxicity.

· **Information pertaining to particular dangers for man and environment:**

· **Classification system:** NFPA/HMIS Definitions: 0-Least, 1-Slight, 2-Moderate, 3-High, 4-Extreme

· **NFPA ratings (scale 0 - 4)**



· **HMIS-ratings (scale 0 - 4)**



· **Other hazards**

· **Results of PBT and vPvB assessment**

· **PBT:** Not applicable.

· **vPvB:** Not applicable.

· **Classification according to (d)(1)(ii) of § 1910.1200**

The SDS issuer does not object to the classifications provided by importers or manufacturers of precursor products.

· **Hazards not otherwise classified (HNOC)**

There are no adverse physical or health effects known that are not covered by the hazard classes of the Hazard Communications Standard.

3 Composition/information on ingredients

· **Chemical characterization: Substances**

· **CAS No. Description**

51805-45-9 Tris(carboxyethyl)phosphine hydrochloride

* 4 First-aid measures

· **Description of first aid measures**

· **General information:** Immediately remove any clothing soiled by the product.

· **After inhalation:** In case of unconsciousness place patient stably in side position for transportation.

· **After skin contact:**

Immediate medical treatment necessary. Failure to treat burns can prevent wounds from healing.

Immediately rinse with water.

Remove contaminated clothing and wash before reuse.

· **After eye contact:**

Rinse opened eye for several minutes under running water. Then consult a doctor.

If easy to do so, remove contact lenses if worn.

If eye irritation occurs, consult a doctor.

· **After swallowing:** Drink copious amounts of water and provide fresh air. Immediately call a doctor.

· **Most important symptoms and effects, both acute and delayed** No further relevant information available.

· **Indication of any immediate medical attention and special treatment needed** Treat symptomatically.

(Contd. on page 3)

Safety Data Sheet

OSHA HazCom Standard 29 CFR 1910.1200(g) revised in 2024 and GHS Rev 07.

Date of issue: 08/08/2025

Reviewed on 08/08/2025

Trade name: **Tris(2-carboxyethyl)phosphine hydrochloride**

(Contd. of page 2)

* 5 Fire-fighting measures

· **Extinguishing media**

· **Suitable extinguishing agents:**

Use fire fighting measures that suit the environment.

CO₂, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.

· **For safety reasons unsuitable extinguishing agents:** No further relevant information.

· **Special hazards arising from the substance or mixture**

During heating or in case of fire poisonous gases are produced.

Development of hazardous combustion gases or vapours possible in the event of fire.

Carbon oxides

Oxides of phosphorus

Hydrogen chloride gas

· **Advice for firefighters**

· **Protective equipment:**

As in any fire, wear self-contained breathing apparatus pressure-demand (NIOSH approved or equivalent) and full protective gear to prevent contact with skin and eyes.

6 Accidental release measures

· **Personal precautions, protective equipment and emergency procedures**

Mount respiratory protective device.

Wear protective equipment. Keep unprotected persons away.

· **Environmental precautions:** Do not allow to enter sewers / surface or ground water.

· **Methods and material for containment and cleaning up:**

Use neutralizing agent.

Dispose contaminated material as waste according to section 13.

Ensure adequate ventilation.

· **Protective Action Criteria for Chemicals**

Protective Action Criteria (PACs) are essential components for planning and response to uncontrolled releases of hazardous chemicals.

· **PAC-1:**

PAC 1: Mild, transient health effects.

Substance is not listed.

· **PAC-2:**

PAC 2: Irreversible or other serious health effects that could impair the ability to take protective action.

Substance is not listed.

· **PAC-3:**

PAC 3: Life-threatening health effects.

Substance is not listed.

· **Reference to other sections**

See Section 7 for information on safe handling.

See Section 8 for information on personal protection equipment.

See Section 13 for disposal information.

* 7 Handling and storage

· **Precautions for safe handling**

Thorough dedusting.

Ensure good ventilation/exhaustion at the workplace.

· **Information about protection against explosions and fires:** Keep respiratory protective device available.

(Contd. on page 4)

Safety Data Sheet

OSHA HazCom Standard 29 CFR 1910.1200(g) revised in 2024 and GHS Rev 07.

Date of issue: 08/08/2025

Reviewed on 08/08/2025

Trade name: **Tris(2-carboxyethyl)phosphine hydrochloride**

(Contd. of page 3)

- **Conditions for safe storage, including any incompatibilities**
- **Storage:**
- **Requirements to be met by storerooms and receptacles:** No special requirements.
- **Information about storage in one common storage facility:** Recommended storage temperature 2 - 8°C
- **Further information about storage conditions:** Keep receptacle tightly sealed.
- **Storage class:** Storage class (TRGS 510): 8A: Combustible, corrosive hazardous materials
- **Specific end use(s)** No further relevant information available.

* 8 Exposure controls/personal protection

- **Control parameters**
- **Components with limit values that require monitoring at the workplace:** Not required.
- **Additional information:** The lists that were valid during the creation of this SDS were used as basis.
- **Exposure controls**
Ventilation must be adequate to maintain the ambient workplace atmosphere below the exposure limit(s) outlined in the SDS. Where acceptable concentrations cannot be maintained by general mechanical ventilation, local exhaust ventilation is recommended.
- **Appropriate engineering controls** No further data; see section 7.
- **Personal protective equipment:**
- **General protective and hygienic measures:**
Keep away from foodstuffs, beverages and feed.
Immediately remove all soiled and contaminated clothing.
Wash hands before breaks and at the end of work.
Avoid contact with the eyes and skin.
- **Breathing equipment:**
In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use respiratory protective device that is independent of circulating air.
- **Protection of hands:**



Protective gloves

- **Material of gloves**
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.
- **Penetration time of glove material**
The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.
- **Eye protection:**



Tightly sealed goggles

- **Body protection:**



Lab coat

- **Limitation and supervision of exposure into the environment** None

(Contd. on page 5)



Safety Data Sheet

OSHA HazCom Standard 29 CFR 1910.1200(g) revised in 2024 and GHS Rev 07.

Date of issue: 08/08/2025

Reviewed on 08/08/2025

Trade name: **Tris(2-carboxyethyl)phosphine hydrochloride**

(Contd. of page 4)

* 9 Physical and chemical properties

· Information on basic physical and chemical properties

· General Information

· Physical state

Solid

· Color:

White

· Odor:

Odorless

· Odor threshold:

Not determined.

· Melting point/Melting range:

177 °C (350.6 °F)

· Boiling point/Boiling range:

519 °C (966.2 °F)

· Flammability:

Product is not flammable.

· Explosion limits:

· Lower:

Not determined.

· Upper:

Not determined.

· Flash point:

Not applicable.

· Decomposition temperature:

Not determined.

· pH-value:

Not applicable.

· Viscosity:

· Kinematic:

Not applicable.

· Dynamic:

Not applicable.

· Solubility in / Miscibility with

· Water:

Soluble.

· Partition coefficient (n-octanol/water):

Not determined.

· Vapor pressure:

Not applicable.

· Density at 20 °C (68 °F):

1.041 g/cm³ (8.68714 lbs/gal)

· Relative density

Not determined.

· Vapor density

Not applicable.

· Particle characteristics

Not determined.

· Other information

· Appearance:

· Form:

Powder

· Important information on protection of health and environment, and on safety.

· Ignition temperature:

Not determined.

· Danger of explosion:

Product does not present an explosion hazard.

· VOC content:

0.00 %

· Change in condition

· Oxidizing properties

None

* 10 Stability and reactivity

· Reactivity

The product is stable under normal conditions.

No further relevant information available.

· Chemical stability

Stable under normal conditions.

· Thermal decomposition / conditions to be avoided:

No decomposition if used according to specifications.

· Possibility of hazardous reactions

Reacts with oxidizing agents.

· Conditions to avoid

No further relevant information available.

· Incompatible materials:

No further relevant information available.

· Hazardous decomposition products:

No dangerous decomposition products known.

(Contd. on page 6)

Safety Data Sheet

OSHA HazCom Standard 29 CFR 1910.1200(g) revised in 2024 and GHS Rev 07.

Date of issue: 08/08/2025

Reviewed on 08/08/2025

Trade name: **Tris(2-carboxyethyl)phosphine hydrochloride**

(Contd. of page 5)

11 Toxicological information

· **Information on toxicological effects**

· **Acute toxicity:**

· **LD/LC50 values that are relevant for classification:** No data available.

· **Primary irritant effect:**

· **on the skin:** Caustic effect on skin and mucous membranes.

· **on the eye:** Strong caustic effect.

· **Sensitization:** No sensitizing effects known.

· **Additional toxicological information:**

Swallowing will lead to a strong caustic effect on mouth and throat and to the danger of perforation of esophagus and stomach.

· **Interactive effects** No interactive effects between components are known.

· **Carcinogenic categories**

· **IARC (International Agency for Research on Cancer)** Substance is not listed.

· **NTP (National Toxicology Program)** Substance is not listed.

· **OSHA-Ca (Occupational Safety & Health Administration)** Substance is not listed.

· **Alternative sources for toxicological information** No non-standard sources for toxicological information were used.

12 Ecological information

· **Toxicity**

· **Aquatic toxicity:** No further relevant information available.

· **Persistence and degradability** No further relevant information available.

· **Bioaccumulative potential** No further relevant information available.

· **Mobility in soil** No further relevant information available.

· **Results of PBT and vPvB assessment**

· **PBT:** Not applicable.

· **vPvB:** Not applicable.

· **Other adverse effects**

· **Additional ecological information:**

· **General notes:**

Water hazard class 1 (Self-assessment): slightly hazardous for water

Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.

Must not reach bodies of water or drainage ditch undiluted or unneutralized.

13 Disposal considerations

· **Waste treatment methods**

· **Recommendation:**

Must not be disposed of together with household garbage. Do not allow product to reach sewage system.

Observe all federal, state and local environmental regulations when disposing of this material.

· **Uncleaned packagings:**

· **Recommendation:** Disposal must be made according to official regulations.

· **Recommended cleansing agent:** Water, if necessary with cleansing agents.

14 Transport information

· **UN-Number**

· **DOT, IMDG, IATA**

UN3261

(Contd. on page 7)

Safety Data Sheet

OSHA HazCom Standard 29 CFR 1910.1200(g) revised in 2024 and GHS Rev 07.

Date of issue: 08/08/2025

Reviewed on 08/08/2025

Trade name: Tris(2-carboxyethyl)phosphine hydrochloride

(Contd. of page 6)

· **UN proper shipping name**

· **DOT, IATA**

Corrosive solid, acidic, organic, n.o.s. (Tris(carboxyethyl)phosphine hydrochloride)

· **IMDG**

CORROSIVE SOLID, ACIDIC, ORGANIC, N.O.S. (Tris(carboxyethyl)phosphine hydrochloride)

· **Transport hazard class(es)**

· **DOT**



· **Class**

8 Corrosive substances

· **Label**

8

· **IMDG, IATA**



· **Class**

8 Corrosive substances

· **Label**

8

· **Packing group**

· **DOT, IMDG, IATA**

II

· **Environmental hazards:**

Not applicable.

· **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**

Not applicable.

· **Transport/Additional information:**

· **DOT**

· **Quantity limitations**

On passenger aircraft/rail: 15 kg

On cargo aircraft only: 50 kg

· **IMDG**

· **Limited quantities (LQ)**

1 kg

· **Excepted quantities (EQ)**

Code: E2

Maximum net quantity per inner packaging: 30 g

Maximum net quantity per outer packaging: 500 g

Warning: Corrosive substances

· **Special precautions for user**

· **Hazard identification number (Kemler code):** 80

· **EMS Number:**

F-A,S-B

· **Segregation groups**

(SGG1) Acids

· **Stowage Category**

B

· **Segregation Code**

SG36 Stow "separated from" SGG18-alkalis.

SG49 Stow "separated from" SGG6-cyanides

· **UN "Model Regulation":**

UN 3261 CORROSIVE SOLID, ACIDIC, ORGANIC, N.O.S. (TRIS(CARBOXYETHYL)PHOSPHINE HYDROCHLORIDE), 8, II

15 Regulatory information

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

No further relevant information available.

· **Sara**

· **Section 355 (extremely hazardous substances):** Substance is not listed.

(Contd. on page 8)

Safety Data Sheet

OSHA HazCom Standard 29 CFR 1910.1200(g) revised in 2024 and GHS Rev 07.

Date of issue: 08/08/2025

Reviewed on 08/08/2025

Trade name: Tris(2-carboxyethyl)phosphine hydrochloride

(Contd. of page 7)

- **Section 313 (Specific toxic chemical listings):** Substance is not listed.
- **TSCA (Toxic Substances Control Act):** Substance is not listed.
- **Hazardous Air Pollutants** Substance is not listed.
- **Proposition 65**
- **Chemicals known to cause cancer:** Substance is not listed.
- **Chemicals known to cause reproductive toxicity for females:** Substance is not listed.
- **Chemicals known to cause reproductive toxicity for males:** Substance is not listed.
- **Chemicals known to cause developmental toxicity:** Substance is not listed.
- **New Jersey Right-to-Know List:** Substance is not listed.
- **New Jersey Special Hazardous Substance List:** Substance is not listed.
- **Pennsylvania Right-to-Know List:** Substance is not listed.
- **Pennsylvania Special Hazardous Substance List:** Substance is not listed.
- **Carcinogenic categories**
- **EPA (Environmental Protection Agency)** Substance is not listed.
- **TLV (Threshold Limit Value)** Substance is not listed.
- **NIOSH-Ca (National Institute for Occupational Safety and Health)** Substance is not listed.
- **GHS label elements** The substance is classified and labeled according to the Globally Harmonized System (GHS).
- **Hazard pictograms**



GHS05

- **Signal word** Danger
- **Hazard-determining components of labeling:**
Tris(carboxyethyl)phosphine hydrochloride
- **Hazard statements**
Causes severe skin burns and eye damage.
- **Precautionary statements**
Do not breathe dusts or mists.
Wash thoroughly after handling.
Wear protective gloves/protective clothing/eye protection/face protection.
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].
If inhaled: Remove person to fresh air and keep comfortable for breathing.
If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
Immediately call a poison center/doctor.
Specific treatment (see on this label).
Wash contaminated clothing before reuse.
Store locked up.
Dispose of contents/container in accordance with local/regional/national/international regulations.
- **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

16 Other information

The information and recommendations in this safety data sheet are, to the best of our knowledge, accurate as of the date of issue. Nothing herein shall be deemed to create warranty, expressed or implied, and shall not establish a legally valid contractual relationship. It is the responsibility of the user to determine applicability of this information and the suitability of the material or product for any particular purpose.

- **SDS created by:** Access GHS, LLC - 888-363-4870 - Team@access-ghs-sds.com

(Contd. on page 9)

Safety Data Sheet

OSHA HazCom Standard 29 CFR 1910.1200(g) revised in 2024 and GHS Rev 07.

Date of issue: 08/08/2025

Reviewed on 08/08/2025

Trade name: *Tris(2-carboxyethyl)phosphine hydrochloride*

(Contd. of page 8)

- **Date of previous version** 08/05/2025
- **Date of preparation** 08/08/2025
- **Abbreviations and acronyms:**
 - IMDG: International Maritime Code for Dangerous Goods
 - DOT: US Department of Transportation
 - IATA: International Air Transport Association
 - CAS: Chemical Abstracts Service (division of the American Chemical Society)
 - NFPA: National Fire Protection Association (USA)
 - HMIS: Hazardous Materials Identification System (USA)
 - VOC: Volatile Organic Compounds (USA, EU)
 - LC50: Lethal concentration, 50 percent
 - LD50: Lethal dose, 50 percent
 - PBT: Persistent, Bioaccumulative and Toxic
 - vPvB: very Persistent and very Bioaccumulative
 - NIOSH: National Institute for Occupational Safety and Health
 - OSHA: Occupational Safety & Health
 - TLV: Threshold Limit Value
 - PEL: Permissible Exposure Limit
 - REL: Recommended Exposure Limit
 - Skin corrosion 1B: Skin corrosion/irritation – Category 1B
- *** Data compared to the previous version altered.**