SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifiers

   Product name: Trizma® hydrochloride

   Product Number: T5941

   Brand: Sigma

   CAS-No.: 1185-53-1

1.2 Relevant identified uses of the substance or mixture and uses advised against

   Identified uses: Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

   Company: Sigma-Aldrich Inc.
   3050 SPRUCE ST
   ST. LOUIS MO 63103
   UNITED STATES

   Telephone: +1 314 771-5765
   Fax: +1 800 325-5052

1.4 Emergency telephone

   Emergency Phone #: 800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

   Not a hazardous substance or mixture.

2.2 GHS Label elements, including precautionary statements

   Not a hazardous substance or mixture.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

SECTION 3: Composition/information on ingredients

3.1 Substances

   Synonyms: TRIS hydrochloride
               TRIS HCl
               Tris(hydroxymethyl)aminomethanehydrochloride

Sigma - T5941
The life science business of Merck KGaA, Darmstadt, Germany operates as MilliporeSigma in the US and Canada.

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**Formula**: \( \text{C}_4\text{H}_{11}\text{NO}_3 \cdot \text{HCl} \)  
**Molecular weight**: 157.60 g/mol  
**CAS-No.**: 1185-53-1  
**EC-No.**: 214-684-5

No components need to be disclosed according to the applicable regulations.

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**SECTION 4: First aid measures**

4.1 **Description of first-aid measures**

- **If inhaled**  
  After inhalation: fresh air.

- **In case of skin contact**  
  In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/shower.

- **In case of eye contact**  
  After eye contact: rinse out with plenty of water. Remove contact lenses.

- **If swallowed**  
  After swallowing: make victim drink water (two glasses at most). Consult doctor if feeling unwell.

4.2 **Most important symptoms and effects, both acute and delayed**  
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11.

4.3 **Indication of any immediate medical attention and special treatment needed**  
No data available

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**SECTION 5: Firefighting measures**

5.1 **Extinguishing media**

- **Suitable extinguishing media**  
  Water, Foam, Carbon dioxide (CO2), Dry powder

- **Unsuitable extinguishing media**  
  For this substance/mixture no limitations of extinguishing agents are given.

5.2 **Special hazards arising from the substance or mixture**  
Carbon oxides  
Nitrogen oxides (NOx)  
Hydrogen chloride gas  
Combustible.  
Development of hazardous combustion gases or vapours possible in the event of fire.

5.3 **Advice for firefighters**  
In the event of fire, wear self-contained breathing apparatus.

5.4 **Further information**  
Suppress (knock down) gases/vapors/mists with a water spray jet. Prevent fire extinguishing water from contaminating surface water or the ground water system.
SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
Advice for non-emergency personnel: Avoid inhalation of dusts. Evacuate the danger area, observe emergency procedures, consult an expert.
For personal protection see section 8.

6.2 Environmental precautions
Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up
Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up dry. Dispose of properly. Clean up affected area. Avoid generation of dusts.

6.4 Reference to other sections
For disposal see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

- **Storage conditions**
  - Tightly closed. Dry.
  - Hygroscopic.
  - Storage class (TRGS 510): 11: Combustible Solids

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

- **Ingredients with workplace control parameters**
  Contains no substances with occupational exposure limit values.

8.2 Exposure controls

- **Appropriate engineering controls**
  Change contaminated clothing. Wash hands after working with substance.

- **Personal protective equipment**
  
  **Eye/face protection**
  Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU). Safety glasses

  **Skin protection**
  This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN374 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).
Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested: KCL 741 Dermatril® L

This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN374 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested: KCL 741 Dermatril® L

**Respiratory protection**
required when dusts are generated.
Our recommendations on filtering respiratory protection are based on the following standards: DIN EN 143, DIN 14387 and other accompanying standards relating to the used respiratory protection system.

**Control of environmental exposure**
Do not let product enter drains.

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**SECTION 9: Physical and chemical properties**

**9.1 Information on basic physical and chemical properties**

a) **Appearance**
   - Form: crystalline
   - Color: white

b) **Odor**
   - odorless

c) **Odor Threshold**
   - Not applicable

d) **pH**
   - 4.2 at 100 g/l at 20 °C (68 °F)

e) **Melting point/freezing point**
   - Melting point: ca.150.7 °C (ca.303.3 °F) at ca.1,013 hPa - OECD Test Guideline 102

f) **Initial boiling point and boiling range**
   - 225 - 295 °C 437 - 563 °F at ca.1,013 hPa - OECD Test Guideline 103 - Decomposition

g) **Flash point**
   - Not applicable

h) **Evaporation rate**
   - No data available

i) **Flammability (solid, gas)**
   - No data available

j) **Upper/lower flammability or explosive limits**
   - No data available

k) **Vapor pressure**
   - < 0.1 hPa at 50 °C (122 °F) - OECD Test Guideline 104

l) **Vapor density**
   - No data available

m) **Relative density**
   - No data available
n) Water solubility ca.561 g/l at 20 °C (68 °F) - OECD Test Guideline 105 - soluble

o) Partition coefficient: log Pow: ca.-3.6 at 20 °C (68 °F) - OECD Test Guideline 107 - Bioaccumulation is not expected.

p) Autoignition temperature No data available

q) Decomposition temperature ca.230 °C (ca.446 °F) -

r) Viscosity No data available

s) Explosive properties No data available

t) Oxidizing properties No data available

9.2 Other safety information
Surface tension ca.61.4 mN/m at 1.001g/l at 20 °C (68 °F) - OECD Test Guideline 115

SECTION 10: Stability and reactivity

10.1 Reactivity
Risk of dust explosion.
The following applies in general to flammable organic substances and mixtures: in correspondingly fine distribution, when whirled up a dust explosion potential may generally be assumed.

10.2 Chemical stability
hygroscopic
The product is chemically stable under standard ambient conditions (room temperature).

10.3 Possibility of hazardous reactions
Violent reactions possible with:
Strong oxidizing agents

10.4 Conditions to avoid
Exposure to moisture.
no information available

10.5 Incompatible materials
No data available

10.6 Hazardous decomposition products
In the event of fire: see section 5

SECTION 11: Toxicological information

11.1 Information on toxicological effects
Acute toxicity
LD50 Oral - Rat - female - > 5,000 mg/kg
(OECD Test Guideline 425)
Inhalation: No data available
LD50 Dermal - Rat - male and female - > 5,000 mg/kg  
(OECD Test Guideline 402)

**Skin corrosion/irritation**  
Skin - reconstructed human epidermis (RhE)  
Result: No skin irritation  
(OECD Test Guideline 439)

**Serious eye damage/eye irritation**  
Eyes - Bovine cornea  
Result: No eye irritation - 4 h  
(OECD Test Guideline 437)

**Respiratory or skin sensitization**  
Maximization Test - Guinea pig  
Result: negative  
(OECD Test Guideline 406)

**Germ cell mutagenicity**  
Test Type: Chromosome aberration test in vitro  
Test system: Chinese hamster lung cells  
Metabolic activation: with and without metabolic activation  
Method: OECD Test Guideline 473  
Result: negative  
Test Type: Ames test  
Test system: Escherichia coli/Salmonella typhimurium  
Metabolic activation: with and without metabolic activation  
Method: OECD Test Guideline 471  
Result: negative  
Test Type: In vitro mammalian cell gene mutation test  
Test system: Chinese hamster ovary cells  
Metabolic activation: with and without metabolic activation  
Method: OECD Test Guideline 476  
Result: negative

**Carcinogenicity**  
IARC: No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.  
NTP: No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.  
OSHA: No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

**Reproductive toxicity**  
No data available

**Specific target organ toxicity - single exposure**  
No data available

**Specific target organ toxicity - repeated exposure**  
No data available

**Aspiration hazard**  
No data available

**11.2 Additional Information**  
Repeated dose toxicity - Rat - male and female - Oral - NOAEL (No observed adverse effect level) - > 1,000 mg/kg
irritant effects
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

SECTION 12: Ecological information

12.1 Toxicity

Toxicity to fish static test LC50 - Leuciscus idus (Golden orfe) - 460 mg/l - 96 h (OECD Test Guideline 203)
Remarks: (in analogy to similar products)
The value is given in analogy to the following substances: Tris(hydroxymethyl)aminomethane

Toxicity to daphnia and other aquatic invertebrates static test EC50 - Daphnia magna (Water flea) - > 117 mg/l - 48 h (OECD Test Guideline 202)

Toxicity to bacteria static test EC50 - activated sludge - > 1,000 mg/l - 3 h (OECD Test Guideline 209)

12.2 Persistence and degradability

Biodegradability aerobic - Exposure time 28 d
Result: 97.1 % - Readily biodegradable.
(OECD Test Guideline 301F)

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects
No data available

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product
Waste material must be disposed of in accordance with the national and local regulations. Leave chemicals in original containers. No mixing with other waste. Handle uncleaned containers like the product itself. See www.retrologistik.com for processes regarding the return of chemicals and containers, or contact us there if you have further questions.

SECTION 14: Transport information

DOT (US)
SECTION 15: Regulatory information

**SARA 302 Components**
This material does not contain any components with a section 302 EHS TPQ.

**SARA 313 Components**
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

**SARA 311/312 Hazards**
No SARA Hazards

**Massachusetts Right To Know Components**
No components are subject to the Massachusetts Right to Know Act.

SECTION 16: Other information

**Further information**
The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

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