Date of Issue:
19 February 2019

# SAFETY DATA SHEET

## 1. SUBSTANCE AND SOURCE IDENTIFICATION

**Product Identifier**

**SRM Number:** 723e
**SRM Name:** Tris(hydroxymethyl)aminomethane $(HOCH_2)_3CNH_2$ Acidimetric Standard
**Other Means of Identification:** Not applicable.

**Recommended Use of This Material and Restrictions of Use**

This Standard Reference Material (SRM) consists of highly purified tris(hydroxymethyl)aminomethane $(HOCH_2)_3CNH_2$ [2-amino-2-(hydroxymethyl)-1,3-propanediol; "Tris"; "THAM"], hereafter referred to as Tris. SRM 723e is intended primarily for use in acidimetric standardization. A unit of SRM 723e consists of 50 g in a clear glass bottle.

**Company Information**

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## 2. HAZARDS IDENTIFICATION

**Classification**

| | | |
|---|---|---|
| **Physical Hazard:** | Not classified. | |
| **Health Hazard:** | Skin Corrosion/Irritation | Category 2 |
| | Serious Eye damage/Eye irritation | Category 2A |
| | STOT - Single Exposure | Category 3 |

**Label Elements**
**Symbol**

**Signal Word**
Warning

**Hazard Statement(s):**

| | |
|---|---|
| H315 | Causes skin irritation. |
| H319 | Causes serious eye irritation. |
| H335 | May cause respiratory irritation. |

**Precautionary Statement(s):**

| | |
|---|---|
| P261 | Avoid breathing dust. |
| P264 | Wash hands thoroughly after handling. |
| P271 | Use only outdoors or in a well-ventilated area. |
| P280 | Wear protective gloves. |
| P302+P352 | If on skin: Wash with plenty of water. |
| P304+P340 | If inhaled: Remove person to fresh air and keep comfortable for breathing. |
| P305+P351+P338 | If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. |
| P322+P364 | Take off contaminated clothing and wash it before reuse. |

| | |
|---|---|
| P332+P337+P313 | If skin or eye irritation occurs: Get medical attention. |
| P403+P233 | Store in a well-ventilated place. Keep container tightly closed. |
| P405 | Store locked up. |
| P501 | Dispose of contents and containers in accordance with all applicable regulations. |

**Hazards Not Otherwise Classified:** Not applicable.

**Ingredients(s) with Unknown Acute Toxicity:** Not applicable.

## 3. Composition and Information on Hazardous Ingredients

**Substance:** Tris(hydroxymethyl)aminomethane

**Other Designations:** Tris [tris buffering agent; trishydroxymentylaminomethane; tris(methylolamino)methane; 1,1,1 tris(hydroxymethyl)methanamine; tris(hydroxymethyl)methylamine; tris(hydroxymethyl)methanamine]

Components are listed in compliance with OSHA's 29 CFR 1910.1200; for the actual values see the Certificate of Analysis.

| Hazardous Component(s) | CAS Number | EC Number (EINECS) | Nominal Mass Concentration (%) |
|---|---|---|---|
| Tris(hydroxymethyl)aminomethane | 77-86-1 | 201-064-4 | 100 |

## 4. First Aid Measures

**Description of First Aid Measures:**

**Inhalation:** If adverse effects occur, remove to uncontaminated area. If not breathing, give artificial respiration or oxygen by qualified personnel. Seek immediate medical attention.

**Skin Contact:** Wash skin with soap and water for at least 15 minutes. Thoroughly clean and dry contaminated clothing before reuse.

**Eye Contact:** Flush eyes with water for at least 15 minutes. If necessary, seek medical attention.

**Ingestion:** If a large amount is swallowed, get medical attention.

**Most Important Symptoms/Effects, Acute and Delayed:** Skin, eye, and possible respiratory irritation.

**Indication of any immediate medical attention and special treatment needed, if necessary:** If any of the above symptoms are present, seek medical attention if needed.

## 5. Fire Fighting Measures

**Fire and Explosion Hazards:** Negligible fire hazard. See Section 9, "Physical and Chemical Properties" for flammability properties.

**Extinguishing Media:**
Suitable: Regular dry chemical, dry sand, water, and regular foam.
Unsuitable: None listed.

**Specific Hazards Arising from the Chemical:** None listed.

**Special Protective Equipment and Precautions for Fire-Fighters:** Avoid inhalation of material or combustion byproducts. Wear full protective clothing and NIOSH approved self-contained breathing apparatus (SCBA).

**NFPA Ratings** (0 = Minimal; 1 = Slight; 2 = Moderate; 3 = Serious; 4 = Severe)

Health = 2 Fire = 0 Reactivity = 0

## 6. Accidental Release Measures

**Personal Precautions, Protective Equipment and Emergency Procedures:** Use suitable protective equipment; see Section 8, "Exposure Controls and Personal Protection".

**Methods and Materials for Containment and Clean up:** Keep out of water supplies and sewers. Do not touch spilled material. Notify safety personnel of spills. Collect spilled material in appropriate container for disposal. Isolate hazard area and deny entry.

## 7. HANDLING AND STORAGE

**Safe Handling Precautions:** Minimize dust generation. See Section 8, "Exposure Controls and Personal Protection".

**Storage:** Store and handling in accordance with all current regulations and standards. Keep separated from incompatible substances (acids, bases, metals, oxidizing materials).

## 8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

**Exposure Limits:** No occupational exposure limits have been established. The exposure limits for Particulates Not Otherwise Regulated are applicable.

OSHA (PEL): 15 $mg/m^3$ (TWA, total particulates)
5 $mg/m^3$ (TWA, respirable particulates)

**Engineering Controls:** Provide local exhaust or process enclosure ventilation system. Ensure compliance with applicable exposure limits.

**Personal Protection:** In accordance with OSHA 29 CFR 1910.132, subpart I, wear appropriate Personal Protective Equipment (PPE) to minimize exposure to this material.

**Respiratory Protection:** If workplace conditions warrant a respirator, a respiratory protection program that meets OSHA 29CFR 1910.134 must be followed. Refer to NIOSH 42 CFR 84 for applicable certified respirators.

**Eye/Face Protection:** Wear splash resistant safety goggles with a face shield. An eye wash station should be readily available near areas of use.

**Skin and Body Protection:** Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. Chemical-resistant gloves should be worn at all times when handling chemicals.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

| | |
|---|---|
| **Descriptive Properties:** | |
| **Appearance (physical state, color, etc.):** | white crystalline, hygroscopic powder |
| **Molecular Formula:** | $C_4H_{11}NO_3$ |
| **Molar Mass (g/mol):** | 121.1 |
| **Odor:** | odorless |
| **Odor threshold:** | not available |
| **pH (solution):** | 10.4 at 1.2 % |
| **Evaporation rate:** | not applicable |
| **Melting point/freezing point (ºC):** | 171–172 (340–342 ºF) |
| **Relative Density (g/L):** | not available |
| **Vapor Pressure (mmHg):** | not applicable |
| **Vapor Density (air = 1):** | not applicable |
| **Viscosity (cP):** | not applicable |
| **Solubility(ies):** | water soluble (55 %); moderately soluble: methanol, ethanol, ethylene glycol, dimethylformamide; slightly soluble: acetone, ether; very slightly soluble: ethyl acetate, cyclohexane, chloroform, carbon tetrachloride |
| **Partition coefficient (n-octanol/water):** | log Kow = –1.56 |
| **Particle Size (if relevant)** | not available |
| **Thermal Stability Properties:** | |
| **Autoignition Temperature (ºC):** | not available |
| **Thermal Decomposition (ºC):** | not available |
| **Initial boiling point and boiling range (ºC):** | 219–220 (426–428 ºF) at 10 mmHg |
| **Explosive Limits, LEL (Volume %):** | not available |
| **Explosive Limits, UEL (Volume %):** | not available |
| **Flash Point (ºC)** | not available |
| **Flammability (solid, gas):** | not available |

## 10. STABILITY AND REACTIVITY

**Reactivity:** Stable at normal temperatures and pressure.

**Stability:** X Stable _____ Unstable

**Possible Hazardous Reactions:** None listed.

**Conditions to Avoid:** Avoid generating dust and exposure to moisture.

**Incompatible Materials:** Acids, bases, metals, and oxidizing materials.

**Fire/Explosion Information:** See Section 5, "Fire Fighting Measures".

**Hazardous Decomposition:** Thermal decomposition will produce oxides of nitrogen and carbon.

**Hazardous Polymerization:** _____ Will Occur X Will Not Occur

## 11. TOXICOLOGICAL INFORMATION

**Route of Exposure:** X Inhalation _____ Skin _____ Ingestion

**Symptoms Related to the Physical, Chemical and Toxicological Characteristics:** Skin, eye, and possible respiratory irritation.

**Potential Health Effects (Acute, Chronic and Delayed):**

**Inhalation:** Inhalation may cause irritation of the mucous membranes with tightness and pain in the chest, coughing, and difficulty breathing.

**Skin Contact:** Skin exposure may result in irritation with redness, pain, and possibly sensitization. Dermatitis may develop due to irritation or sensitization over time.

**Eye Contact:** Eye irritation with redness, pain, and possibly corneal damage may occur. Prolonged or repeated exposure may result in conjunctivitis.

**Ingestion:** Ingestion of this material is unlikely under normal conditions of use. If ingested, gastrointestinal irritation and possible burns to the mouth and stomach may result. A large does to laboratory animals caused weakness, collapse, and death.

**Numerical Measures of Toxicity:**

**Acute Toxicity:** Not classified.
Rat, Oral LD50: >3000 mg/kg

**Skin Corrosion/Irritation:** Category 2
Rabbit, Dermal: 25 % moderate; 500 mg severe
Woman, Dermal: 1 % moderate

**Serious Eye damage/Eye irritation:** Category 2A, No data available on effects on the eyes, deemed to be a Category 2A based on skin irritation data.

**Respiratory Sensitization:** Not classified; no data available.

**Skin Sensitization:** Not classified; no data available.

**Germ Cell Mutagenicity:** Not classified; no data available.

**Carcinogenicity:** Not classified.

**Listed as a Carcinogen/Potential Carcinogen** _____ Yes X No
Tris(Hydroxymethyl)Aminomethane is not listed by IARC, NTP or OSHA as a carcinogen.

**Reproductive Toxicity:** Not classified.
Rat, Oral TDLo: 12 000 mg/kg (prior to copulation 14 d, 4 d, continuous)

**Specific Target Organ Toxicity, Single Exposure:** Not classified; no data available.

**Specific Target Organ Toxicity, Repeated Exposure:** Category 3; May cause respiratory irritation of the mucous membranes with tightness and pain in the chest, coughing, and difficulty breathing.

**Aspiration Hazard:** Not classified; no data available.

## 12. ECOLOGICAL INFORMATION

**Ecotoxicity Data:** No data available.

**Persistence and Degradability:** Biodegradation may be slow in the environment.

**Bioaccumulative Potential:** Potential for bioconcentration in aquatic organisms is low (estimated BCF equals 3).

**Mobility in Soil:** Very high mobility in soil.

**Other Adverse effects:** No data available.

## 13. DISPOSAL CONSIDERATIONS

**Waste Disposal:** Dispose of waste in accordance with all applicable federal, state, and local regulations.

## 14. TRANSPORTATION INFORMATION

**U.S. DOT and IATA:** Not regulated by DOT or IATA.

## 15. REGULATORY INFORMATION

**U.S. Regulations:**

CERCLA Sections 102a/103 (40 CFR 302.4): Not regulated.

SARA Title III Section 302 (40 CFR 355.30): Not regulated.

SARA Title III Section 304 (40 CFR 355.40): Not regulated.

SARA Title III Section 313 (40 CFR 372.65): Not regulated.

OSHA Process Safety (29 CFR 1910.119): Not regulated.

SARA Title III Sections 311/312 Hazardous Categories (40 CFR 370.21):

| | |
|---|---|
| ACUTE HEALTH: | Yes. |
| CHRONIC HEALTH: | No. |
| FIRE: | No. |
| REACTIVE: | No. |
| PRESSURE: | No. |

**State Regulations:**

California Proposition 65: Not listed.

**U.S. TSCA Inventory:** Listed.

**TSCA 12(b), Export Notification:** Not listed.

**Canadian Regulations:** WHMIS Information: Not provided for this material.

## 16. OTHER INFORMATION

**Issue Date:** 19 February 2019

**Sources:** ChemAdvisor, Inc., SDS *Tris(Hydroxymethyl)Aminomethane*, 09 December 2015.

Hazardous Substances Data Bank, National Library of Medicine, *Tromethamine* CAS# 77-86-1, Full Record, available at https://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?HSDB (accessed Feb 2019).

Center for Disease Control (CDC), NIOSH Pocket Guide to Chemical Hazards, *Particulates Not Otherwise Regulated*, available at https://www.cdc.gov/niosh/npg/npgd0480.html (accessed Feb 2019).

Sigma-Aldrich, Vendor MSDS *Trizma® base*, 07 November 2017.

**Key of Acronyms:**

| | | | |
|---|---|---|---|
| ACGIH | American Conference of Governmental Industrial Hygienists | NIOSH | National Institute for Occupational Safety and Health |
| ALI | Annual Limit on Intake | NIST | National Institute of Standards and Technology |
| CAS | Chemical Abstracts Service | NRC | Nuclear Regulatory Commission |
| CEN | European Committee for Standardization | NTP | National Toxicology Program |
| CERCLA | Comprehensive Environmental Response, Compensation, and Liability Act | OSHA | Occupational Safety and Health Administration |
| CFR | Code of Federal Regulations | PEL | Permissible Exposure Limit |
| CPSU | Coal Mine Dust Personal Sample Unit | RCRA | Resource Conservation and Recovery Act |
| DOT | Department of Transportation | REL | Recommended Exposure Limit |
| EC50 | Effective Concentration, 50 % | RM | Reference Material |
| EINECS | European Inventory of Existing Commercial Chemical Substances | RQ | Reportable Quantity |
| EPCRA | Emergency Planning and Community Right-to-Know Act | RTECS | Registry of Toxic Effects of Chemical Substances |
| IARC | International Agency for Research on Cancer | SARA | Superfund Amendments and Reauthorization Act |
| IATA | International Air Transport Association | SCBA | Self-Contained Breathing Apparatus |
| IDLH | Immediately Dangerous to Life and Health | SRM | Standard Reference Material |
| ISO | International Organization for Standardization | STEL | Short Term Exposure Limit |
| LC50 | Lethal Concentration, 50 % | TDLo | Toxic Dose Low |
| LD50 | Lethal Dose, 50 % | TLV | Threshold Limit Value |
| LEL | Lower Explosive Limit | TPQ | Threshold Planning Quantity |
| MSDS | Material Safety Data Sheet | TSCA | Toxic Substances Control Act |
| NFPA | National Fire Protection Association | TWA | Time Weighted Average |
| MSHA | Mine Safety and Health Administration | UEL | Upper Explosive Limit |
| | | WHMIS | Workplace Hazardous Materials Information System |

**Disclaimer:** Physical and chemical data contained in this SDS are provided only for use in assessing the hazardous nature of the material. The SDS was prepared carefully, using current references; however, NIST does not certify the data in the SDS. The certified values for this material are given in the NIST Certificate of Analysis.

Users of this SRM should ensure that the SDS in their possession is current. This can be accomplished by contacting the SRM Program: telephone (301) 975-2200; fax (301) 948-3730; e-mail srmmsds@nist.gov; or via the Internet at https://www.nist.gov/srm.