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.