

# Tris hydrochloride solution, pH 7.6

sc-301951



The Power to Question

Material Safety Data Sheet

Hazard Alert Code Key: **EXTREME** **HIGH** **MODERATE** **LOW**

## Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

### PRODUCT NAME

Tris hydrochloride solution, pH 7.6

### STATEMENT OF HAZARDOUS NATURE

CONSIDERED A HAZARDOUS SUBSTANCE ACCORDING TO OSHA 29 CFR 1910.1200.

### NFPA



### SUPPLIER

Santa Cruz Biotechnology, Inc.  
2145 Delaware Avenue  
Santa Cruz, California 95060  
800.457.3801 or 831.457.3800

### EMERGENCY:

ChemWatch  
Within the US & Canada: 877-715-9305  
Outside the US & Canada: +800 2436 2255  
(1-800-CHEMCALL) or call +613 9573 3112

### SYNONYMS

"Tris-HCl, 1M Stock Solutions, pH 7.2, Biotechnology performance certified."

## Section 2 - HAZARDS IDENTIFICATION

### CHEMWATCH HAZARD RATINGS

	Min	Max
Flammability:	0	■
Toxicity:	2	■
Body Contact:	2	■
Reactivity:	0	■
Chronic:	2	■

Min/Nil=0  
Low=1  
Moderate=2  
High=3  
Extreme=4



### CANADIAN WHMIS SYMBOLS



## EMERGENCY OVERVIEW

### RISK

Irritating to eyes, respiratory system and skin.

### POTENTIAL HEALTH EFFECTS

#### ACUTE HEALTH EFFECTS

#### SWALLOWED

■ Accidental ingestion of the material may be damaging to the health of the individual.

#### EYE

■ This material can cause eye irritation and damage in some persons.

#### SKIN

■ This material can cause inflammation of the skin on contact in some persons.

■ The material may accentuate any pre-existing dermatitis condition.

■ Skin contact with the material may damage the health of the individual; systemic effects may result following absorption.

■ Open cuts, abraded or irritated skin should not be exposed to this material.

■ Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects.

Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.

#### INHALED

■ The material can cause respiratory irritation in some persons.

The body's response to such irritation can cause further lung damage.

■ Inhalation of vapors or aerosols (mists, fumes), generated by the material during the course of normal handling, may be damaging to the health of the individual.

#### CHRONIC HEALTH EFFECTS

■ Long-term exposure to respiratory irritants may result in disease of the airways involving difficult breathing and related systemic problems.

Limited evidence suggests that repeated or long-term occupational exposure may produce cumulative health effects involving organs or biochemical systems.

## Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
<a href="#">tris(hydroxymethyl)aminomethane hydrochloride</a>	1185-53-1	6
<a href="#">tris(hydroxymethyl)aminomethane</a>	77-86-1	6
<a href="#">water</a>	7732-18-5	88

## Section 4 - FIRST AID MEASURES

#### SWALLOWED

· If swallowed do NOT induce vomiting. · If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.

#### EYE

■ If this product comes in contact with the eyes: · Wash out immediately with fresh running water. · Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.

#### SKIN

■ If skin contact occurs: · Immediately remove all contaminated clothing, including footwear · Flush skin and hair with running water (and soap if available).

#### INHALED

· If fumes or combustion products are inhaled remove from contaminated area. · Lay patient down. Keep warm and rested.

#### NOTES TO PHYSICIAN

■ Treat symptomatically.

## Section 5 - FIRE FIGHTING MEASURES

Vapour Pressure (mmHG):	Not Available
Upper Explosive Limit (%):	Not Available
Specific Gravity (water=1):	Not Available
Lower Explosive Limit (%):	Not Available

### EXTINGUISHING MEDIA

■ The product contains a substantial proportion of water, therefore there are no restrictions on the type of extinguishing media which may be used. Choice of extinguishing media should take into account surrounding areas.

Though the material is non-combustible, evaporation of water from the mixture, caused by the heat of nearby fire, may produce floating layers of combustible substances.

In such an event consider:

- foam.
- dry chemical powder.
- carbon dioxide.

### FIRE FIGHTING

- Alert Emergency Responders and tell them location and nature of hazard.
- Wear breathing apparatus plus protective gloves for fire only.

### GENERAL FIRE HAZARDS/HAZARDOUS COMBUSTIBLE PRODUCTS

- The material is not readily combustible under normal conditions.
- However, it will breakdown under fire conditions and the organic component may burn.

Decomposes on heating and produces toxic fumes of: carbon dioxide (CO<sub>2</sub>), hydrogen chloride, phosgene, nitrogen oxides (NO<sub>x</sub>), other pyrolysis products typical of burning organic material.

May emit poisonous fumes.

May emit corrosive fumes.

### FIRE INCOMPATIBILITY

■ None known.

### PERSONAL PROTECTION

Glasses:

Chemical goggles.

Gloves:

1.NEOPRENE 2.VITON 3.BUTYL

Respirator:

Type A Filter of sufficient capacity

## Section 6 - ACCIDENTAL RELEASE MEASURES

### MINOR SPILLS

- Clean up all spills immediately.
- Avoid breathing vapors and contact with skin and eyes.

### MAJOR SPILLS

- Moderate hazard.
- Clear area of personnel and move upwind.
- Alert Emergency Responders and tell them location and nature of hazard.

## Section 7 - HANDLING AND STORAGE

### PROCEDURE FOR HANDLING

- DO NOT allow clothing wet with material to stay in contact with skin.
- Avoid all personal contact, including inhalation.
- Wear protective clothing when risk of exposure occurs.

### RECOMMENDED STORAGE METHODS

- Polyethylene or polypropylene container.
- Packing as recommended by manufacturer.

### STORAGE REQUIREMENTS

#### SUITABLE CONTAINER

- Polyethylene or polypropylene container.
- Packing as recommended by manufacturer.

#### STORAGE INCOMPATIBILITY

■ None known.

#### STORAGE REQUIREMENTS

## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

## EXPOSURE CONTROLS

Source	Material	TWA ppm	TWA mg/m <sup>3</sup>	STEL ppm	STEL mg/m <sup>3</sup>	Peak ppm	Peak mg/m <sup>3</sup>	TWA F/CC	Notes
Canada - British Columbia Occupational Exposure Limits	tris(hydroxymethyl)aminomethane hydrochloride (Diesel fuel, as total hydrocarbons, Inhalable)		100 (V)						Skin
Canada - British Columbia Occupational Exposure Limits	tris(hydroxymethyl)aminomethane hydrochloride (Kerosene /Jet fuels, as total hydrocarbon vapour, Revised 2003)		200 (P)						Skin
Canada - Alberta Occupational Exposure Limits	tris(hydroxymethyl)aminomethane hydrochloride (Kerosene/Jet fuels, as total hydrocarbon vapour)		200						
Canada - Saskatchewan Occupational Health and Safety Regulations - Contamination Limits	tris(hydroxymethyl)aminomethane hydrochloride (Diesel fuel as total hydrocarbons, (vapour))		100		150				Skin
Canada - Alberta Occupational Exposure Limits	tris(hydroxymethyl)aminomethane hydrochloride (Diesel fuel, as total hydrocarbons)		100						
US - Oregon Permissible Exposure Limits (Z-3)	tris(hydroxymethyl)aminomethane hydrochloride (Inert or Nuisance Dust: (d) Total dust)		10						Oregon Permissible Exposure Limits (PELs) are different than the federal limits.
US OSHA Permissible Exposure Levels (PELs) - Table Z3	tris(hydroxymethyl)aminomethane hydrochloride (Inert or Nuisance Dust: (d) Respirable fraction)		5						
US OSHA Permissible Exposure Levels (PELs) - Table Z3	tris(hydroxymethyl)aminomethane hydrochloride (Inert or Nuisance Dust: (d) Total dust)		15						
US - Hawaii Air Contaminant Limits	tris(hydroxymethyl)aminomethane hydrochloride (Particulates not other wise regulated - Total dust)		10						
US - Hawaii Air Contaminant Limits	tris(hydroxymethyl)aminomethane hydrochloride (Particulates not other wise regulated - Respirable fraction)		5						

US - Oregon Permissible Exposure Limits (Z-3)	tris(hydroxymethyl)aminomethane hydrochloride (Inert or Nuisance Dust:(d) Respirable fraction)	5	Oregon Permissible Exposure Limits (PELs) are different than the federal limits.
Canada - British Columbia Occupational Exposure Limits	tris(hydroxymethyl)aminomethane hydrochloride (Particles (Insoluble or Poorly Soluble) Not Otherwise Classified (PNOC))	10 (N)	
US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants	tris(hydroxymethyl)aminomethane hydrochloride (Particulates not otherwise regulated (PNOR)(f)- Respirable fraction)	5	
US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants	tris(hydroxymethyl)aminomethane hydrochloride (Particulates not otherwise regulated Respirable fraction)	5	
US - California Permissible Exposure Limits for Chemical Contaminants	tris(hydroxymethyl)aminomethane hydrochloride (Particulates not otherwise regulated Respirable fraction)	5	(n)
US - Oregon Permissible Exposure Limits (Z-1)	tris(hydroxymethyl)aminomethane hydrochloride (Particulates not otherwise regulated (PNOR) (f) Total Dust)	10	Bold print identifies substances for which the Oregon Permissible Exposure Limits (PELs) are different than the federal Limits. PNOR means "particles not otherwise regulated."
US - Michigan Exposure Limits for Air Contaminants	tris(hydroxymethyl)aminomethane hydrochloride (Particulates not otherwise regulated, Respirable dust)	5	
Canada - Prince Edward Island Occupational Exposure Limits	tris(hydroxymethyl)aminomethane hydrochloride (Particles (Insoluble or Poorly Soluble) [NOS] Inhalable particles)	10	See Appendix B current TLV/BEI Book

US - Oregon Permissible Exposure Limits (Z-1)	tris(hydroxymethyl)aminomethane hydrochloride (Particulates not otherwise regulated (PNOR) (f) Respirable Fraction)	-	5
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Bold print identifies substances for which the Oregon Permissible Exposure Limits (PELs) are different than the federal Limits. PNOR means "particles not otherwise regulated."

#### ENDOELTABLE

The following materials had no OELs on our records

- water: CAS:7732-18-5

#### PERSONAL PROTECTION



#### RESPIRATOR

Type A Filter of sufficient capacity

#### EYE

- Safety glasses with side shields.
- Chemical goggles.

#### HANDS/FEET

■ Wear chemical protective gloves, eg. PVC.

Suitability and durability of glove type is dependent on usage. Important factors in the selection of gloves include: such as:

- frequency and duration of contact,
- chemical resistance of glove material,
- glove thickness and
- dexterity

Select gloves tested to a relevant standard (e.g. Europe EN 374, US F739).

- When prolonged or frequently repeated contact may occur, a glove with a protection class of 5 or higher (breakthrough time greater than 240 minutes according to EN 374) is recommended.
- When only brief contact is expected, a glove with a protection class of 3 or higher (breakthrough time greater than 60 minutes according to EN 374) is recommended.
- Contaminated gloves should be replaced.

Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturiser is recommended.

#### OTHER

- Overalls.
- P.V.C. apron.
- Barrier cream.
- Skin cleansing cream.
- Eye wash unit.

#### ENGINEERING CONTROLS

■ Local exhaust ventilation usually required. If risk of overexposure exists, wear an approved respirator.

## Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

#### PHYSICAL PROPERTIES

Liquid.

State	Liquid	Molecular Weight	Not Applicable
Melting Range (°F)	Not Available	Viscosity	Not Available
Boiling Range (°F)	Not Available	Solubility in water (g/L)	Not Available
Flash Point (°F)	Not Available	pH (1% solution)	Not Available
Decomposition Temp (°F)	Not Available	pH (as supplied)	Not Available
Autoignition Temp (°F)	Not Available	Vapour Pressure (mmHG)	Not Available
Upper Explosive Limit (%)	Not Available	Specific Gravity (water=1)	Not Available
Lower Explosive Limit (%)	Not Available	Relative Vapor Density (air=1)	Not Available
Volatile Component (%vol)	Not Available	Evaporation Rate	Not Available

## APPEARANCE

Liquid.

Because of their structure, all the substances are highly soluble in water, have very low vapor pressures, possess relatively low partition coefficients (log Kow's), and similar dissociation constants, making them likely to remain dissolved in the water compartment upon the event of an environmental release, where biodegradation is ultimately expected. MacKay Level III fugacity modeling predicts that TRIS AMINO and the surrogate substances will tend to partition predominately to water. There is also a low potential to bioaccumulate in aquatic organisms based on low log Kow values. The high water solubility and negligible vapor pressure of all three substances support the low estimated Henry's Law Constants ( $4.54 \times 10^{-8}$  and  $6.48 \times 10^{-10}$  Pa m<sup>3</sup>/mol for TRIS AMINO and AMP, respectively, and  $8.67 \times 10^{-13}$  atm-m<sup>3</sup>/mole for AMPD).

Material	Value
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## Section 10 - CHEMICAL STABILITY

### CONDITIONS CONTRIBUTING TO INSTABILITY

- Presence of incompatible materials.
- Product is considered stable.

### STORAGE INCOMPATIBILITY

- None known.

For incompatible materials - refer to Section 7 - Handling and Storage.

## Section 11 - TOXICOLOGICAL INFORMATION

Sigma-Aldrich Tris-HCl, 1 M Stock Solutions, pH 7.2

### TOXICITY AND IRRITATION

- unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances.

TRIS(HYDROXYMETHYL)AMINOMETHANE HYDROCHLORIDE:

WATER:

SIGMA-ALDRICH TRIS-HCL, 1 M STOCK SOLUTIONS, PH 7.2:

- No significant acute toxicological data identified in literature search.

■ Asthma-like symptoms may continue for months or even years after exposure to the material ceases. This may be due to a non-allergenic condition known as reactive airways dysfunction syndrome (RADS) which can occur following exposure to high levels of highly irritating compound. Key criteria for the diagnosis of RADS include the absence of preceding respiratory disease, in a non-atopic individual, with abrupt onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant. A reversible airflow pattern, on spirometry, with the presence of moderate to severe bronchial hyperreactivity on methacholine challenge testing and the lack of minimal lymphocytic inflammation, without eosinophilia, have also been included in the criteria for diagnosis of RADS. RADS (or asthma) following an irritating inhalation is an infrequent disorder with rates related to the concentration of and duration of exposure to the irritating substance. Industrial bronchitis, on the other hand, is a disorder that occurs as result of exposure due to high concentrations of irritating substance (often particulate in nature) and is completely reversible after exposure ceases. The disorder is characterised by dyspnea, cough and mucus production.

TRIS(HYDROXYMETHYL)AMINOMETHANE:

TOXICITY                      IRRITATION

Oral (rat) LD50: 5900 mg/kg Nil Reported

- For tris(hydroxymethyl)aminomethane (TRIS AMINO; CAS 77-88-1) and its surrogates 2-amino-2-methyl-1,3-propanediol (AMPD; CAS 115-69-5) and monoisobutanolamine (AMP; CAS 124-68-5)

TRIS AMINO and the surrogate chemicals have displayed little if any toxicity to humans during their long history of use as human drugs and/or in personal care products and cosmetics. TRIS AMINO has found use as an IV drug for the management of acidosis in humans for many years and the toxicity of AMPD and AMP have been reviewed by the Cosmetic Ingredient Review Expert Panel which concluded that these materials are safe as used in cosmetic formulations up to 1%

Acute toxicity: Mammalian toxicity studies have displayed similar results. The oral LD50 value for TRIS AMINO is 5500 mg/kg in the mouse, and its surrogates range from 2150 to greater than 5000 mg/kg in the rat and mouse. TRIS AMINO was non-irritating to eyes

when a 40% aqueous solution was applied to the eyes of rabbits (pH 10.4 for 0.1M aqueous solution). In contrast, 95% AMP in water was severely irritating to the eyes, presumably due to the severely alkaline pH of the test solution used (pH 11.3 for 0.1M aqueous solution); however, more neutral cosmetic formulations containing lower concentrations of AMP are only minimally irritating. There is no sensitisation data available for TRIS AMINO; however, based on the following data, TRIS AMINO is not expected to be a sensitiser. Laboratory animal test samples of AMP did not cause allergic skin reactions when tested in guinea pigs following topical or intradermal administration. In patch tests with humans, AMP and cosmetic formulations containing either AMP or AMPD were negative for dermal sensitisation.

Repeated dose toxicity: Repeated-dose mammalian toxicity studies conducted on TRIS AMINO and the two surrogate chemicals indicate that the compounds are generally well-tolerated at concentrations as high as 500 mg/kg/day via IV infusion for TRIS AMINO and ingestion of up to 3200 ppm in the rodent diet (250-750 mg/kg/day for rats and mice, estimated). A number of human clinical trials of the IV infusion of TRIS AMINO have also been successfully conducted. In all studies, the only target tissue, when observed at all, has been the liver with AMP. Human clinical studies with Keterolac(a major component of which is TRIS AMINO) have suggested that patients with decreased liver function not be given the drug over extended treatment periods based upon changes in several clinical chemistry parameters. Ingestion of relatively high dosages of AMP has caused liver histopathological changes in rats and dogs. The most significant toxicological activity has been a foetotoxic effect of AMP when ingested at relatively high levels by pregnant rats. Subsequent dermal exposure to comparable dosages failed to elicit a developmental effect in rats. Overall, there have been no consistently-noted observations or treatment-related findings among the numerous repeated-dose mammalian toxicity studies that have been conducted over at least 50 years on these compounds that would indicate long-term significant toxicity of either compound at typical human exposure levels. Reflective of these findings is the fact that both TRIS AMINO and AMP display similar patterns of excretion from the body, being primarily eliminated unchanged via the urine over a relatively short period of time. Further, no evidence of either direct reactivity or metabolism to reactive species toward genetic material has been observed. Genetic toxicity: Studies conducted on the TRIS AMINO and the surrogate substances in the presence or absence of mammalian metabolic enzymes have all been negative.

### CARCINOGEN

VPVB_(VERY~	US - Maine Chemicals of High Concern List	Carcinogen	CA Prop 65; IARC; NTP 11th ROC
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### SKIN

tris(hydroxymethyl)aminomethane hydrochloride	Canada - Alberta Occupational Exposure Limits - Skin	Substance Interaction	1
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## Section 12 - ECOLOGICAL INFORMATION

No data

### Ecotoxicity

Ingredient	Persistence: Water/Soil	Persistence: Air	Bioaccumulation	Mobility
tris(hydroxymethyl)aminomethane	LOW		LOW	HIGH

## Section 13 - DISPOSAL CONSIDERATIONS

### Disposal Instructions

All waste must be handled in accordance with local, state and federal regulations.

‡ Legislation addressing waste disposal requirements may differ by country, state and/ or territory. Each user must refer to laws operating in their area. In some areas, certain wastes must be tracked.

A Hierarchy of Controls seems to be common - the user should investigate:

- Reduction
- Reuse
- Recycling
- Disposal (if all else fails)

This material may be recycled if unused, or if it has not been contaminated so as to make it unsuitable for its intended use. If it has been contaminated, it may be possible to reclaim the product by filtration, distillation or some other means. Shelf life considerations should also be applied in making decisions of this type. Note that properties of a material may change in use, and recycling or reuse may not always be appropriate.

DO NOT allow wash water from cleaning equipment to enter drains. Collect all wash water for treatment before disposal.

- Recycle wherever possible.
- Consult manufacturer for recycling options or consult Waste Management Authority for disposal if no suitable treatment or disposal facility can be identified.

## Section 14 - TRANSPORTATION INFORMATION

NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS: DOT, IATA, IMDG

## Section 15 - REGULATORY INFORMATION

### Regulations for ingredients

**tris(hydroxymethyl)aminomethane hydrochloride (CAS: 1185-53-1) is found on the following regulatory lists;**

"Canada Domestic Substances List (DSL)","US DOE Temporary Emergency Exposure Limits (TEELs)","US Toxic Substances Control Act (TSCA) - Inventory"

**tris(hydroxymethyl)aminomethane (CAS: 77-86-1) is found on the following regulatory lists;**

"Canada Toxicological Index Service - Workplace Hazardous Materials Information System - WHMIS (English)","International Council of Chemical Associations (ICCA) - High Production Volume List","International Fragrance Association (IFRA) Survey: Transparency List","OECD Representative List of High Production Volume (HPV) Chemicals","US DOE Temporary Emergency Exposure Limits (TEELs)","US EPA High Production Volume Program Chemical List","US Toxic Substances Control Act (TSCA) - Inventory"

**water (CAS: 7732-18-5) is found on the following regulatory lists;**

"Canada Toxicological Index Service - Workplace Hazardous Materials Information System - WHMIS (English)","IMO IBC Code Chapter 18: List of products to which the Code does not apply","International Fragrance Association (IFRA) Survey: Transparency List","OECD Representative List of High Production Volume (HPV) Chemicals","US - Pennsylvania - Hazardous Substance List","US DOE Temporary Emergency Exposure Limits (TEELs)","US NFPA 30B Manufacture and Storage of Aerosol Products - Chemical Heat of Combustion","US Toxic Substances Control Act (TSCA) - Inventory","US TSCA Section 8 (a) Inventory Update Rule (IUR) - Partial Exemptions"

**No data for Sigma-Aldrich Tris-HCl, 1 M Stock Solutions, pH 7.2 (CW: 5671560)**

## Section 16 - OTHER INFORMATION

*Reasonable care has been taken in the preparation of this information, but the author makes no warranty of merchantability or any other warranty, expressed or implied, with respect to this information. The author makes no representations and assumes no liability for any direct, incidental or consequential damages resulting from its use. For additional technical information please call our toxicology department on +800 CHEMCALL.*

■ Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.

A list of reference resources used to assist the committee may be found at:  
[www.chemwatch.net/references](http://www.chemwatch.net/references).

■ The (M)SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

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