

MATERIAL SAFETY DATA SHEET

TRIS BASE

SECTION 1 - MATERIAL IDENTIFICATION AND INFORMATION

MANUFACTURER'S NAME: GENOMIC SOLUTIONS, INC.
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CAS NUMBER: 77-86-1
RTECS NUMBER: TY2900000

SUBSTANCE: TRIS BASE

TRADE NAMES/SYNONYMS:

80-0077, TRIS BASE, 500G; 80-0160, TRIS BASE, 2500G; 2-AMINO-2- (HYDROXYMETHYL) -1,3-PROPANEDIOL; AMINOTRIMETHYLOLMETHANE; AMINOTRIS (HYDROXYMETHYL) METHANE; TRIMETHYLOLAMINOMETHANE; TRIS (BUFFERING AGENT); TRIS BUFFER; TRIS (HYDROXYMETHYL) METHANAMINE; TRIS (HYDROXYMETHYL) METHYLAMINE; TRIS (METHYLOLAMINO) METHANE; TROMETHAMINE; TROMETHANE; TROMETHANMIN; TRISAMINE; TRIS (HYDROXYMETHYL) AMINOMETHANE; 1,3-PROPANEDIOL, 2-AMINO-2- (HYDROXYMETHYL) -; TRIS (HYDROXYMETHYL) AMINOMETHANE; C4H11NO3.

CHEMICAL FAMILY: AMINE, HYDROXYL, ALIPHATIC

CREATION DATE: 6/14/95
REVISED: 2/20/98

SECTION 2 - PHYSICAL / CHEMICAL CHARACTERISTICS

COMPONENT: TRIS(HYDROXYMETHYL)AMINOMETHANE
CAS NUMBER: 77-86-1
PERCENTAGE: 100
OTHER CONTAMINANTS: NONE

PHYSICAL AND CHEMICAL PROPERTIES

DESCRIPTION: Odorless, hygroscopic, crystalline mass or white crystalline powder
MOLECULAR WEIGHT: 121.14
MOLECULAR FORMULA: (H-O-C-H₂)₃-C-N-H₂
MELTING POINT: 340-342 F (171-172 C)
BOILING POINT: 426-428 F (219-220 C) @ 10 mmHg
VAPOR PRESSURE: no data available
VAPOR DENSITY: N/A
SPECIFIC GRAVITY: not available
WATER SOLUBILITY: 55%
VOLATILITY:
pH: 10.4 @ 1.2% solution
ODOR THRESHOLD: no data available
EVAPORATION RATE: N/A

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SOLVENT SOLUBILITY: Moderately soluble in methanol, ethanol, ethylene glycol, dimethylformamide; slightly soluble in acetone, ether; very slightly soluble in ethyl acetate, cyclohexane, chloroform, carbon tetrachloride.

SECTION 3 - FIRE AND EXPLOSION HAZARD DATA

CERCLA RATINGS (SCALE 0-3): HEALTH = 2 FIRE = 1 REACTIVITY = 0 PERSISTENCE = 0

NFPA RATINGS (SCALE 0-4): HEALTH = 2 FIRE = 1 REACTIVITY = 0

EMERGENCY OVERVIEW:

Odorless, hygroscopic, crystalline mass or white crystalline powder. Causes respiratory tract, skin and eye irritation. Avoid breathing dust. Avoid contact with eyes, skin and clothing. Keep container tightly closed. Wash thoroughly after handling. Use only with adequate ventilation.

POTENTIAL HEALTH EFFECTS

INHALATION:

Short Term Effects: May cause irritation. Additional effects may include coughing, chest pain and difficulty breathing.

Long Term Effects: No information is available.

SKIN CONTACT:

Short Term Effects: May cause irritation.

Long Term Effects: Same effects as short term exposure.

EYE CONTACT:

Short Term Effects: May cause irritation. Additional effects may include eye damage.

Long Term Effects: Same effects as short term exposure.

INGESTION:

Short Term Effects: May cause gastrointestinal irritation. Additional effects may include burns, digestive disorders and weakness.

Long Term Effects: No information is available.

CARCINOGEN STATUS:

OSHA: N

NTP: N

IARC: N

FIRE FIGHTING MEASURES

FIRE AND EXPLOSION HAZARD:

Slight fire hazard when exposed to heat or flame.

EXTINGUISHING MEDIA:

Dry chemical, carbon dioxide, water spray or regular foam (1993 Emergency Response Guidebook, RSPA P 5800.6).

For larger fires, use water spray, fog or regular foam (1993 Emergency Response Guidebook, RSPA P 5800.6).

FIREFIGHTING:

Move container from fire area if you can do it without risk. Do not scatter spilled material with high-pressure water streams. Dike fire-control water for later disposal (1993 Emergency Response Guidebook, RSPA P 5800.6, Guide Page 31).

Use agents suitable for type of surrounding fire. Avoid breathing hazardous vapors, keep upwind.

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FLASH POINT: no data available
LOWER FLAMMABLE LIMIT: no data available
UPPER FLAMMABLE LIMIT: no data available
AUTOIGNITION: no data available

HAZARDOUS COMBUSTION PRODUCTS:

Thermal decomposition products may include toxic oxides of carbon and nitrogen.

SECTION 4 - REACTIVITY HAZARD DATA

STABILITY AND REACTIVITY

REACTIVITY:

Stable under normal temperatures and pressures.

CONDITIONS TO AVOID:

May burn but does not ignite readily. Avoid contact with strong oxidizers, excessive heat, sparks, or open flame.

INCOMPATIBILITIES:

TRIS(HYDROXYMETHYL)AMINOMETHANE:

ACIDS: Vigorous reaction
ALKALIES (STRONG): Incompatible
ALUMINUM: Corrosive
BRASS: Corrosive
COPPER: Corrosive
OXIDIZERS (STRONG): Fire and explosion hazard

HAZARDOUS DECOMPOSITION:

Thermal decomposition products may include toxic oxides of carbon and nitrogen.

POLYMERIZATION:

Hazardous polymerization has not been reported to occur under normal temperatures and pressures.

SECTION 5 - HEALTH HAZARD DATA

EMERGENCY FIRST AID

INHALATION:

First Aid - Remove from exposure area to fresh air immediately. Perform artificial respiration if necessary. Keep person warm and at rest. Treat symptomatically and supportively. Get medical attention immediately.

SKIN CONTACT:

First Aid - Remove contaminated clothing and shoes immediately. Wash with soap or mild detergent and large amounts of water until no evidence of chemical remains (at least 15-20 minutes). Get medical attention immediately.

EYE CONTACT:

First Aid - Wash eyes immediately with large amounts of water or normal saline, occasionally lifting upper and lower lids, until no evidence of chemical remains (at least 15-20 minutes). Get medical attention immediately.

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INGESTION:

First Aid - If vomiting occurs, keep head lower than hips to help prevent aspiration. Treat symptomatically and supportively. Get medical attention if needed.

NOTE TO PHYSICIAN

ANTIDOTE: No specific antidote. Treat symptomatically and supportively.

TOXICOLOGY INFORMATION

TRIS(HYDROXYMETHYL)AMINOMETHANE:

TOXICITY DATA:

5900 mg/kg oral-rat LD50

1800 mg/kg intravenous-rat LD50

1000 mg/kg oral-rabbit LDLo

1210 mg/kg intravenous-mouse LD50

CARCINOGEN STATUS: None

LOCAL EFFECTS: Irritant- inhalation, skin, eye

ACUTE TOXICITY LEVEL: Slightly toxic by ingestion

TARGET EFFECTS: No data available

HEALTH EFFECTS

INHALATION:

TRIS(HYDROXYMETHYL)AMINOMETHANE:

IRRITANT.

Acute Exposure: May cause irritation of the mucous membranes with tightness and pain in the chest, coughing, and difficulty breathing.

Chronic Exposure: No data available.

SKIN CONTACT:

TRIS(HYDROXYMETHYL)AMINOMETHANE:

IRRITANT.

Acute Exposure: May cause irritation with redness, pain, and possibly sensitization.

Chronic Exposure: May cause dermatitis due to irritation or sensitization.

EYE CONTACT:

TRIS(HYDROXYMETHYL)AMINOMETHANE:

IRRITANT.

Acute Exposure: May cause irritation with redness, pain, and possibly corneal damage.

Chronic Exposure: Prolonged or repeated exposure to irritants may cause conjunctivitis.

INGESTION:

TRIS(HYDROXYMETHYL)AMINOMETHANE:

Acute Exposure: May cause gastrointestinal irritation and possibly burns to the mouth and stomach. Large doses to laboratory animals caused weakness, collapse and death. The estimated fatal dose is 50 grams.

Chronic Exposure: No data available.

SECTION 6 - CONTROL AND PROTECTIVE MEASURES

EXPOSURE LIMITS:

No occupational exposure limits established by OSHA, ACGIH, or NIOSH.

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VENTILATION:

Provide local exhaust ventilation. Ventilation equipment should be explosion-proof if explosive concentrations of dust, vapor or fume are present.

EYE PROTECTION:

Employee must wear splash-proof or dust-resistant safety goggles to prevent contact with this substance.

EMERGENCY WASH FACILITIES:

Where there is any possibility that an employee's eyes and/or skin may be exposed to this substance, the employer should provide an eye wash fountain and quick drench shower within the immediate work area for emergency use.

CLOTHING:

Employee must wear appropriate protective (impervious) clothing and equipment to prevent repeated or prolonged skin contact with this substance.

GLOVES:

Employee must wear appropriate protective gloves to prevent contact with this substance.

RESPIRATOR:

The following respirators are recommended based on information found in the physical data, toxicity and health effects sections. They are ranked in order from minimum to maximum respiratory protection.

The specific respirator selected must be based on contamination levels found in the work place, must be based on the specific operation, must not exceed the working limits of the respirator and must be jointly approved by the National Institute for Occupational Safety and Health and the Mine Safety and Health Administration (NIOSH-MSHA).

Any dust and mist respirator.

Any air-purifying respirator with a high-efficiency particulate filter.

Any powered air-purifying respirator with a dust and mist filter.

Any powered air-purifying respirator with a high-efficiency particulate filter.

Any type 'C' supplied-air respirator operated in the pressure-demand or other positive pressure or continuous-flow mode.

Any self-contained breathing apparatus.

FOR FIREFIGHTING AND OTHER IMMEDIATELY DANGEROUS TO LIFE OR HEALTH CONDITIONS:

Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode.

Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive-pressure mode.

SECTION 7 - PRECAUTIONS FOR SAFE HANDLING & USE/LEAK PROCEDURES

ACCIDENTAL RELEASE MEASURES

OCCUPATIONAL SPILL:

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Sweep up and place in suitable clean, dry containers for reclamation or later disposal. Do not flush spilled material into sewer. Keep unnecessary people away.

HANDLING AND STORAGE

Observe all federal, state and local regulations when storing this substance. Store away from incompatible substances. Store in a cool, dry place; keep container tightly closed when not in use.

DISPOSAL INFORMATION

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

SECTION 8 - TRANSPORTATION AND REGULATORY INFORMATION
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TRANSPORTATION INFORMATION:

No classification currently assigned

REGULATORY INFORMATION:

TSCA STATUS:	Y
CERCLA SECTION 103 (40CFR302.4):	N
SARA SECTION 302 (40CFR355.30):	N
SARA SECTION 304 (40CFR355.40):	N
SARA SECTION 313 (40CFR372.65):	N
OSHA PROCESS SAFETY (29CFR1910.119):	N
CALIFORNIA PROPOSITION 65:	N

SARA HAZARD CATEGORIES, SARA SECTIONS 311/312 (40 CFR 370.21)

ACUTE HAZARD:	Y
CHRONIC HAZARD:	N
FIRE HAZARD:	N
REACTIVITY HAZARD:	N
SUDDEN RELEASE HAZARD:	N

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While the information and recommendations set forth herein are believed to be accurate as of the date hereof, ESA, Inc. makes no warranty with respect thereto and disclaims all liability from reliance thereon.