

MATERIAL SAFETY DATA SHEET

TRITON (R) X-100

SECTION 1 - MATERIAL IDENTIFICATION AND INFORMATION

MANUFACTURER'S NAME: GENOMIC SOLUTIONS , INC.
ADDRESS: 4355 VARSITY DR.
ANN ARBOR , MI 48108
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CAS NUMBER: 9036-19-5
RTECS NUMBER: RI0525000

SUBSTANCE: TRITON (R) X-100

TRADE NAMES/SYNONYMS:

80-0072, TRITON (R) X-100, 100ML; 80-0178, TRITON (R) X-100, 1000ML;
OCTYLPHENOXYPOLYETHOXYETHANOL; TRITON (R) X-100 SURFACTANT; OCTOXYNOL; POLY
(OXY-1,2-ETHANEDIYL), ALPHA-((1,1,3,3-TETRAMETHYLBUTYL)PHENYL) -OMEGA-HYDROXY-;
ALPHA-((1,1,3,3-TETRAMETHYLBUTYL)PHENYL)-OMEGA- HYDROXYPOLY(OXY-1, 2-ETHANEDIYL);
GLYCOLS, POLYETHYLENE, MONO (1,1,3,3-TETRAMETHYLBUTYL)PHENYL) ETHER,
POLYETHYLENE GLYCOLS MONO (1,1,3,3-TETRAMETHYLBUTYL)PHENYL) ETHER; OCTOXYNOL 9;
TRITON (R) X-100 (UNION CARBIDE); ETHOXYLATED OCTYLPHENOL.

CHEMICAL FAMILY: ALKYL ARYL POLYETHER ALCOHOL

CREATION DATE: 6/16/95
REVISED: 2/20/98

SECTION 2 - PHYSICAL / CHEMICAL CHARACTERISTICS

COMPONENT	CAS NUMBER	PERCENTAGE
OCTYLPHENOXYPOLYETHOXYETHANOL	9036-19-5	> 97.0
POLYETHYLENE GLYCOL	25322-68-3	< 3.0

OTHER CONTAMINANTS: MAY CONTAIN TRACE AMOUNTS OF ETHYLENE OXIDE

PHYSICAL AND CHEMICAL PROPERTIES

DESCRIPTION: Clear light colored liquid with a mild odor

MOLECULAR WEIGHT: 628 (approx.)

MOLECULAR FORMULA: C₈-H₁₇-C₆-H₄-(O-C-H₂-C-H₂)X-O-H

MELTING POINT: no data available

BOILING POINT: > 482 F (> 250 C) (decomposes)

VAPOR DENSITY: > 1

SPECIFIC GRAVITY: 1.07

WATER SOLUBILITY: complete

pH: 6-8 @ 5% solution

ODOR THRESHOLD: no data available

EVAPORATION RATE: (butyl acetate = 1) < 0.01

SOLVENT SOLUBILITY: Soluble in alcohol, acetone, benzene, toluene; insoluble in hexane, petroleum ether

POUR POINT: 45 F (7 C)

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VISCOSITY: 240 cP @ 25 C

SECTION 3 - FIRE AND EXPLOSION HAZARD DATA

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

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

EMERGENCY OVERVIEW:

Clear light colored liquid with a mild odor. Causes eye burns. Do not get in eyes, on skin, or on clothing. Wash thoroughly after handling.

POTENTIAL HEALTH EFFECTS

INHALATION:

Short Term Effects: No information available on significant adverse effects.

Long Term Effects: No information is available.

SKIN CONTACT:

Short Term Effects: No information available on significant adverse effects.

Long Term Effects: No information available on significant adverse effects.

EYE CONTACT:

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

Long Term Effects: Same effects as short term exposure.

INGESTION:

Short Term Effects: May cause vomiting and digestive disorders.

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.

FLASH POINT: 550 F (288 C) (CC)

LOWER FLAMMABLE LIMIT: no data available

UPPER FLAMMABLE LIMIT: no data available

AUTOIGNITION: no data available

FLAMMABILITY CLASS(OSHA): IIIB

HAZARDOUS COMBUSTION PRODUCTS:

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Thermal decomposition may release toxic and/or hazardous gases.

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.

Trace amounts of ethylene oxide, a carcinogen, may be present in this product. There is a potential for accumulation of ethylene oxide in the head space of containers or in enclosed areas where the product is stored, handled or used. Users should comply with 29 CFR 1910.1047.

INCOMPATIBILITIES:

TRITON (R) X-100:

OXIDIZERS (STRONG): Fire and explosion hazard

REDUCING AGENTS (STRONG): Fire and explosion hazard

HAZARDOUS DECOMPOSITION:

Thermal decomposition may release toxic and/or hazardous gases.

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, occasionally lifting upper and lower lids, until no evidence of chemical remains (at least 15-20 minutes). Continue irrigating with normal saline until the pH has returned to normal (30-60 minutes). Cover with sterile bandages. Get medical attention immediately.

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.

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TOXICOLOGY INFORMATION

TRITON (R) X-100:

IRRITATION DATA:

> 10% eye-rabbit severe (Rohm & Haas MSDS)

TOXICITY DATA:

1800 mg/kg oral-rat LD50

> 21.5 mg/L inhalation-rat LD50 (Rohm Haas MSDS)

> 3 gm/kg skin-rabbit LD50 (Rohm & Haas MSDS)

CARCINOGEN STATUS: None.

LOCAL EFFECTS: Corrosive - eye.

ACUTE TOXICITY LEVEL: Moderately toxic by inhalation, ingestion; slightly toxic by dermal absorption.

TARGET EFFECTS: No data available.

HEALTH EFFECTS

INHALATION:

TRITON (R) X-100:

Acute Exposure: The LD50 for rats was >21.5 mg/L

Chronic Exposure: No data available.

SKIN CONTACT:

TRITON (R) X-100:

Acute Exposure: No primary irritation or sensitization was noted when applied undiluted to 50 human subjects.

Chronic Exposure: Prolonged or repeated exposure may cause irritation.

EYE CONTACT:

TRITON (R) X-100:

CORROSIVE.

Acute Exposure: May cause severe irritation, corneal damage, and possibly permanent injury. In rabbit eyes, it produced severe irritation, and delayed damage. Permanent corneal damage occurred in animals at concentrations greater than 10%. In humans, polyethylene glycol ethers are reported to have caused corneal hyperesthesia, keratitis epitheliasis with almost complete loss of the epithelium, and corneal edema with wrinkling of the Descemet's membrane when present at 2% in an ointment. Some nonionic surfactants have an anesthetic effect on the cornea, which may eliminate the warning discomfort and allow severe damage to occur.

Chronic Exposure: Effects depend on the concentration and duration of exposure. Repeated or prolonged exposure to corrosive substances may cause conjunctivitis or effects as in acute exposure.

INGESTION:

TRITON (R) X-100:

Acute Exposure: The lethal dose reported in rats was 1800 mg/kg. Symptoms were not reported. Animals fed alkyl aryl polyether alcohol's exhibited gastrointestinal irritation with vomiting, diarrhea, and bloating, but little or no absorption or decomposition.

Chronic Exposure: No data available.

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SECTION 6 - CONTROL AND PROTECTIVE MEASURES

EXPOSURE LIMITS:

ETHYLENE OXIDE:

- 1 ppm OSHA TWA; 5 ppm OSHA 15 minute excursion limit
- 0.5 ppm OSHA TWA action level
- 1 ppm ACGIH TWA
- ACGIH A2-Suspected Human Carcinogen
- Not to exceed 0.1 ppm NIOSH recommended 8 hour TWA
- 5 ppm NIOSH recommended 10 minute ceiling

Measurement method: Charcoal tube (petroleum-based); dimethylformamide; gas chromatography with electron capture detection; (NIOSH Vol. III # 1614).

1000 pounds SARA Section 302 Threshold Planning Quantity
1 pound SARA Section 304 Reportable Quantity
10 pounds CERCLA Section 103 Reportable Quantity
5000 pounds OSHA Process Safety Management Threshold Quantity
Subject to SARA Section 313 Annual Toxic Chemical Release Reporting
Subject to California Proposition 65 cancer and/or reproductive toxicity warning and release requirements (February 27, 1987).

VENTILATION:

Provide local exhaust ventilation and/or general dilution ventilation to meet published exposure limits.

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 chemical cartridge respirator with organic vapor cartridge(s) and a full facepiece.

Any gas mask with organic vapor canister (chin-style or front- or back-mounted canister), with a full facepiece.

Any type 'C' supplied-air respirator with a full facepiece operated in pressure-demand or other positive pressure mode or with a full facepiece, helmet or hood operated in a continuous-flow mode.

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Any self-contained breathing apparatus with a full facepiece operated in pressure-demand or other positive pressure mode.

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:

Stop leak if you can do it without risk. For small spills, take up with sand or other absorbent material and place into clean, dry containers for later disposal. Keep unnecessary people away. Isolate hazard area and deny entry.

WATER SPILL:

The California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65) prohibits contaminating any known source of drinking water with substances known to cause cancer and/or reproductive toxicity.

HANDLING AND STORAGE

Observe all federal, state and local regulations when storing this substance. Store away from incompatible substances.

DISPOSAL INFORMATION

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

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SECTION 8 - TRANSPORTATION AND REGULATORY INFORMATION

TRANSPORTATION INFORMATION:

No classification currently assigned.

REGULATORY INFORMATION:

TSCA STATUS: Y
CERCLA SECTION 103 (40CFR302.4): Y
ETHYLENE OXIDE 10 pounds RQ
SARA SECTION 302 (40CFR355.30): Y
ETHYLENE OXIDE 1000 pounds TPQ
SARA SECTION 304 (40CFR355.40): Y
ETHYLENE OXIDE 1 pound RQ
SARA SECTION 313 (40CFR372..65): Y
ETHYLENE OXIDE
OSHA PROCESS SAFETY (29CFR1910.119): Y
ETHYLENE OXIDE 5000 pounds TQ
CALIFORNIA PROPOSITION 65: Y
ETHYLENE OXIDE

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

While the information and recommendations set forth herein are believed to be accurate as of the date hereof,

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