

MATERIAL SAFETY DATA SHEET

TRIETHANOLAMINE 99%



1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

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PRODUCT NAME: TRIETHANOLAMINE 99%

PRODUCT NUMBER: TEA99


UPC NUMBER:

PREPARED BY: Patricia Rodabaugh

DATE PREPARED: 6/23/2004

LAST REVISION: 3/17/2003

SYNONYMS: TEA 99



Portland, Oregon
Phoenix, Arizona
Auburn, Washington
Vancouver, Washington

Print Date: 11/22/2004

2. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS #	Weight %	OSHA PEL	ACGIH TLV	NOTE
Triethanolamine	102-71-6	>99.0	Not established	5 mg/m3	

3. HAZARDOUS IDENTIFICATION

EMERGENCY OVERVIEW: WARNING! Harmful if swallowed. May cause eye and skin irritation. Repeated exposure may cause blood effects, liver, and kidney damage-based on animal data. Do not add nitrites - may form suspected cancer causing nitrosamines.

POTENTIAL HEALTH EFFECTS

EYE CONTACT: Material may cause eye irritation, experienced as discomfort or pain, excess blinking and tear production, and seen as excess redness and swelling of the eye and possible injury to the cornea.

INHALATION: Vapors or mists, in excess of permissible concentrations, or in unusually high concentrations generated from spraying, heating the material or as from exposure in poorly ventilated areas or confined spaces, may cause irritation to the respiratory tract. Prolonged or repeated overexposure may result in the absorption of potentially harmful amounts of material.

INGESTION: May cause burning or painful sensations in the mouth, throat, chest and abdomen, nausea, vomiting, and diarrhea. May cause dizziness, drowsiness, faintness, weakness, collapse, and coma.

SKIN CONTACT: Brief contact may cause slight skin irritation with itching and redness. Prolonged contact, as with clothing wetted with material, may cause more severe irritation and discomfort, seen as local redness and swelling. Other than the potential skin irritation effects noted above, acute (short term) adverse effects are not expected from brief skin contact; see other effects, below and in toxicology section for information regarding potential long term effects.

SIGNS AND SYMPTOMS OF EXPOSURE:

Irritation to the nose, mouth, throat and lungs. Redness or burning of skin, blurred vision. Repeated overexposure may cause damage to kidneys and liver. Other effects of overexposure: Skin contact may cause sensitization and an allergic skin reaction in a small proportion of individuals.

4. FIRST AID MEASURES

- EYE CONTACT:** Hold eyelids apart and flush eyes with plenty of water for at least 15 minutes. Get medical attention.
- INHALATION:** If irritation, nausea, or drowsiness occurs, remove to fresh air. Get medical attention if breathing becomes difficult or respiratory irritation persists.
- INGESTION:** Do not give liquids if victim is unconscious or drowsy. Otherwise, give 2 glasses of water (16 oz.). Induce vomiting as directed by medical personnel. Do not induce vomiting or give anything by mouth to an unconscious or convulsing person.
- SKIN CONTACT:** Remove contaminated clothing. Wash affected area with plenty of soap and water. If irritation develops or persists, get medical attention. Launder clothing before reuse.

AGGRAVATED MEDICAL CONDITIONS:

Skin contact may aggravate an existing dermatitis. Repeated overexposure may aggravate existing liver or kidney disease. No adverse effects have been documented in humans as a result of chronic exposure. The toxicity section may contain applicable animal data. There is no specific antidote. Treatment of overexposure should be directed at the control of symptoms and the clinical condition of the patient. The hazards of this material are due mainly to its severely irritant properties on skin and mucosal surfaces.

SUPPLEMENTAL HEALTH INFORMATION:

Please see sections 11 and 16 for detailed information.

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES

FLASH POINT: 407 F (208 C)

FLASH POINT METHOD USED: N/A

AUTOIGNITION: NDA

LEL: 1.3 **UEL:** 9.8

EXTINGUISHING MEDIA:

Use water spray, foam, dry chemical, or CO₂. Use water spray to cool fire-exposed containers. Water or foam may cause frothing.

SPECIAL FIRE FIGHTING PROCEDURES:

Firefighters should wear proper protective equipment and self-contained breathing apparatus with full facepiece in positive pressure mode. Do not direct a solid stream of water or foam into burning molten material; this may cause spattering and spread the fire.

UNUSUAL FIRE AND EXPLOSION HAZARDS:

Contact with most metals causes formation of flammable and explosive hydrogen gas.

COMBUSTION PRODUCTS:

Toxic levels of ammonia, combustion products of nitrogen, carbon monoxide, carbon dioxide, irritating aldehydes and ketones may be formed on burning in a limited air supply.

6. ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IN CASE MATERIAL IS SPILLED OR RELEASED:

Ventilate area of leak or spill. Avoid breathing vapor. Wear appropriate personal protective equipment as specified in fire fighting section. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Wipe up or absorb with suitable material and shovel up. Prevent entry into sewers and waterways. Avoid contact with skin, eyes or clothing. Place absorbed material in a chemical waste container. Do not flush to sewer! US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities.

7. HANDLING AND STORAGE

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:

Handling: Do not add nitrites or other nitrosating agents. A nitrosamine, which may cause cancer, may be formed. Minimum feasible handling temperatures should be maintained. Storage: Periods of exposure to high temperatures should be minimized. Store above 60 F (16 C) to prevent crystallization.

OTHER PRECAUTIONS:

KEEP OUT OF REACH OF CHILDREN! Empty containers retain product residue and can be dangerous. Do not pressurize, cut weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition.

8. EXPOSURE CONTROL/PERSONAL PROTECTION

RESPIRATORY PROTECTION:

Airborne concentrations should be kept to lowest levels possible. If vapor, mist or dust is generated and the occupational exposure limit of the product or any component of the product is exceeded, use appropriate NIOSH or MSHA approved air purifying or air supplied respirator after determining the airborne concentration of the contaminant. Air supplied respirators should always be worn when airborne concentration of the contaminant or oxygen content is unknown.

VENTILATION:

Use general or local mechanical exhaust ventilation capable of maintaining emissions in the work area below the OSHA-PEL or ACGIH-TLV.

PROTECTIVE GLOVES:

Butyl poly vinyl chloride coated gloves were suggested by one vendor. Use protective clothing impervious to this material. Safety shower should be located in immediate work area. Remove contaminated clothing immediately, wash skin area several times daily with soap and water. Launder clothing before reuse.

EYE PROTECTION:

Avoid eye contact. Wear chemical goggles (recommended by ANSI Z87.1), unless a full face piece respirator is worn. Do not wear contact lenses.

OTHER PROTECTIVE CLOTHING OR EQUIPMENT:

Wear a neoprene or PVC apron or full protective clothing when handling product and neoprene boots. A eye wash station and safety shower should be available in the work area.

WORK / HYGENIC PRACTICES:

Use good personal hygiene when handling this product. Wash hands after use, before eating, drinking, smoking, or using the toilet.

ENGINEERING CONTROLS:

Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Process Hazard: Sudden release of hot organic chemical vapor or mists from process equipment operating at elevated temperature and pressure, or sudden ingress of air into hot equipment under a vacuum, may result in ignitions without the presence of obvious ignition sources. Published "autoignition" or "ignition" temperature values cannot be treated as safe operation temperatures in chemical processes without analysis of the actual process conditions. Any use of this product in elevated-temperature processes should be thoroughly evaluated to establish and maintain safe operating conditions.

EXPOSURE GUIDELINES:

May be harmful or fatal if swallowed. May irritate body tissues. Use with adequate ventilation. Avoid breathing vapor. Do not get in eyes, on skin, on clothing. Wash thoroughly after handling.

9. PHYSICAL AND CHEMICAL PROPERTIES

SOLUBILITY IN WATER: >10 (Soluble)

APPEARANCE AND ODOR: Clear, colorless to pale amber liquid or moist white solid. Ammonia-like.

BOILING POINT:	635.7 F (335.4 C)	PERCENT VOLATILE:	0.06 Wt%
VAPOR PRESSURE:	<0.001 mmHg at 20 C (68 F)	PH:	11
EVAPORATION RATE:	<0.01 (n-Butyl Acetate = 1)	MOLECULAR WEIGHT:	149.19 g/mol
POUNDS PER GALLON:	9.39	VAPOR DENSITY:	5, Heavier Than Air
SPECIFIC GRAVITY:	1.126	OTHER PROPERTIES:	VOC Content: 3 g/l
MELTING POINT:	NDA		
FREEZING POINT:	70.9 F (21.6 C)		

10. STABILITY AND REACTIVITY

STABILITY: Unstable

CONDITIONS TO AVOID: This material reacts violently with acids. This material is incompatible with strong oxidizing agents. This material is corrosive to copper, zinc, aluminum and their alloys. Do not add or formulate with nitrites. Temperatures above 250 degrees C. may undergo self-sustaining thermal decomposition.

INCOMPATIBILITY:

Avoid contact with : strong acids, strong bases, nitrates, strong oxidizing agents, aldehydes, ketones, acrylates, organic anhydrides, organic halides. Do not add nitrites. This product contains amines which can combine with nitrites or other nitrosating agents to form nitrosamines. Many nitrosamines have been found to cause cancer in laboratory animals. A component of this product carries "SKIN" notation as part of its exposure limit. "SKIN" notation indicates possible adverse health effects as a result of absorption through the skin mucous membranes, and eyes, by contact with vapor, mist spray, or liquid. Appropriate measure should be taken to minimize contact.

HAZARDOUS DECOMPOSITION OR BY PRODUCTS:

Carbon monoxide, carbon dioxide and other oxides may be generated as products of combustion. Toxic levels of ammonia, combustion products of nitrogen, carbon monoxide, carbon dioxide, irritating aldehydes and ketones may be formed on burning in a limited air supply.

HAZARDOUS POLYMERIZATION: Will Not Occur

CONDITIONS TO AVOID: None identified.

11. TOXICOLOGY INFORMATION

Toxicological information (animal toxicity data): Oral: LD50 Believed to be >2.00-5.00 g/kg (rat) slightly toxic, Inhalation: Believed to be practically non-toxic, Dermal: LD50 Believed to be >2.00g/kg (rabbit) practically non-toxic. Irritation Index, estimation of irritation (species): Skin: (Draize) Believed to be >.50-3.00/8.0 (rabbit) slightly irritating, Eyes: (Draize) Believed to be 25.00-50.00/110 (rabbit) moderately irritating, Sensitization: Not determined. TRIETHANOLAMINE SUBCHRONIC TOXICITY: Prolonged and repeated ingestion of Triethanolamine has caused kidney damage in laboratory animals. TRIETHANOLAMINE CARCINOGENICITY: The National Toxicology Program (NTP) has conducted a chronic (lifetime) dermal exposure study in rats and mice exposed to Triethanolamine (TEA). In this study, female rats dermally exposed to TEA concentrations of up to 250 mg of TEA per kg of body weight (mg/kg/day) did not show an increased incidence of tumors. However, male rats dermally exposed to TEA concentrations of 32 - 125 mg/kg/day showed a marginal increase in kidney tumors (renal tubule cell adenomas). Male mice dermally exposed to TEA concentrations of 100 - 2000 mg/kg/day showed a marginal increase in liver tumors (hepatocellular adenomas and hepatoblastomas). Female mice exposed to 100 - 1000 mg/kg/day showed an increased incidence of liver tumors (hepatocellular adenoma and carcinoma). In the study report, NTP has concluded that there is "no evidence" of cancer in female rats, "equivocal evidence" of kidney cancer in male rats and due to infection of the study animals with *Helicobacter hepaticus*, the male and female mouse studies were considered to be "inadequate studies." *Helicobacter hepaticus* is a bacterial agent known to cause liver cancers in infected animals. The NTP has sponsored a repeat study in mice that are believed to be free of *Helicobacter* infection. This study is currently underway. DIETHANOLAMINE (DEA) CARCINOGENICITY: In a chronic (2 year) exposure study, sponsored by the NTP, rats and mice were dermally exposed to DEA. Both male and female mice showed an increased incidence of liver tumors, and male mice showed an increased incidence of kidney tumors. In contrast, male and female rats did not show any increased incidence of tumors. NTP concluded, using their standard classification scheme, that there is "no evidence" of cancer in male and female rats, and "clear evidence" of liver and kidney cancer in male mice, and "clear evidence" of liver cancer in female mice. The American Chemistry Council (ACC) Alkanolamines Panel, with cooperation of the NTP, investigated the conduct of this study and concluded that the experimental design of the study was seriously flawed in a number of areas. In addition, the results of the NTP study are not consistent with other scientific studies investigation the carcinogenic potential of DEA. The flawed experimental design, as well as the inconsistency of the NTP mouse study results with other studies, have resulted in questions over the relevance of the NTP study to establish the risk of cancer in humans from exposures to DEA. The ACC Alkanolamines Panel is currently sponsoring mechanistic research on DEA, investigation the role of non-genotoxic mechanisms of carcinogenicity as applied to the DEA exposures in the NTP study. Results from this research program indicate that mice administered DEA via dermal (and oral) routes of exposure had significantly lower levels of choline and phosphocholine. Other research has shown that rodents chronically fed choline deficient diets, resulting in a choline/phosphocholine deficiency, develop liver tumors. In addition, due to the known differences in metabolism between rodents and humans, rodents are expected to be far more sensitive to the effects of choline depletion than humans. Although additional research in this area is still underway, the results to date of our research indicate that the tumors observed in the NTP mouse study resulted from mechanism that is not relevant to humans. See additional DEA toxicity information below.

12. ECOLOGICAL INFORMATION

When released into the soil, this material may leach into groundwater. This material may be toxic to aquatic life. When released into the air, this material may be removed from the atmosphere to a moderate extent by wet deposition. When released into the air, this material may be removed from the atmosphere to a moderate extent by dry deposition.

13. DISPOSAL CONSIDERATIONS

This product has been evaluated for RCRA characteristics and does not meet the criteria of a hazardous waste if discarded in its purchased form. Under RCRA, it is the responsibility of the user of the product to determine at the time of disposal, whether the product meets RCRA criteria for hazardous waste. This is because product uses, transformations, mixtures, processes, etc. may render the resulting materials hazardous. The preferred options for disposal are to send to licensed reclaimers, or to permitted incinerators. Any disposal practice must be in compliance with federal, state, and local regulations. Do not dump into sewers, ground, or

14. TRANSPORTATION INFORMATION

DOT Proper Shipping Name: Other Regulated Substances, Liquid,
N.O.S. (DIETHANOLAMINE)

PACKING GROUP: III
GUIDE NUMBER: 171

HAZARD CLASS: 9
UN NUMBER: NA 3082

DOT CLASS: Non Bulk: Not DOT Regulated

15. REGULATORY INFORMATION

This material is DOT regulated in bulk and not DOT regulated in drums. CERCLA 102(a)/DOT Hazardous Substances: N,N-Diethanolamine (CAS 111-42-2) RQ = 100. This product may contain <1.0000% N,N-Diethanolamine. This product, or its components, are listed on, or are exempt from the Toxic Substance Control Act (TSCA) Chemicals Substance Inventory.

16. OTHER INFORMATION

HMIS INFORMATION: **HEALTH:** 2 **FLAMMABILITY:** 1 **REACTIVITY:** 1 **PROTECTIVE:** H

SARA Title III Information:

- SARA 302:** To the best of our knowledge, none of the chemicals in this product are listed as an Extremely Hazardous Substance under Section 302 of SARA Title III nor does this product contain any other such substances.
- SARA 311/312:** This product should be reported as an immediate (acute) health hazard, a delayed (chronic) health hazard and a reactive hazard.
- SARA 313:** Diethanolamine (CAS 111-42-2) is listed. This product contains <1.0000% of this chemical.
- DEA Toxicity:** DEA developmental and reproductive toxicity: Laboratory animal studies investigating the developmental toxicity of DEA have indicated that DEA exposures, either oral (gavage) or dermal, do not result in any specific developmental toxicity. Although some minor developmental delays were observed in rat dermal exposure studies, these effects were secondary to extreme maternal toxicity from exposure to relatively high levels of DEA.
- Depending on container size, spills of this product may require reporting under SARA 304 and/or CERCLA 102(A) regulations. Please refer to regulatory information section for component RQ information.

California Proposition 65: The following detectable components of this product are substances, or belong to classes of substances, known to the State of California to cause cancer and/or reproductive toxicity. None.

N/A = Not Applicable

NDA = No Data Available

Disclaimer

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