Safety Data Sheet

For Compliance with OSHA 29 CFR 1910.1200 and ANSI Z400.1-1998

Section 1: Identification

Product Name Trolamine NF
Commercial Name Trolamine
Product Use Not available.
Restrictions On Use Not available.

Product Code 55-1097

Company
PCCA
9901 South Wilcrest
Houston, TX 77099
Phone: 1-800-331-2498
Fax: 1-800-874-5760

In case of emergency contact:
CHEMTREC (24hr) 1-800-424-9300

Section 2: Hazard(s) Identification

OSHA Haz Com: CFR 1910.1200 HMIS Classification Health hazard 1 Flammability 2 Physical hazards 1 NFPA Rating Health hazard 1 Fire 2 Reactivity Hazard 0

Signal Word WARNING

Hazard Statement(s) Harmful if swallowed. Harmful in contact with skin. Causes skin irritation. Causes serious eye irritation. Harmful if inhaled. May cause respiratory irritation.

Pictogram(s) or Symbol(s)

Precautionary Statement(s):

Prevention P261 Avoid breathing dust/ fume/ gas/ mist/ vapors/ spray. P280 Wear protective gloves/protective clothing/eye protection/face protection.

Response IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell. P302 P352 IF ON SKIN: Wash with plenty of soap and water P304 P340 IF INHALED: Remove victim to fresh air and keep at rest in a positioncomfortable for breathing. P305 P351 P338 IF IN EYES: Rinse cautiously with water for several minutes. Removecontact lenses, if present and easy to do. Continue rinsing. P332 P313 If skin irritation occurs: Get medical advice/ attention.

Storage Not available.

Disposal Not available.

Section 3: Composition/Information on Ingredients

Substance/Mixture Mixture
Components Triethanolamine and DIETHANOLAMINE
% By Weight >99 and <1
CAS# 102-71-6 and 111-42-
Molecular Weight 149.19 g/mole
Chemical Formula (HOCH2CH2)3N
Synonym(s) *Tri-(2-hydroxyethyl)amine* Triethanolamine*

Mixtures

Name	CAS#	% by Weight	TLV/PEL	LC50/LD50
Triethanolamine	102-71-6	>99	TWA: 5 (mg/m3)	ORAL (LD50): Acute: 2200 mg/kg [Guinea pig]. 5846 mg/kg [Mouse]. 2200 mg/kg [Rabbit].
DIETHANOLAMINE	111-42-2	< 1		

Section 4: First-Aid Measures

Inhalation Remove source of exposure or move to fresh air. Get medical advice/attention if you feel unwell or are concerned.

Skin Contact Rinse with lukewarm, gently flowing water for 5 minutes. If skin irritation occurs get medical advice/attention.

Eye Contact Rinse the contaminated eye(s) with lukewarm, gently flowing water for 5 minutes, while holding the eyelid(s) open. If eye irritation persists, get medical advice/attention.

Ingestion Call a Poison Centre or doctor if you feel unwell or are concerned.

Symptoms/Effects

Acute Inhalation: Symptoms of exposure may include coughing, wheezing, sore throat, difficult breathing. Skin Contact: Symptoms of irritation include local redness, dryness and discomfort. Eye Contact: Liquid, mists and/or vapor may cause eye irritation. Symptoms of irritation include redness, tears. Ingestion: Swallowing can cause irritation of the digestive tract, abdominal and chest pain, nausea, vomiting and diarrhea.

Delayed Inhalation: Symptoms of exposure may include coughing, wheezing, sore throat, difficult breathing. Skin Contact: Symptoms of irritation include local redness, dryness and discomfort. Eye Contact: Liquid, mists and/or vapor may cause eye irritation. Symptoms of irritation include redness, tears. Ingestion: Swallowing can cause irritation of the digestive tract, abdominal and chest pain, nausea, vomiting and diarrhea.

Immediate Medical Attention

Not available.

Section 5: Fire-Fighting Measures

Suitable Extinguishing Media

Water fog or fine spray, alcohol-resistant foam or dry chemical. Use water spray to cool fire-exposed containers.

Unsuitable Extinguishing Media

Violent steam generation or eruption may occur upon application of direct water stream to hot product. High pressure water streams may scatter hot liquid.

Products of Combustion

Product can burn if heated (Flash point of pure TEA = 177°C (350°F)). Auto-ignition temperature of TEA=324°C (615°F) Combustible if involved in a fire. Hazardous decomposition may occur above 200°C. During a fire, smoke may contain vaporized TEA and other unidentified toxic and/or irritating compounds. Combustion products may include toxic nitrogen oxide, hydrogen cyanide, formaldehyde carbon monoxide, carbon dioxide and ammonia gases. Heat from a fire can cause a rapid build-up of pressure inside containers, which may cause explosive rupture.

Firefighters Special Equipment and Precautions

Evacuate the area and fight fire from a safe distance or a protected location. Thermal decomposition products such as nitrogen oxides and hydrogen cyanide are hazardous to health. Do not enter without specialized protective equipment suitable for the situation. Approach the fire from upwind to avoid hazardous vapors. Burning liquids may be extinguished by dilution with water. Water spray may be used to flush spills away from ignition sources. Avoid all contact with this material during fire-fighting operations. Wear chemical resistant clothing (chemical splash suit) and positive-pressure self-contained breathing apparatus. Contain water run-off if possible.

Section 6: Accidental Release Measures

Personal precautions, protective equipment and emergency procedures: Isolate the area; keep all unprotected people away from the spill area. Extinguish or remove all ignition sources. Wear protective gloves, protective clothing and face protection (See Section 8). Ensure clean-up is conducted by trained personnel only. Do not touch or walk through the spilled material. Spilled material may pose a slipping hazard. Environmental precautions: Prevent material from contaminating soil and from entering sewers or waterways. Methods and material for containment and cleaning up: Stop the spill if it is safe to do so. Contain the spill with earth, sand or other suitable non-combustible absorbent. Keep materials which can burn away from spilled product. Do not absorb with sawdust, woodchips or other cellulose materials. Clean up spills immediately. Large spills: Pump spilled liquid into suitable containers. Small spills: Take up the liquid spill using an inert absorbent material. Scoop up spilled product and any contaminated absorbents into appropriate, labeled containers. Contaminated absorbent may pose the same hazards as the spilled product. Flush the area with water and collect wash-water for proper disposal.

Section 7: Handling and Storage

Precautions for safe handling: Wear personal protective gloves, clothing and other equipment required for the workplace. Avoid breathing fume/gas/mist/vapors/spray. Avoid generating airborne fumes/vapors/mist from this product. Handle this product with adequate ventilation. Wash hands and exposed skin thoroughly, immediately after exposure to product and at the end of the work-shift. Keep away from flames and hot surfaces. – No smoking. Prevent handling with incompatible materials such as strong acids and oxidizing agents. Prevent release of this material to the environment; prevent spills and keep away from drains. Never perform any welding, cutting, soldering, drilling or other hot work on an empty vessel, container or piping until all liquid and vapors have been cleared. Inspect containers for leaks before handling. Prevent damage to containers. Keep containers closed when not in use. Conditions for safe storage: Keep containers tightly closed when not in use. Store in a cool, dry and well-ventilated place. Store away from sunlight, heat and ignition sources. Store away from strong oxidants, strong acids and other incompatible materials (see Section 10). Do not store in containers made of aluminum, copper, brass or other copper alloys. Store separated from food and feedstuffs.

Section 8: Exposure Controls/Personal Protection

Exposure Limits

Triethanolamine ACGIH® TLV®: 5 mg/m3 U.S. OSHA PEL: Not available Other exposure limits: Ontario (Canada) TWA: 0.5 ppm (3.1 mg/m3) Diethanolamine (Inhalable fraction and vapor) ACGIH® TLV®: 1 mg/m3 Skin U.S. OSHA PEL: 15 mg/m3 (3 ppm) Other exposure limits: NIOSH REL: 3 ppm (15 mg/m3) Quebec (Canada) VEMP: 3 ppm (13 mg/m3)

Engineering Controls

Facilities utilizing or storing this material should be equipped with general or local exhaust ventilation, eyewash facilities and a safety shower. Ventilation system should be made of corrosion-resistant material. Maintain air concentrations below occupational exposure standards using engineering controls. Personal Protective Equipment (PPE) should be used as back-up protection to engineering controls.

Personal Protection

Eye/Face protection: Wear chemical safety goggles. If splashing is possible wear a face shield. Skin protection: Wear impervious, chemical protective gloves. Wear clean, body-covering, protective coveralls to prevent skin exposure. If spill or splashing is possible, wear impervious apron and chemical protective boots. Recommended materials for protective clothing include butyl rubber, neoprene rubber. Resistance of specific materials can vary from product to product; evaluate resistance under conditions of use and maintain clothing carefully. Respiratory protection: If concentrations in air exceed the occupational exposure limits, then wear respiratory protection. Respiratory protection should not be necessary unless the product is heated to release vapors or a mist is created. If airborne vapor or mist exposure is likely wear a chemical cartridge respirator with cartridges to protect against ethanolamine, or a powered air-purifying respirator with cartridges to protect against ethanolamine, or a full-face self-contained breathing apparatus. If respiratory protection is required, institute a complete respiratory protection program including selection, fit testing, training, maintenance and inspection. Consult with respirator manufacturer to determine respirator selection, use and limitations. For spills or uncontrolled releases, wear a supplied-air respirator. A respiratory protection program that meets the regulatory standard, such as Canadian Standards Association (CSA) Standard Z94.4 or OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements, must be followed whenever workplace conditions warrant a respirator's use.

Section 9: Physical and Chemical Properties

Appearance	Liquid. Viscous, clear, colorless.
Odor	Slight ammonia-like odor.
Odor Threshold	Not available.

Melting Point	Not available.	**pH**	10.5 (10% aqueous solution)
Freezing Point	21°C (70°F)	**Vapor Pressure**	<0.01 mmHg @ 20 °C
Boiling Point/Range	340°C (644°F)	**Vapor Density**	5.14(Air = 1)
Decomposition temperature	200°C (392°F)	**Viscosity**	601 mPa.s @ 25°C (dynamic)
Partition Coefficient: n-octanol/water	-2.53 Kow	**Evaporation Rate**	< 0.01 (n-Butyl Acetate = 1)
Flash Point	177°C (350°F)	**Autoignition temperature**	324°C (615°F)
Flammability	Not available.	**Flammability or Explosive Limits:**	
		Lower	1.5%
		Upper	Not available.

Solubility(ies)	Completely soluble in water.
Other	Not available.

Section 10: Stability and Reactivity

Reactivity	Not reactive under normal conditions of use.
Chemical Stability	Normally stable.
Hazardous Polymerization	Heating above 60°C in aluminum can result in corrosion and generation of flammable hydrogen gas.Reacts with cellulose nitrate causing fire and explosion hazard.Reacts violently with strong acids and strong oxidants (e.g. nitric acid, hydrogen peroxide), increasing risk of fire or explosion. Contact with nitrosating agents, under acidic conditions such as nitrous acid, nitrite or nitrogen oxides, can form nitrosamines some of which are potent carcinogens. Alkanolamine substances are decomposed by light and slowly oxidized by air, turning yellow and then brown. This reaction is accelerated by heat and the presence of metals. Alkanolamine substances are oxidized by air slowly with evolution of heat. This reaction may lead to spontaneous combustion if the substance is on an adsorbent or on a high surface area material (e.g. absorbent material or thermal insulation).
Conditions to Avoid	Avoid high temperatures and contact with sources of ignition. Avoid sunlight, air and moisture.
Incompatible Materials	Avoid contact with strong acids, strong oxidizing agents, halogenated hydrocarbons, nitrating agents, alkali metals, metal hydrides and aluminum. Product may be corrosive to aluminum alloys at elevated temperatures, many 400 series stainless steel alloys, copper, zinc, and aluminum bronze. In combination with water, the product may be corrosive to copper and copper alloys (e.g. brass), some aluminum alloys, zinc, zinc alloys, and galvanized surfaces. Triethanolamine attacks some polymers including polyvinylchloride, polyurethane, polyamide imide, high-density polyethylene and polyacetal at elevated temperatures.
Hazardous Decomposition Products	Decomposition products may include nitrogen oxides, ammonia, irritating aldehydes and ketones. Hazardous decomposition products depend upon temperature, air supply and the presence of other materials. Oxidation in air may form transient, organic peroxides or thermally unstable N-oxides such as hydroxylamines and carbamates form as well as nitrosamines, which are suspected cancer causing chemicals. Oxidation of Triethanolamine and decomposition is accelerated by light, heat, and/or presence of metals or metal oxides.

Section 11: Toxicological Information

RTECS KL9275000

Acute Toxicity
Triethanolamine (TEA) LD50 Oral: 4 190 mg/kg (rat) LD50 Dermal: >2 000 mg/kg (rabbit) LC50 Inhalation (4 hrs.): Not available
Diethanolamine (DEA) LD50 Oral: 1 600 mg/kg (rat) LD50 Dermal: 8 180 mg/kg (rabbit) LC50 Inhalation (4 hrs.): > 0.4 mg/L (rat)

Skin Corrosion/Irritation
not irritating to skin.

Serious Eye Damage/Irritation
not irritating to eyes.

Respiratory or Skin Sensitization
Contact skin allergy has been reported in people occupationally exposed to TEA in the textile industry and in metalworking fluids and to people non-occupationally exposed to TEA in cosmetics and medicines. Negative results have been obtained in animal skin sensitization tests performed according to OECD Guideline 406 (Skin Sensitization). Not known to be a respiratory sensitizer.

Germ Cell Mutagenicity
Not known to be a mutagen based on evidence from animal studies, cultured mammalian cells and bacterial studies.

Carcinogenicity
The agent is not classifiable as to carcinogenicity in humans.

Reproductive Toxicity
Not known to cause adverse reproductive effects. For TEA a NOAEL, oral exposure, was reported as 1000 mg/kg/day in rats.

Routes of Entry
Skin contact, Inhalation.

Symptoms Related to Exposure
Not available.

Potential Health Effects
Not available.

Target Organ(s) Not available.

Section 12: Ecological Information

Ecotoxicity
Information for TEA: Not harmful to fish, crustacea or algae. Freshwater fish: 96 Hr LC50 Pimephales promelas: 10600-13000 mg/L [flow-through] 96 Hr LC50 Pimephales promelas: >1000 mg/L [static] 96 Hr LC50 Lepomis macrochirus: 450-1000 mg/L [static] Crustacea: 24 Hr EC50 Daphnia magna: 1386 mg/L Algae: 72 Hr EC50 Desmodesmus subspicatus: 216 mg/L 96 Hr EC50 Desmodesmus subspicatus: 169 mg/L

Persistance and Degradability
Material is readily biodegradable in water according to OECD Test 301B for ready biodegradability. Theoretical oxygen demand (ThOD) is calculated to be 2.04 p/p. Inhibitory concentration (IC50) in OECD "Activated Sludge, Respiratory Inhibition Test" (Guideline #209) is > 1000 mg/L.

Bioaccumulative Potential
Low potential for bioaccumulation. Bioconcentration Factor (BCF) = <3.9 method: OECD 305C Log Pow = -2.3 @ 25°C

Mobility in Soil
Soluble in water; low potential for absorption in soil. Henry's Law Constant (H) is estimated to be 3.38E-19 atm m3/mole at 25°C. Log soil organic carbon partition coefficient (log Koc) =1.24 calculated.

Other Adverse Effects
Not dangerous for the ozone layer (According to EU Council Regulation No 1005/2009)

Section 13: Disposal Considerations

Waste Disposal

Do NOT discard into any sewers, on the ground or into any body of water. Store material for disposal as indicated in Section 7 Handling and Storage. Dispose of in accordance with local/regional/national/ international regulations. For unused, uncontaminated product, the preferred options include sending to a licensed, permitted recycler, reclaimer incinerator or other thermal destruction device. USA: 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.

Disposal of Container

Not available.

Other Considerations

Not available.

Section 14: Transport Information

DOT Classification

Not a DOT controlled material (United States). This material is not classified dangerous good according to international transportation regulations (ADR/RID-IMDG-ICAO/IATA).

Section 15: Regulatory Information

Regulations

OSHA: This material is not considered a hazardous chemical by the OSHA Hazard Communication Standard 29 CFR 1910.1200 (2012). Toxic Substances Control Act (TSCA) Section 8(b): All ingredients are listed on the TSCA Inventory. Additional USA regulatory lists: Clean Air Act -Triethanolamine. SARA Title III - Section 313. (Diethanolamine) California Safe Drinking Water and Toxic Enforcement Act, Proposition 65: Diethanolamine (CAS No. 111-42-2) is on the list of chemicals known to the State to cause cancer. State Right To Know (Diethanolamine): Massachusetts. New Jersey. Pennsylvania.

Other

Not available.

Section 16: Other Information

DO NOT USE INGREDIENT INFORMATION AND /OR INGREDIENT PERCENTAGES IN THIS MSDS AS A PRODUCT SPECIFICATION. FOR PRODUCT SPECIFICATION INFORMATION REFER TO A PRODUCT SPECIFICATION SHEET AND /OR A CERTIFICATE OF ANALYSIS. THESE CAN BE OBTAINED FROM YOUR LOCAL VOPAE USA SALES OFFICE. ALL INFORMATION APPEARING HEREIN IS BASED UPON DATA OBTAINED FROM THE MANUFACTURER AND /OR RECOGNIZED TECHNICAL SOURCES. WHILE THE INFORMATION IS BELIEVED TO BE ACCURATE, VOPAK MAKES NO REPRESE NTATIONS AS TO ITS ACCURACY OR SUFFICIENCY. CONDITIONS OF USE ARE BEYOND VOPAKS CONTROL AND THEREFORE USERS ARE RESPONSIBLE TO VERIFY THIS DATA UNDER THEIR OWN OPERATING CONDITIONS TO DETERMINE WHETHER THE PRODUCT IS SUITABLE FOR THEIR PARTICULAR PURPOSES AND THEY ASSUME ALL RISKS OF THEIR USE, HANDLING, AND DISPOSAL OF THE PRODUCT, OR FROM THE PUBLICATION OR USE OF, OR RELIANCE UPON , INFORMATION CONTAINED HEREIN. THIS INFORMATION RELATES ONLY TO THE PRODUCT DESIGNATED HEREIN, AND DOES NOT RELATE TO ITS USE IN COMBINATION WITH ANY OTHER MATERIAL OR IN ANY OTHER PROCESS.