

TRIETHANOLAMINE

TEA

CAUTIONARY RESPONSE INFORMATION

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| Common Synonyms Tris(Hydroxyethyl)amine Triethanolamine Trihydroxytriethylamine | | Oily liquid | Colorless | Mild ammonia odor |
| Sinks and mixes with water. Freezing point is 71°F. | | | | |
| <p>Call fire department. Avoid contact with liquid. Notify local health and pollution control agencies. Protect water intakes.</p> | | | | |
| Fire | Combustible. POISONOUS GASES MAY BE PRODUCED IN FIRE. Wear goggles and self-contained breathing apparatus. Extinguish with dry chemical, alcohol foam, or carbon dioxide. Water may be ineffective on fire. Cool exposed containers with water. | | | |
| Exposure | CALL FOR MEDICAL AID. LIQUID Irritating to skin and eyes. Harmful if swallowed. Remove contaminated clothing and shoes. Flush affected areas with plenty of water. IF IN EYES, hold eyelids open and flush with plenty of water. IF SWALLOWED and victim is CONSCIOUS, have victim drink water or milk. | | | |
| Water Pollution | Effect of low concentrations on aquatic life is unknown. May be dangerous if it enters water intakes. Notify local health and wildlife officials. Notify operators of nearby water intakes. | | | |

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| 1. CORRECTIVE RESPONSE ACTIONS Dilute and disperse Stop discharge | 2. CHEMICAL DESIGNATIONS 2.1 CG Compatibility Group: 8; Alkanolamine 2.2 Formula: (HOCH ₂ CH ₂) ₃ N 2.3 IMO/UN Designation: Not listed 2.4 DOT ID No.: Not listed 2.5 CAS Registry No.: 102-71-6 2.6 NAERG Guide No.: Not listed 2.7 Standard Industrial Trade Classification: 51451 |
| 3. HEALTH HAZARDS | |
| 3.1 Personal Protective Equipment: Goggles or face shield; rubber gloves and boots. 3.2 Symptoms Following Exposure: Liquid may irritate eyes and skin. 3.3 Treatment of Exposure: EYES: flush with water for at least 15 min.; call a doctor. SKIN: wipe off, wash with soap and water. 3.4 TLV-TWA: 5 mg/m ³ 3.5 TLV-STEL: Not listed. 3.6 TLV-Ceiling: Not listed. 3.7 Toxicity by Ingestion: Grade 2; LD ₅₀ = 0.5 to 5 g/kg (guinea pig). 3.8 Toxicity by Inhalation: Currently not available. 3.9 Chronic Toxicity: Currently not available 3.10 Vapor (Gas) Irritant Characteristics: Non-volatile 3.11 Liquid or Solid Characteristics: Minimum hazard. If spilled on clothing and allowed to remain, may cause smarting and reddening of the skin. 3.12 Odor Threshold: Currently not available 3.13 IDLH Value: Not listed. 3.14 OSHA PEL-TWA: Not listed. 3.15 OSHA PEL-STEL: Not listed. 3.16 OSHA PEL-Ceiling: Not listed. 3.17 EPA AEGL: Not listed | |

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| 4. FIRE HAZARDS 4.1 Flash Point: 375°F O.C. 355°F C.C. 4.2 Flammable Limits in Air: Currently not available 4.3 Fire Extinguishing Agents: Alcohol foam, dry chemical, or carbon dioxide 4.4 Fire Extinguishing Agents Not to Be Used: Water or foam may cause frothing. 4.5 Special Hazards of Combustion Products: Poisonous gases, such as NO _x , may be produced 4.6 Behavior in Fire: Not pertinent 4.7 Auto Ignition Temperature: Currently not available 4.8 Electrical Hazards: Not pertinent 4.9 Burning Rate: Currently not available 4.10 Adiabatic Flame Temperature: Currently not available 4.11 Stoichiometric Air to Fuel Ratio: 44.0 (calc.) 4.12 Flame Temperature: Currently not available 4.13 Combustion Molar Ratio (Reactant to Product): 14.5 (calc.) 4.14 Minimum Oxygen Concentration for Combustion (MOCC): Not listed | 7. SHIPPING INFORMATION 7.1 Grades of Purity: 85-99% 7.2 Storage Temperature: Ambient 7.3 Inert Atmosphere: No requirement 7.4 Venting: Open 7.5 IMO Pollution Category: D 7.6 Ship Type: 3 7.7 Barge Hull Type: 3 | | | | | | | | |
| 5. CHEMICAL REACTIVITY 5.1 Reactivity with Water: No reaction 5.2 Reactivity with Common Materials: No reaction 5.3 Stability During Transport: Stable 5.4 Neutralizing Agents for Acids and Caustics: Dilute with water 5.5 Polymerization: Not pertinent 5.6 Inhibitor of Polymerization: Not pertinent | 8. HAZARD CLASSIFICATIONS 8.1 49 CFR Category: Not listed 8.2 49 CFR Class: Not pertinent 8.3 49 CFR Package Group: Not listed. 8.4 Marine Pollutant: No 8.5 NFPA Hazard Classification: <table border="1"> <tr> <td>Category</td> <td>Classification</td> </tr> <tr> <td>Health Hazard (Blue).....</td> <td>1 2</td> </tr> <tr> <td>Flammability (Red).....</td> <td>1 1</td> </tr> <tr> <td>Instability (Yellow).....</td> <td>1 1</td> </tr> </table> 8.6 EPA Reportable Quantity: Not listed. 8.7 EPA Pollution Category: Not listed. 8.8 RCRA Waste Number: Not listed 8.9 EPA FWPCA List: Not listed | Category | Classification | Health Hazard (Blue)..... | 1 2 | Flammability (Red)..... | 1 1 | Instability (Yellow)..... | 1 1 |
| Category | Classification | | | | | | | | |
| Health Hazard (Blue)..... | 1 2 | | | | | | | | |
| Flammability (Red)..... | 1 1 | | | | | | | | |
| Instability (Yellow)..... | 1 1 | | | | | | | | |
| 6. WATER POLLUTION 6.1 Aquatic Toxicity: >100 ppm/48 hr/shrimp/LC ₅₀ /salt water 6.2 Waterfowl Toxicity: Currently not available 6.3 Biological Oxygen Demand (BOD): 1%, 5 days; 0%, 5 days; 6.2% (theor.), 20 days 6.4 Food Chain Concentration Potential: None 6.5 GESAMP Hazard Profile: Bioaccumulation: 0 Damage to living resources: 1 Human Oral hazard: 0 Human Contact hazard: 1 Reduction of amenities: 0 | 9. PHYSICAL & CHEMICAL PROPERTIES 9.1 Physical State at 15° C and 1 atm: Liquid 9.2 Molecular Weight: 149.19 9.3 Boiling Point at 1 atm: Decomposes 9.4 Freezing Point: 70.9°F = 21.6°C = 294.8°K 9.5 Critical Temperature: Not pertinent 9.6 Critical Pressure: Not pertinent 9.7 Specific Gravity: 1.13 at 20°C (liquid) 9.8 Liquid Surface Tension: Not pertinent 9.9 Liquid Water Interfacial Tension: Not pertinent 9.10 Vapor (Gas) Specific Gravity: Not pertinent 9.11 Ratio of Specific Heats of Vapor (Gas): 1.036 9.12 Latent Heat of Vaporization: 176 Btu/lb = 97.8 cal/g = 4.10 X 10 ⁵ J/kg 9.13 Heat of Combustion: -11,050 Btu/lb = -6140 cal/g = -257 X 10 ⁵ J/kg 9.14 Heat of Decomposition: Not pertinent 9.15 Heat of Solution: (est.) -20 Btu/lb = -12 cal/g = -0.5 X 10 ⁵ J/kg 9.16 Heat of Polymerization: Not pertinent 9.17 Heat of Fusion: Currently not available 9.18 Limiting Value: Currently not available 9.19 Reid Vapor Pressure: Low | | | | | | | | |
| NOTES | | | | | | | | | |

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| 9.20 SATURATED LIQUID DENSITY | | 9.21 LIQUID HEAT CAPACITY | | 9.22 LIQUID THERMAL CONDUCTIVITY | | 9.23 LIQUID VISCOSITY | |
|----------------------------------|-----------------------|------------------------------|-------------------------------------|-------------------------------------|-----------------------------------------------------|----------------------------|------------|
| Temperature (degrees F) | Pounds per cubic foot | Temperature (degrees F) | British thermal unit per pound-F | Temperature (degrees F) | British thermal unit inch per hour-square foot-F | Temperature (degrees F) | Centipoise |
| 72 | 70.400 | 72 | 0.489 | | N | | N |
| 74 | 70.330 | 74 | 0.490 | | O | | O |
| 76 | 70.259 | 76 | 0.491 | | T | | T |
| 78 | 70.190 | 78 | 0.492 | | | | |
| 80 | 70.120 | 80 | 0.494 | | P | | P |
| 82 | 70.049 | 82 | 0.495 | | E | | E |
| 84 | 69.980 | 84 | 0.496 | | R | | R |
| 86 | 69.910 | 86 | 0.497 | | T | | T |
| 88 | 69.839 | | | | I | | I |
| 90 | 69.770 | | | | N | | N |
| 92 | 69.709 | | | | E | | E |
| 94 | 69.639 | | | | N | | N |
| 96 | 69.570 | | | | T | | T |
| 98 | 69.500 | | | | | | |
| 100 | 69.429 | | | | | | |
| 102 | 69.360 | | | | | | |
| 104 | 69.290 | | | | | | |

| 9.24 SOLUBILITY IN WATER | | 9.25 SATURATED VAPOR PRESSURE | | 9.26 SATURATED VAPOR DENSITY | | 9.27 IDEAL GAS HEAT CAPACITY | |
|-----------------------------|-----------------------------------|----------------------------------|------------------------|---------------------------------|-----------------------|---------------------------------|-------------------------------------|
| Temperature (degrees F) | Pounds per 100 pounds of water | Temperature (degrees F) | Pounds per square inch | Temperature (degrees F) | Pounds per cubic foot | Temperature (degrees F) | British thermal unit per pound-F |
| | M | 320 | 0.020 | 320 | 0.00035 | 0 | 0.352 |
| | I | 340 | 0.037 | 340 | 0.00063 | 25 | 0.362 |
| | S | 360 | 0.065 | 360 | 0.00110 | 50 | 0.372 |
| | C | 380 | 0.111 | 380 | 0.00184 | 75 | 0.382 |
| | I | 400 | 0.185 | 400 | 0.00300 | 100 | 0.392 |
| | B | 420 | 0.300 | 420 | 0.00474 | 125 | 0.402 |
| | L | 440 | 0.473 | 440 | 0.00731 | 150 | 0.412 |
| | E | 460 | 0.729 | 460 | 0.01101 | 175 | 0.421 |
| | | 480 | 1.098 | 480 | 0.01623 | 200 | 0.430 |
| | | 500 | 1.620 | 500 | 0.02346 | 225 | 0.439 |
| | | 520 | 2.347 | 520 | 0.03330 | 250 | 0.448 |
| | | 540 | 3.340 | 540 | 0.04644 | 275 | 0.457 |
| | | 560 | 4.677 | 560 | 0.06375 | 300 | 0.466 |
| | | 580 | 6.451 | 580 | 0.08623 | 325 | 0.474 |
| | | 600 | 8.770 | 600 | 0.11500 | 350 | 0.482 |
| | | 620 | 11.770 | 620 | 0.15150 | 375 | 0.490 |
| | | 640 | 15.590 | 640 | 0.19710 | 400 | 0.498 |
| | | 660 | 20.420 | 660 | 0.25350 | 425 | 0.506 |
| | | | | | | 450 | 0.514 |
| | | | | | | 475 | 0.521 |
| | | | | | | 500 | 0.528 |
| | | | | | | 525 | 0.535 |
| | | | | | | 550 | 0.542 |
| | | | | | | 575 | 0.549 |
| | | | | | | 600 | 0.556 |