

TRIETHYLENETETRAMINE

TET

CAUTIONARY RESPONSE INFORMATION

Common Synonyms N,N-bis-(2-Aminoethyl)ethylenediamine TETA Trien		Oily liquid	Light straw to amber	Ammonia odor
		Floats and mixes with water.		
<p>Keep people away. Avoid contact with liquid. Wear goggles, self-contained breathing apparatus, and rubber overclothing (including gloves). Call fire department. Notify local health and pollution control agencies. Protect water intakes.</p>				
Fire	Combustible. Extinguish with dry chemical, alcohol foam, or carbon dioxide. Water may be ineffective on fire.			
Exposure	CALL FOR MEDICAL AID. LIQUID Will burn 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. DO NOT INDUCE VOMITING.			
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.			

<p>1. CORRECTIVE RESPONSE ACTIONS</p> Dilute and disperse Stop discharge Contain Collection Systems: Skim Salvage waterfowl	<p>2. CHEMICAL DESIGNATIONS</p> 2.1 CG Compatibility Group: 7; Aliphatic amine 2.2 Formula: NH(CH ₂) ₂ NH(CH ₂) ₂ NH(CH ₂) ₂ NH ₂ 2.3 IMO/UN Designation: Not listed 2.4 DOT ID No.: 2259 2.5 CAS Registry No.: 112-24-3 2.6 NAERG Guide No.: 153 2.7 Standard Industrial Trade Classification: 51452
<p>3. HEALTH HAZARDS</p> 3.1 Personal Protective Equipment: Amine-type canister; goggles or face shield; rubber gloves. 3.2 Symptoms Following Exposure: Vapors from hot liquid can irritate eyes and upper respiratory system. Liquid burns eyes and skin. May cause sensitization of skin. 3.3 Treatment of Exposure: INHALATION: remove victim to fresh air. INGESTION: do NOT induce vomiting; give large quantities of water; give at least one ounce of vinegar in equal amount of water; get medical attention. SKIN: flush with plenty of water. EYES: flush with plenty of water for at least 15 min. and get medical attention. 3.4 TLV-TWA: Not listed. 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 (rat) 3.8 Toxicity by Inhalation: Currently not available. 3.9 Chronic Toxicity: May cause dermatitis, asthma and other allergic reactions in man 3.10 Vapor (Gas) Irritant Characteristics: Vapors cause moderate irritation such that personnel will find high concentrations unpleasant. The effect is temporary. 3.11 Liquid or Solid Characteristics: Causes smarting of the skin and first-degree burns on short exposure; may cause secondary burns on long exposure. 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	

<p>4. FIRE HAZARDS</p> 4.1 Flash Point: 290°F O.C. 275°F C.C. 4.2 Flammable Limits in Air: Currently not available 4.3 Fire Extinguishing Agents: Dry chemical, alcohol foam, carbon dioxide 4.4 Fire Extinguishing Agents Not to Be Used: Water or foam may cause frothing. 4.5 Special Hazards of Combustion Products: Not pertinent 4.6 Behavior in Fire: Not pertinent 4.7 Auto Ignition Temperature: 640°F 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: 69.0 (calc.) 4.12 Flame Temperature: Currently not available 4.13 Combustion Molar Ratio (Reactant to Product): 19.0 (calc.) 4.14 Minimum Oxygen Concentration for Combustion (MOCC): Not listed	<p>7. SHIPPING INFORMATION</p> 7.1 Grades of Purity: 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								
<p>5. CHEMICAL REACTIVITY</p> 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: After dilution with water, can be neutralized with acetic acid. 5.5 Polymerization: Not pertinent 5.6 Inhibitor of Polymerization: Not pertinent	<p>8. HAZARD CLASSIFICATIONS</p> 8.1 49 CFR Category: Corrosive material 8.2 49 CFR Class: 8 8.3 49 CFR Package Group: II 8.4 Marine Pollutant: No 8.5 NFPA Hazard Classification: <table border="0"> <tr> <td>Category</td> <td>Classification</td> </tr> <tr> <td>Health Hazard (Blue).....</td> <td>3</td> </tr> <tr> <td>Flammability (Red).....</td> <td>1</td> </tr> <tr> <td>Instability (Yellow).....</td> <td>0</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).....	3	Flammability (Red).....	1	Instability (Yellow).....	0
Category	Classification								
Health Hazard (Blue).....	3								
Flammability (Red).....	1								
Instability (Yellow).....	0								
<p>6. WATER POLLUTION</p> 6.1 Aquatic Toxicity: Currently not available 6.2 Waterfowl Toxicity: Currently not available 6.3 Biological Oxygen Demand (BOD): Currently not available 6.4 Food Chain Concentration Potential: None 6.5 GESAMP Hazard Profile: Bioaccumulation: 0 Damage to living resources: 1 Human Oral hazard: 1 Human Contact hazard: II Reduction of amenities: XXX	<p>9. PHYSICAL & CHEMICAL PROPERTIES</p> 9.1 Physical State at 15° C and 1 atm: Liquid 9.2 Molecular Weight: 146.24 9.3 Boiling Point at 1 atm: 531.3°F = 277.4°C = 550.6°K 9.4 Freezing Point: -31°F = -35°C = 238°K 9.5 Critical Temperature: 860.0°F = 460°C = 733.2°K 9.6 Critical Pressure: 470 psia = 32 atm = 3.2 MN/m ² 9.7 Specific Gravity: 0.982 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): 1.037 9.12 Latent Heat of Vaporization: Not pertinent 9.13 Heat of Combustion: (est.) -13,500 Btu/lb = -7,530 cal/g = -315 X 10 ⁵ J/kg 9.14 Heat of Decomposition: Not pertinent 9.15 Heat of Solution: (est.) -13 Btu/lb = -7 cal/g = -0.3 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								
<p>NOTES</p>									

TRIETHYLENETETRAMINE

TET

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
35	62.280	85	0.607		N O T P E R T I N E N T		N O T P E R T I N E N T
40	62.140	90	0.612				
45	62.000	95	0.617				
50	61.860	100	0.622				
55	61.720	105	0.627				
60	61.580	110	0.633				
65	61.440	115	0.638				
70	61.310	120	0.643				
75	61.170	125	0.648				
80	61.030	130	0.653				
85	60.890	135	0.658				
90	60.750	140	0.663				
95	60.610	145	0.669				
100	60.470	150	0.674				
105	60.340						
110	60.200						
115	60.060						
120	59.920						

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 I S C I B L E	300	0.241	300	0.00431	0	0.344
		320	0.391	320	0.00683	25	0.357
		340	0.614	340	0.01046	50	0.370
		360	0.938	360	0.01559	75	0.383
		380	1.395	380	0.02263	100	0.396
		400	2.025	400	0.03209	125	0.409
		420	2.876	420	0.04454	150	0.421
		440	4.003	440	0.06062	175	0.433
		460	5.471	460	0.08105	200	0.445
		480	7.352	480	0.10660	225	0.457
		500	9.727	500	0.13810	250	0.468
		520	12.690	520	0.17640	275	0.480
		540	16.330	540	0.22250	300	0.491
		560	20.750	560	0.27730	325	0.502
		580	26.080	580	0.34180	350	0.512
		600	32.430	600	0.41690	375	0.523
					400	0.533	
					425	0.543	
					450	0.553	
					475	0.563	
					500	0.572	
					525	0.581	
					550	0.590	
					575	0.599	
					600	0.608	