

DIETHANOLAMINE

DEA

CAUTIONARY RESPONSE INFORMATION

Common Synonyms		Oily liquid or solid crystals	Liquid is colorless; Solid is white	Slight dead fish or ammonia odor
DEA 2,2'-Dihydroxydiethyl amine Di(2-hydroxyethyl) amine Bis-(2-Hydroxyethyl)amine 2,2'-Iminodiethanol		Sinks 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. Wear goggles, self-contained breathing apparatus, and rubber overclothing (including gloves). Extinguish with dry chemical, alcohol foam, or carbon dioxide. Cool exposed containers with water.			
Exposure	CALL FOR MEDICAL AID. LIQUID Irritating to skin and eyes. 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 and have victim induce vomiting. IF SWALLOWED and victim is UNCONSCIOUS OR HAVING CONVULSIONS, do nothing except keep victim warm.			
Water Pollution	Dangerous to aquatic life in high concentrations. May be dangerous if it enters water intakes. Notify local health and wildlife officials. Notify operators of nearby water intakes.			

1. CORRECTIVE RESPONSE ACTIONS

Dilute and disperse
Stop discharge

2. CHEMICAL DESIGNATIONS

2.1 CG Compatibility Group: 8; Alkanolamine
2.2 Formula: (HOCH₂CH₂)₂NH
2.3 IMO/UN Designation: Not listed
2.4 DOT ID No.: Not listed
2.5 CAS Registry No.: 111-42-2
2.6 NAERG Guide No.: Not listed
2.7 Standard Industrial Trade Classification: 51461

3. HEALTH HAZARDS

- 3.1 **Personal Protective Equipment:** Full face mask or amine vapor mask only, if required; clean body-covering clothing, chemical goggles.
- 3.2 **Symptoms Following Exposure:** Irritation of eyes and skin. Breathing vapors may cause coughing, a smothering sensation, nausea, headache.
- 3.3 **Treatment of Exposure:** INHALATION: no problem likely. Get medical attention if ill effects develop. INGESTION: induce vomiting if large amounts are swallowed and call a physician. Treat symptomatically. No known antidote. EYES: flush with plenty of water for at least 15 min. and get medical attention promptly. SKIN: flush with plenty of water. Wash contaminated clothing before reuse.
- 3.4 TLV-TWA: 0.46 ppm
3.5 TLV-STEL: Not listed.
3.6 TLV-Ceiling: Not listed.
3.7 **Toxicity by Ingestion:** Grade 2; LD₅₀ = 0.5 to 5 g/kg (rat)
3.8 **Toxicity by Inhalation:** Currently not available.
3.9 **Chronic Toxicity:** Currently not available
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 and 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

4. FIRE HAZARDS

- 4.1 **Flash Point:** 305°F O.C.
4.2 **Flammable Limits in Air:** 1.6% (calc.)-9.8% (est.)
4.3 **Fire Extinguishing Agents:** Water, alcohol foam, carbon dioxide, dry chemical
4.4 **Fire Extinguishing Agents Not to Be Used:** Addition of water may cause frothing.
4.5 **Special Hazards of Combustion Products:** Irritating vapors are generated when heated.
4.6 **Behavior in Fire:** Not pertinent
4.7 **Auto Ignition Temperature:** 1224°F
4.8 **Electrical Hazards:** Not pertinent
4.9 **Burning Rate:** 0.74 mm/min.
4.10 **Adiabatic Flame Temperature:** Currently not available
4.11 **Stoichiometric Air to Fuel Ratio:** 32.1 (calc.)
4.12 **Flame Temperature:** Currently not available
4.13 **Combustion Molar Ratio (Reactant to Product):** 10.5 (calc.)
4.14 **Minimum Oxygen Concentration for Combustion (MOCC):** Not listed

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:** Flush with water
5.5 **Polymerization:** Not pertinent
5.6 **Inhibitor of Polymerization:** Not pertinent

6. WATER POLLUTION

- 6.1 **Aquatic Toxicity:** 2100 ppm/24 hr/sunfish, bluegill/TL_m/fresh water
6.2 **Waterfowl Toxicity:** Currently not available
6.3 **Biological Oxygen Demand (BOD):** 10% (theor.), 5 days
6.4 **Food Chain Concentration Potential:** None
6.5 **GESAMP Hazard Profile:**
Bioaccumulation: 0
Damage to living resources: 2
Human Oral hazard: 1
Human Contact hazard: II
Reduction of amenities: XX

7. SHIPPING INFORMATION

- 7.1 **Grades of Purity:** 85-99.5%
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

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:**
- | Category | Classification |
|----------------------|----------------|
| Health Hazard (Blue) | 1 |
| Flammability (Red) | 1 |
| Instability (Yellow) | 0 |
- 8.6 **EPA Reportable Quantity:** 100 pounds
8.7 **EPA Pollution Category:** B
8.8 **RCRA Waste Number:** Not listed
8.9 **EPA FWPCA List:** Not listed

9. PHYSICAL & CHEMICAL PROPERTIES

- 9.1 **Physical State at 15° C and 1 atm:** Solid
9.2 **Molecular Weight:** 105.14
9.3 **Boiling Point at 1 atm:** 515.1°F = 268.4°C = 541.6°K
9.4 **Freezing Point:** 82°F = 28°C = 301°K
9.5 **Critical Temperature:** 827.6°F = 442°C = 715.2°K
9.6 **Critical Pressure:** 470 psia = 32 atm = 3.2 MN/m²
9.7 **Specific Gravity:** 1.095 at 28°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):** 1.053
9.12 **Latent Heat of Vaporization:** 266 Btu/lb = 148 cal/g = 6.20 X 10⁵ J/kg
9.13 **Heat of Combustion:** -10,790 Btu/lb = -6000 cal/g = -.251 X 10⁵ J/kg
9.14 **Heat of Decomposition:** Not pertinent
9.15 **Heat of Solution:** (est.) -13 Btu/lb = -7 cal/g = -.03 X 10⁵ 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:** 0.97 psia

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
85	68.230	85	0.584		N		N
90	68.110	90	0.589		O		O
95	67.990	95	0.594		T		T
100	67.870	100	0.599				
105	67.750	105	0.604		P		P
110	67.639	110	0.609		E		E
115	67.520	115	0.614		R		R
120	67.400	120	0.619		T		T
125	67.280	125	0.624		I		I
130	67.169	130	0.629		N		N
135	67.049	135	0.634		E		E
140	66.929	140	0.639		N		N
145	66.809	145	0.644		T		T
150	66.690	150	0.649				
155	66.580						
160	66.459						
165	66.339						
170	66.219						
175	66.099						
180	65.990						
185	65.870						
190	65.750						
195	65.629						
200	65.509						
205	65.400						
210	65.280						

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	310	0.221	310	0.00281	0	0.345
	I	320	0.289	320	0.00363	25	0.355
	S	330	0.376	330	0.00466	50	0.364
	C	340	0.485	340	0.00594	75	0.373
	I	350	0.619	350	0.00749	100	0.382
	B	360	0.786	360	0.00939	125	0.391
	L	370	0.990	370	0.01169	150	0.400
	E	380	1.238	380	0.01444	175	0.408
		390	1.538	390	0.01773	200	0.416
		400	1.899	400	0.02164	225	0.424
		410	2.330	410	0.02624	250	0.431
		420	2.843	420	0.03165	275	0.438
		430	3.448	430	0.03796	300	0.445
		440	4.161	440	0.04530	325	0.452
		450	4.995	450	0.05378	350	0.458
		460	5.967	460	0.06354	375	0.465
		470	7.094	470	0.07474	400	0.471
		480	8.396	480	0.08751	425	0.476
		490	9.893	490	0.10200	450	0.482
		500	11.610	500	0.11850	475	0.487
		510	13.570	510	0.13700	500	0.492
		520	15.800	520	0.15790	525	0.496
		530	18.320	530	0.18130	550	0.501
		540	21.170	540	0.20740	575	0.505
		550	24.380	550	0.23650	600	0.509
		560	27.980	560	0.26880		