

DIISOPROPANOLAMINE

DIP

CAUTIONARY RESPONSE INFORMATION

Common Synonyms 2,2'-Dihydroxydiisopropylamine 1,1'-Iminodi-2-propanol		Liquid or solid crystals Liquid floats and mixes with water. Solid sinks and mixes in water.	Liquid is colorless Solid is white to light yellow	Dead fish or ammonia odor
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.				
Fire	Combustible. Wear goggles, self-contained breathing apparatus, and rubber overclothing (including gloves). 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 OR SOLID 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 and have victim induce vomiting. IF SWALLOWED and victim is UNCONSCIOUS OR HAVING CONVULSIONS, do nothing except keep victim warm.			
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.			

1. CORRECTIVE RESPONSE ACTIONS Dilute and disperse Stop discharge	2. CHEMICAL DESIGNATIONS 2.1 CG Compatibility Group: 8; Alkanolamine 2.2 Formula: $[\text{CH}_3\text{CH}(\text{OH})\text{CH}_2]_2\text{NH}$ 2.3 IMO/UN Designation: Not listed 2.4 DOT ID No.: Not listed 2.5 CAS Registry No.: 110-97-4 2.6 NAERG Guide No.: Not listed. 2.7 Standard Industrial Trade Classification: 51451
3. HEALTH HAZARDS 3.1 Personal Protective Equipment: Full face mask or amine vapor mask only if required; clean, body-covering clothing, rubber gloves, apron, boots and face shield. 3.2 Symptoms Following Exposure: Vapor concentrations too low to irritate unless exposure is prolonged. Liquid will burn eyes and skin. 3.3 Treatment of Exposure: INHALATION: if ill effects occur, remove person to fresh air and get medical help. INGESTION: if swallowed and patient is conscious and not convulsing, promptly give milk or water, then induce vomiting; get medical help. No specific antidote known. EYE AND SKIN: immediately flush with plenty of water for at least 15 min. For eyes, get medical help promptly. Remove and wash contaminated clothing before reuse. 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; $\text{LD}_{50} = 0.5$ 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:** 260°F O.C.
- 4.2 **Flammable Limits in Air:** 1.1% (calc.)-5.4% (est.)
- 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:** Not pertinent
- 4.6 **Behavior in Fire:** Not pertinent
- 4.7 **Auto Ignition Temperature:** 580°F (calc.)
- 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:** 51.2 (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

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:** Not pertinent
- 5.5 **Polymerization:** Not pertinent
- 5.6 **Inhibitor of Polymerization:** Not pertinent

6. WATER POLLUTION

- 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: 2
 Human Oral hazard: 0
 Human Contact hazard: I
 Reduction of amenities: X

7. SHIPPING INFORMATION

- 7.1 **Grades of Purity:** 97%
- 7.2 **Storage Temperature:** Ambient
- 7.3 **Inert Atmosphere:** No requirement
- 7.4 **Venting:** Open
- 7.5 **IMO Pollution Category:** C
- 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)	2
Flammability (Red)	1
Instability (Yellow)	0
- 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

9. PHYSICAL & CHEMICAL PROPERTIES

- 9.1 **Physical State at 15° C and 1 atm:** Liquid or solid
- 9.2 **Molecular Weight:** 133.19
- 9.3 **Boiling Point at 1 atm:** 479.7°F = 248.7°C = 521.9°K
- 9.4 **Freezing Point:** 108°F = 42°C = 315°K
- 9.5 **Critical Temperature:** 750.2°F = 399°C = 672.2°K
- 9.6 **Critical Pressure:** 529 psia = 36 atm = 3.6 MN/m²
- 9.7 **Specific Gravity:** 0.99 at 42°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):** Not pertinent
- 9.12 **Latent Heat of Vaporization:** 185 Btu/lb = 103 cal/g = 4.31×10^5 J/kg
- 9.13 **Heat of Combustion:** (est.) -12,300 Btu/lb = -6860 cal/g = -287×10^5 J/kg
- 9.14 **Heat of Decomposition:** Not pertinent
- 9.15 **Heat of Solution:** (est.) -13 Btu/lb = -7 cal/g = -0.3×10^5 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:** 0.0 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
110	61.780	117	0.525		N		N
115	61.660	118	0.525		O		O
120	61.530	119	0.525		T		T
125	61.410	120	0.525				
130	61.290	121	0.525		P		P
135	61.170	122	0.525		E		E
140	61.050	123	0.525		R		R
145	60.930	124	0.525		T		T
150	60.810	125	0.525		I		I
155	60.680	126	0.525		N		N
160	60.560	127	0.525		E		E
165	60.440	128	0.525		N		N
170	60.320	129	0.525		T		T
175	60.200	130	0.525				
180	60.080	131	0.525				
185	59.960	132	0.525				
190	59.840	133	0.525				
195	59.710	134	0.525				
200	59.590	135	0.525				
205	59.470	136	0.525				
210	59.350	137	0.525				
		138	0.525				
		139	0.525				

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	110	0.001	110	0.00001		N
	I	120	0.001	120	0.00002		O
	S	130	0.002	130	0.00003		T
	C	140	0.002	140	0.00005		
	I	150	0.004	150	0.00007		P
	B	160	0.005	160	0.00011		E
	L	170	0.008	170	0.00016		R
	E	180	0.012	180	0.00022		T
		190	0.017	190	0.00032		I
		200	0.023	200	0.00044		N
		210	0.033	210	0.00061		E
		220	0.046	220	0.00083		N
		230	0.063	230	0.00113		E
		240	0.085	240	0.00151		N
		250	0.115	250	0.00201		T
		260	0.154	260	0.00266		
		270	0.205	270	0.00348		
		280	0.270	280	0.00453		
		290	0.353	290	0.00585		
		300	0.459	300	0.00750		
		310	0.593	310	0.00956		
		320	0.760	320	0.01210		
		330	0.968	330	0.01522		
		340	1.227	340	0.01903		
		350	1.544	350	0.02367		
		360	1.934	360	0.02927		