CYCLOHEXYLAMINE

CHA

CAUTIONARY RESPONSE INFORMATION

Common Synonyms	Liquid	Colorless	Strong, fishy odor
Aminocyclohexane Hexahydroaniline	Floats and mixes with water.		

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

FLAMMABLE
Flashback along vapor trail may occur.
Vapor may explode if ignited in an enclosed area.
Wear goggles and self-contained breathing apparatus.
Extinguish with dry chemicals, foam, or carbon dioxide.
Cool exposed containers with water.

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 pollution control officials.
Notify operators of nearby water intakes.

1. CORRECTIVE RESPONSE ACTIONS

Dilute and disperse
Stop discharge
Contain
Collection Systems: Skim
Salvage waterfowl

2. CHEMICAL DESIGNATIONS

2.1 CG Compatibility Group: 7; Aliphatic amine
2.2 Formula: $(CH_2)_5CHNH_2$
2.3 IMO/UN Designation: Not listed
2.4 DOT ID No.: 2357
2.5 CAS Registry No.: 108-91-8
2.6 NAERG Guide No.: 132
2.7 Standard Industrial Trade Classification: 51453

3. HEALTH HAZARDS

3.1 Personal Protective Equipment: Rubber gloves, chemical goggles, approved Bureau of Mines respirator for organic vapors.
3.2 Symptoms Following Exposure: Cyclohexylamine is strongly caustic. Inhalation of vapors and contact of liquid with skin and eyes causes severe burns.
3.3 Treatment of Exposure: INGESTION: do NOT induce vomiting. EYES: flush with water for at least 15 min. and obtain immediate medical attention. SKIN: immediately remove contaminated clothing and flush skin with large amounts of water.
3.4 TLV-TWA: 10 ppm
3.5 TLV-STEL: Not listed.
3.6 TLV-Ceiling: Not listed.
3.7 Toxicity by Ingestion: Grade 3; LD_{50} = 50 to 500 mg/kg
3.8 Toxicity by Inhalation: Currently not available.
3.9 Chronic Toxicity: Produced cancer of the bladder in the rat.
3.10 Vapor (Gas) Irritant Characteristics: Vapor is moderately irritating such that personnel will not usually tolerate moderate or high vapor concentration.
3.11 Liquid or Solid Characteristics: Severe skin irritant. Causes second and third degree burns on short contact; very injurious to the eyes.
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: 90°F O.C.
4.2 Flammable Limits in Air: Currently not available
4.3 Fire Extinguishing Agents: Foam, carbon dioxide, dry chemical.
4.4 Fire Extinguishing Agents Not to Be Used: Not pertinent
4.5 Special Hazards of Combustion Products: Toxic fumes of NOx may be produced in fire.
4.6 Behavior in Fire: Not pertinent
4.7 Auto Ignition Temperature: 560°F
4.8 Electrical Hazards: Currently not available
4.9 Burning Rate: 5.0 mm/min
4.10 Adiabatic Flame Temperature: Currently not available
4.11 Stoichometric Air to Fuel Ratio: 48.8 (calc.)
4.12 Flame Temperature: Currently not available
4.13 Combustion Molar Ratio (Reactant to Product): 13.5 (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: 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: Not listed

7. SHIPPING INFORMATION

7.1 Grades of Purity: Currently not available
7.2 Storage Temperature: Currently not available
7.3 Inert Atmosphere: Currently not available
7.4 Venting: Currently not available
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: 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:

Category	Classification
Health Hazard (Blue).....	2
Flammability (Red).....	3
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
9.2 Molecular Weight: 99.18
9.3 Boiling Point at 1 atm: 274.1°F = 134.5°C = 407.7°K
9.4 Freezing Point: 0.1°F = –17.7°C = 255.5°K
9.5 Critical Temperature: 647.6°F = 342°C = 615.2°K
9.6 Critical Pressure: Not pertinent
9.7 Specific Gravity: 0.865 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: 3.42
9.11 Ratio of Specific Heats of Vapor (Gas): Not pertinent
9.12 Latent Heat of Vaporization: 158 Btu/lb = 87.6 cal/g = 3.67 X 10^5 J/kg
9.13 Heat of Combustion: (est.) –18,000 Btu/lb = –10,000 cal/g = –420 X 10^5 J/kg
9.14 Heat of Decomposition: Not pertinent
9.15 Heat of Solution: (est.) –4 Btu/lb = –2 cal/g = –0.1 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: Currently not available

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
40	54.860	85	0.483	77	0.880		N
50	54.550	90	0.491				O
60	54.230	95	0.499				T
70	53.910	100	0.507				
80	53.590	105	0.515				P
90	53.270	110	0.523				E
100	52.950	115	0.531				R
110	52.630	120	0.539				T
120	52.310	125	0.547				I
130	51.990	130	0.555				N
140	51.670	135	0.563				E
150	51.350	140	0.571				N
160	51.040	145	0.579				T
170	50.720	150	0.587				
180	50.400						
190	50.080						
200	49.760						
210	49.440						

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	70	0.177	70	0.00309		N
	I	80	0.238	80	0.00407		O
	S	90	0.316	90	0.00531		T
	C	100	0.415	100	0.00685		
	I	110	0.541	110	0.00877		P
	B	120	0.697	120	0.01112		E
	L	130	0.892	130	0.01398		R
	E	140	1.132	140	0.01744		T
		150	1.424	150	0.02159		I
		160	1.780	160	0.02653		N
		170	2.208	170	0.03240		E
		180	2.721	180	0.03930		N
		190	3.331	190	0.04737		T
		200	4.053	200	0.05677		
		210	4.903	210	0.06765		
		220	5.899	220	0.08019		
		230	7.058	230	0.09456		
		240	8.403	240	0.11100		
		250	9.954	250	0.12960		
		260	11.740	260	0.15070		
		270	13.780	270	0.17440		
		280	16.100	280	0.20110		