METHYLAMINE SOLUTION

MSZ

CAUTIONARY RESPONSE INFORMATION

Common Synonyms	Water solution	Colorless	Ammonia-like odor
Aminomethane Mercurialin Monomethylamine	Mixes with water.		

Keep people away.
Shut off ignition sources and call fire department.
Avoid contact with liquid.
Evacuate area in case of large discharge.
Notify local health and pollution control agencies.

Fire

FLAMMABLE
Poisonous gases may be produced in fire.
Container may explode in fire.
Flashback along vapor trail may occur.
Vapor may explode if ignited in an enclosed area.
Wear goggles and self-contained breathing apparatus.
Let fire burn; stop flow of gas if possible.
Cool exposed containers and protect men affecting shut off with water.
Extinguish small fires with dry chemical, CO_2, water spray or alcoholfoam and large fires with water spray, fog or alcohol foam.

Exposure

CALL FOR MEDICAL AID.

VAPOR
Irritating to eyes, nose and throat.
If inhaled, will causa coughing and difficult breathing.
Move victim to fresh air.
If breathing has stopped, give artificial respiration.
If breathing is difficult, give oxygen.

LIQUID
Will burn skin and eyes.
Remove contaminated clothing and shoes.
Wash affected area with soap and 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

HARMFUL TO AQUATIC LIFE IN VERY LOW 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: 7; Aliphatic amine
2.2 Formula: CH_3NH_2
2.3 IMO/UN Designation: 3.1/1235
2.4 DOT ID No.: 1235
2.5 CAS Registry No.: 74-89-5
2.6 NAERG Guide No.: 132
2.7 Standard Industrial Trade Classification: 51451

3. HEALTH HAZARDS

3.1 Personal Protective Equipment: Self-contained (positive pressure, if available) breathing apparatus and full protective clothing. No skin surface should be exposed.
3.2 Symptoms Following Exposure: INHALATION: Causes irritation of nose and throat, followed by violent sneezing, burning sensation in throat, coughing and difficulty in breathing, pulmonary congestion, edema of the lungs and conjunctivitis. Bronchitis occurred in a worker exposed to a workroom concentration range of 2-60 ppm. EYES: Liquid contact causes burning (severe exposure may cause blindness). SKIN: Causes burning. Vapors may cause dermatitis. INGESTION: Causes burns of the mouth, throat and esophagus.
3.3 Treatment of Exposure: INHALATION: Remove victim to fresh air at once. If breathing is difficult, give oxygen. If breathing has stopped, give artificial respiration. Get medical attention. EYES: Flush with water for at least 15 minutes. Physician should examine eyes if irritation or pain persists after 15 minutes. SKIN: Exposed area should be washed twice with soap and water. Physician should examine exposed area if pain or irritation persist after area is washed. INGESTION: Do not induce vomiting or perform gastric lavage. Do not attempt to neutralize. Dilute with water or milk in copious amounts.
3.4 TLV-TWA: 5 ppm
3.5 TLV-STEL: Not listed.
3.6 TLV-Ceiling: 15 ppm
3.7 Toxicity by Ingestion: Grade 3; LD_{50} = 100-200 mg/kg (rat)
3.8 Toxicity by Inhalation: Currently not available.
3.9 Chronic Toxicity: Currently not available
3.10 Vapor (Gas) Irritant Characteristics: Vapors are moderately irritating such that personnel will not usually tolerate moderate or high concentrations.
3.11 Liquid or Solid Characteristics: Causes smarting of the skin and first degree burns on short exposure and may cause second degree burns on long exposure.
3.12 Odor Threshold: 0.021 ppm
3.13 IDLH Value: 100 ppm
3.14 OSHA PEL-TWA: 10 ppm
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: 32°F C.C.
4.2 Flammable Limits in Air: 4.3%-21%
4.3 Fire Extinguishing Agents: Small fires: Dry chemical, CO_2, water spray or alcohol foam. Large fires: Water spray, fog or alcohol foam.
4.4 Fire Extinguishing Agents Not to Be Used: Not pertinent
4.5 Special Hazards of Combustion Products: Toxic nitrogen oxides may be formed.
4.6 Behavior in Fire: Vapors are heavier than air and may travel a considerable distance to a source of ignition and flashback. When heated to decomposition, it emits toxic fumes of NO_x
4.7 Auto Ignition Temperature: 806°F
4.8 Electrical Hazards: Currently not available
4.9 Burning Rate: Not pertinent
4.10 Adiabatic Flame Temperature: Currently not available
4.11 Stoichometric Air to Fuel Ratio: 15.5 (calc.)
4.12 Flame Temperature: Currently not available
4.13 Combustion Molar Ratio (Reactant to Product): 4.5 (calc.)
4.14 Minimum Oxygen Concentration for Combustion (MOCC): Not listed

5. CHEMICAL REACTIVITY

5.1 Reactivity with Water: Dissolves completely.
5.2 Reactivity with Common Materials: Corrosive to copper, copper alloys, zinc alloys, aluminum and galvanized surfaces. Contact with mercury can produce explosive reaction.
5.3 Stability During Transport: Stable.
5.4 Neutralizing Agents for Acids and Caustics: Mild acidic solution such as vinegar or 1-2% acetic acid.
5.5 Polymerization: Not pertinent
5.6 Inhibitor of Polymerization: Not pertinent

6. WATER POLLUTION

6.1 Aquatic Toxicity: 10 - 30 ppm/24 hr/creek chub
6.2 Waterfowl Toxicity: Currently not available
6.3 Biological Oxygen Demand (BOD): 67.8% in 13 days
6.4 Food Chain Concentration Potential: None
6.5 GESAMP Hazard Profile:
Bioaccumulation: 0
Damage to living resources: 2
Human Oral hazard: 2
Human Contact hazard: II
Reduction of amenities: XXX

7. SHIPPING INFORMATION

7.1 Grades of Purity: Anhydrous 99.3+%; water solutions 30-50% by weight
7.2 Storage Temperature: Ambient
7.3 Inert Atmosphere: No requirement
7.4 Venting: Safety relief
7.5 IMO Pollution Category: C
7.6 Ship Type: 2
7.7 Barge Hull Type: 2

8. HAZARD CLASSIFICATIONS

8.1 49 CFR Category: Flammable liquid
8.2 49 CFR Class: 3
8.3 49 CFR Package Group: II
8.4 Marine Pollutant: No
8.5 NFPA Hazard Classification:

Category	Classification
Health Hazard (Blue).....	3
Flammability (Red).....	4
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 solution
9.2 Molecular Weight: 31.06
9.3 Boiling Point at 1 atm: 20.66°F = –6.3°C = 266.7°K
9.4 Freezing Point: –134.5°F = –92.5°C = 180.5°K
9.5 Critical Temperature: 314.4°F = 156.9°C = 430.1°K
9.6 Critical Pressure: 590 psia = 40.2 atm = 4.07 MN/m^2
9.7 Specific Gravity: 0.693 at -6.5°C
9.8 Liquid Surface Tension: 29.2 dynes/cm at -70°C
9.9 Liquid Water Interfacial Tension: Currently not available
9.10 Vapor (Gas) Specific Gravity: 1.1
9.11 Ratio of Specific Heats of Vapor (Gas): 1.1946
9.12 Latent Heat of Vaporization: 374.90 Btu/lb = 208.29 cal/g = $8.72X10^5$ J/kg
9.13 Heat of Combustion: –15,000 Btu/lb = –8,340 cal/g = –34.9 X 10^6 J/kg
9.14 Heat of Decomposition: Not pertinent
9.15 Heat of Solution: Currently not available
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

METHYLAMINE SOLUTION

MSZ

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
	CURRENTLY NOT AVAILABLE		CURRENTLY NOT AVAILABLE		CURRENTLY NOT AVAILABLE	32	0.236

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
	MISCIBLE		CURRENTLY NOT AVAILABLE		CURRENTLY NOT AVAILABLE		CURRENTLY NOT AVAILABLE