

METHYL MERCAPTAN

MMC

CAUTIONARY RESPONSE INFORMATION

Common Synonyms	Mercaptomethane Methaneethiol Methyl sulfhydride Thiomethyl alcohol	Liquefied compressed gas Colorless Strong garlic odor Floats and boils on water. Poisonous, flammable vapor is produced.
KEEP PEOPLE AWAY. AVOID CONTACT WITH LIQUID AND VAPOR. Wear goggles, self-contained breathing apparatus, and rubber overclothing (including gloves). Shut off ignition sources. Call fire department. Evacuate area in case of large discharge. Notify local health and pollution control agencies.		
Fire	FLAMMABLE. POISONOUS GASES ARE PRODUCED IN FIRE. Containers 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 effecting shutoff with water.	
Exposure	CALL FOR MEDICAL AID. VAPOR POISONOUS IF INHALED. Irritating to eyes, nose and throat. Move victim to fresh air. If in eyes, hold eyelids open and flush with plenty of water. If breathing has stopped, give artificial respiration. If breathing is difficult, give oxygen. LIQUID POISONOUS IF SWALLOWED. 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	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	2. CHEMICAL DESIGNATIONS
Dilute and disperse Stop discharge Chemical and Physical Treatment: Burn	2.1 CG Compatibility Group: Not listed. 2.2 Formula: CH ₃ SH 2.3 IMO/UN Designation: 2/1064 2.4 DOT ID No.: 1064 2.5 CAS Registry No.: 74-93-1 2.6 NAERG Guide No.: 117 2.7 Standard Industrial Trade Classification: 51549
3. HEALTH HAZARDS	
3.1 Personal Protective Equipment: Rubber gloves; goggles or face shield; air-line or self-contained breathing apparatus. 3.2 Symptoms Following Exposure: Inhalation causes irritation of respiratory system, tremors, paralysis, unconsciousness; death may follow respiratory paralysis. Contact with liquid irritates eyes and skin. Ingestion causes irritation of mouth and stomach plus symptoms described for inhalation. 3.3 Treatment of Exposure: INHALATION: remove patient immediately from the contaminated area; keep him warm and at complete rest; if necessary give artificial respiration until medical assistance can be obtained; oxygen or oxygen-CO ₂ inhalation is recommended, continuing after spontaneous breathing has returned. EYES: for exposure to vapor, apply hot and cold compresses to reduce pain of conjunctivitis; for exposure to liquid, wash with water and obtain medical assistance. SKIN: wash with water. INGESTION: induce vomiting and follow with gastric lavage. 3.4 TLV-TWA: 0.5 ppm 3.5 TLV-STEL: Not listed. 3.6 TLV-Ceiling: Not listed. 3.7 Toxicity by Ingestion: Currently not available 3.8 Toxicity by Inhalation: Currently not available. 3.9 Chronic Toxicity: Currently not available 3.10 Vapor (Gas) Irritant Characteristics: Currently not available 3.11 Liquid or Solid Characteristics: Currently not available 3.12 Odor Threshold: 0.0021 ppm 3.13 IDLH Value: 150 ppm 3.14 OSHA PEL-TWA: Not listed. 3.15 OSHA PEL-STEL: Not listed. 3.16 OSHA PEL-Ceiling: 10 ppm 3.17 EPA AEGL: Not listed	

4. FIRE HAZARDS

- 4.1 **Flash Point:** Not pertinent (flammable, liquefied compressed gas)
 4.2 **Flammable Limits in Air:** 3.9%-21.8%
 4.3 **Fire Extinguishing Agents:** Preferably let fire burn, stop gas flow. Fires may be extinguished with dry chemical, foam, or carbon dioxide.
 4.4 **Fire Extinguishing Agents Not to Be Used:** Water may be ineffective.
 4.5 **Special Hazards of Combustion Products:** Irritating sulfur dioxide is produced.
 4.6 **Behavior in Fire:** Containers may explode.
 4.7 **Auto Ignition Temperature:** Currently not available
 4.8 **Electrical Hazards:** Currently not available
 4.9 **Burning Rate:** 3.8 mm/min.
 4.10 **Adiabatic Flame Temperature:** Currently not available
 4.11 **Stoichiometric Air to Fuel Ratio:** 14.3 (calc.)
 4.12 **Flame Temperature:** Currently not available
 4.13 **Combustion Molar Ratio (Reactant to Product):** 4.0 (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:** 1.0 ppm/105 min/white bass/death/fresh water
 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: (T)
 Damage to living resources: 4
 Human Oral hazard: (2)
 Human Contact hazard: II
 Reduction of amenities: XXX

7. SHIPPING INFORMATION

- 7.1 **Grades of Purity:** 99.5+%
- 7.2 **Storage Temperature:** Ambient
 7.3 **Inert Atmosphere:** No requirement
 7.4 **Venting:** Safety relief
 7.5 **IMO Pollution Category:** Currently not available
 7.6 **Ship Type:** Currently not available
 7.7 **Barge Hull Type:** Currently not available

8. HAZARD CLASSIFICATIONS

- 8.1 **49 CFR Category:** Poison gas
 8.2 **49 CFR Class:** 2.3
 8.3 **49 CFR Package Group:** Not pertinent
 8.4 **Marine Pollutant:** Yes
 8.5 **NFPA Hazard Classification:**
- | | |
|---------------------------|----------------|
| Category | Classification |
| Health Hazard (Blue)..... | 2 |
| Flammability (Red)..... | 4 |
| Instability (Yellow)..... | 0 |
- 8.6 **EPA Reportable Quantity:** 100 pounds
 8.7 **EPA Pollution Category:** B
 8.8 **RCRA Waste Number:** U153
 8.9 **EPA FWCRA List:** Yes

9. PHYSICAL & CHEMICAL PROPERTIES

- 9.1 **Physical State at 15°C and 1 atm:** Gas
 9.2 **Molecular Weight:** 48.1
 9.3 **Boiling Point at 1 atm:** 43.2°F = 6.2°C = 279.4°K
 9.4 **Freezing Point:** -189°F = 123°C = 150°K
 9.5 **Critical Temperature:** 386.2°F = 196.8°C = 470°K
 9.6 **Critical Pressure:** 1,050 psia = 71.4 atm = 7.25 MN/m²
 9.7 **Specific Gravity:** 0.892 at 6°C (liquid)
 9.8 **Liquid Surface Tension:** 31 dynes/cm = 0.031 N/m at 5°C
 9.9 **Liquid Water Interfacial Tension:** Not pertinent
 9.10 **Vapor (Gas) Specific Gravity:** 1.66
 9.11 **Ratio of Specific Heats of Vapor (Gas):** 1.1988
 9.12 **Latent Heat of Vaporization:** 220 Btu/lb = 122 cal/g = 5.10 X 10⁵ J/kg
 9.13 **Heat of Combustion:** -11,054 Btu/lb = -6,141 cal/g = -257.0 X 10⁵ J/kg
 9.14 **Heat of Decomposition:** Not pertinent
 9.15 **Heat of Solution:** Not pertinent
 9.16 **Heat of Polymerization:** Not pertinent
 9.17 **Heat of Fusion:** 29.35 cal/g
 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
0	57.730	0	0.436	0	1.282	-35	0.255
5	57.490	5	0.436	5	1.265	-30	0.250
10	57.250	10	0.437	10	1.249	-25	0.245
15	57.010	15	0.438	15	1.233	-20	0.241
20	56.760	20	0.438	20	1.216	-15	0.237
25	56.520	25	0.439	25	1.200	-10	0.232
30	56.280	30	0.440	30	1.184	-5	0.229
35	56.030	35	0.440	35	1.167	0	0.225
40	55.791	40	0.441	40	1.151	5	0.221
						10	0.218
						15	0.214
						20	0.211
						25	0.208
						30	0.205
						35	0.202
						40	0.199

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
59	2.400	-35	1.655	-35	0.01746	0	0.233
		30	1.947	30	0.02031	25	0.238
		-25	2.283	-25	0.02354	50	0.244
		-20	2.667	-20	0.02718	75	0.250
		-15	3.105	-15	0.03129	100	0.255
		-10	3.602	-10	0.03590	125	0.261
		-5	4.166	-5	0.04105	150	0.266
		0	4.802	0	0.04681	175	0.272
		5	5.519	5	0.05322	200	0.277
		10	6.323	10	0.06033	225	0.283
		15	7.225	15	0.06820	250	0.289
		20	8.232	20	0.07690	275	0.294
		25	9.354	25	0.08648	300	0.300
		30	10.600	30	0.09701	325	0.305
		35	11.980	35	0.10860	350	0.311
		40	13.520	40	0.12120	375	0.316
		45	15.210	45	0.13500	400	0.322
		50	17.070	50	0.15000	425	0.328
		55	19.110	55	0.16640	450	0.333
		60	21.360	60	0.18420	475	0.339
		65	23.820	65	0.20340	500	0.344
						525	0.350
						550	0.355
						575	0.361
						600	0.367