METHYL ALCOHOL

MAL

CAUTIONARY RESPONSE INFORMATION

Common Synonyms
Colonial spirit
Columbian spirit
Methanol
Pyroxylic spirit
Wood alcohol
Wood spirit

Watery liquid Colorless Alcohol odor

Floats and mixes with water. Flammable, irritating vapor is produced.

Keep people away.
Shut off ignition sources and call fire department.
Stay upwind and use water spray to ``knock down'' vapor.
Avoid contact with liquid and vapor.
Notify local health and pollution control agencies.

Fire

FLAMMABLE.
Vapor may explode if ignited in an enclosed area.
Flashback along vapor trail may occur.
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.

VAPOR
Irritating to eyes, nose and throat.
If inhaled, will cause dizziness, headache, difficult breathing, or loss of consciousness.
Move to fresh air.
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

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: 20; Alcohol, glycol
2.2 Formula: CH_3OH
2.3 IMO/UN Designation: 3.2/1230
2.4 DOT ID No.: 1230
2.5 CAS Registry No.: 67-56-1
2.6 NAERG Guide No.: 131
2.7 Standard Industrial Trade Classification: 51211

3. HEALTH HAZARDS

3.1 Personal Protective Equipment: Approved canister mask for high vapor concentrations; safety goggles; rubber gloves.
3.2 Symptoms Following Exposure: Exposure to excessive vapor causes eye irritation, head- ache, fatigue and drowsiness. High concentrations can produce central nervous system depression and optic nerve damage. 50,000 ppm will probably cause death in 1 to 2 hrs. Can be absorbed through skin. Swallowing may cause death or eye damage.
3.3 Treatment of Exposure: Remove victim from exposure and apply artifical respiration if breathing has ceased. INGESTION: induce vomiting, then give 2 teaspoons of baking soda in glass of water; call a physician. SKIN OR EYES: flush with water for 15 min.
3.4 TLV-TWA: 200 ppm
3.5 TLV-STEL: Not listed.
3.6 TLV-Ceiling: 250 ppm
3.7 Toxicity by Ingestion: Grade 1; LD_{50} = 5 to 15 g/kg (rat)
3.8 Toxicity by Inhalation: Currently not available.
3.9 Chronic Toxicity: None
3.10 Vapor (Gas) Irritant Characteristics: Vapors cause a slight smarting of the eyes or respiratory system if present in high concentrations. The effect is temporary.
3.11 Liquid or Solid Characteristics: Minimum hazard. If spilled on clothing and allowed to remain, may cause smarting and reddening of the skin.
3.12 Odor Threshold: 100 ppm
3.13 IDLH Value: 6,000 ppm
3.14 OSHA PEL-TWA: 200 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: 61°F O.C. 54°F C.C.
4.2 Flammable Limits in Air: 6.0%-36.5%
4.3 Fire Extinguishing Agents: Alcohol foam, dry chemical, or carbon dioxide
4.4 Fire Extinguishing Agents Not to Be Used: Water may be ineffective.
4.5 Special Hazards of Combustion Products: Not pertinent
4.6 Behavior in Fire: Containers may explode.
4.7 Auto Ignition Temperature: 867°F
4.8 Electrical Hazards: Class I, Group D
4.9 Burning Rate: 1.7 mm/min.
4.10 Adiabatic Flame Temperature: Currently not available
4.11 Stoichometric Air to Fuel Ratio: 7.1 (calc.)
4.12 Flame Temperature: Currently not available
4.13 Combustion Molar Ratio (Reactant to Product): 3.0 (calc.)
4.14 Minimum Oxygen Concentration for Combustion (MOCC): N_2 diluent: 9.7-10.0%; CO_2 diluent: 12.0%

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: 250 ppm/11 hr/goldfish/died/fresh water
6.2 Waterfowl Toxicity: Currently not available
6.3 Biological Oxygen Demand (BOD): 0.6 to 1.12 lb/lb in 5 days
6.4 Food Chain Concentration Potential: None
6.5 GESAMP Hazard Profile:
Bioaccumulation: 0
Damage to living resources: 0
Human Oral hazard: 3
Human Contact hazard: II
Reduction of amenities: XX

7. SHIPPING INFORMATION

7.1 Grades of Purity: CP, Crude, ACS: all 99.9%
7.2 Storage Temperature: Ambient
7.3 Inert Atmosphere: No requirement
7.4 Venting: Open (flame arrester) or pressure-vacuum
7.5 IMO Pollution Category: D
7.6 Ship Type: Data not avaialable
7.7 Barge Hull Type: Currently not available

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).....	1
Flammability (Red).....	3
Instability (Yellow).....	0

8.6 EPA Reportable Quantity: 5000 pounds
8.7 EPA Pollution Category: D
8.8 RCRA Waste Number: U154
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: 32.04
9.3 Boiling Point at 1 atm: 148.1°F = 64.5°C = 337.7°K
9.4 Freezing Point: –144.0°F = –97.8°C = 175.4°K
9.5 Critical Temperature: 464.0°F = 240°C = 513.2°K
9.6 Critical Pressure: 1142.0 psia = 77.7 atm = 7.87 MN/m^2
9.7 Specific Gravity: 0.792 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: 1.1
9.11 Ratio of Specific Heats of Vapor (Gas): 1.254
9.12 Latent Heat of Vaporization: 473.0 Btu/lb = 262.8 cal/g = 11.00 X 10^5 J/kg
9.13 Heat of Combustion: –8419 Btu/lb = –4677 cal/g = –195.8 X 10^5 J/kg
9.14 Heat of Decomposition: Not pertinent
9.15 Heat of Solution: (est.) –9 Btu/lb = –5 cal/g = –0.2 X 10^5 J/kg
9.16 Heat of Polymerization: Not pertinent
9.17 Heat of Fusion: 23.70 cal/g
9.18 Limiting Value: Currently not available
9.19 Reid Vapor Pressure: 4.5 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
15	51.110	60	0.576	65	1.389		N
20	50.950	70	0.593	70	1.384		O
25	50.790	80	0.611	75	1.379		T
30	50.630	90	0.629	80	1.374		
35	50.470	100	0.647	85	1.369		P
40	50.310	110	0.665	90	1.364		E
45	50.150	120	0.682	95	1.360		R
50	49.990	130	0.700	100	1.355		T
55	49.830	140	0.718	105	1.350		I
60	49.670			110	1.345		N
65	49.510			115	1.340		E
70	49.350			120	1.335		N
75	49.190			125	1.330		T
80	49.030			130	1.325		
85	48.870						
90	48.710						
95	48.550						
100	48.390						

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	20	0.377	20	0.00235	0	0.280
	I	30	0.537	30	0.00327	25	0.289
	S	40	0.753	40	0.00450	50	0.299
	C	50	1.044	50	0.00611	75	0.309
	I	60	1.428	60	0.00820	100	0.319
	B	70	1.930	70	0.01087	125	0.328
	L	80	2.579	80	0.01427	150	0.338
	E	90	3.412	90	0.01852	175	0.348
		100	4.467	100	0.02383	200	0.359
		110	5.795	110	0.03036	225	0.369
		120	7.450	120	0.03836	250	0.379
		130	9.496	130	0.04807	275	0.390
		140	12.010	140	0.05976	300	0.400
		150	15.070	150	0.07376	325	0.411
		160	18.770	160	0.09039	350	0.422
		170	23.210	170	0.11000	375	0.432
						400	0.443
						425	0.454
						450	0.466
						475	0.477
						500	0.488
						525	0.500
						550	0.511
						575	0.523
						600	0.534