METHYL ETHYL KETONE

MEK

CAUTIONARY RESPONSE INFORMATION

Common Synonyms	Liquid	Colorless	Sweet odor
2-Butanone Ethyl methyl ketone MEK	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.
Flashback along vapor trail may occur.
Vapor may explode if ignited in an enclosed area.
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 nausea, vomiting, headache, dizziness, difficult breathing, or loss of consciousness.
Move to fresh air.
If breathing has stopped, give artificial respiration.
If breathing is difficult, give oxygen.

LIQUID
Will burn 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.

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: 18; Ketone
2.2 Formula: $CH_3COCH_2CH_3$
2.3 IMO/UN Designation: 3.2/1193
2.4 DOT ID No.: 1193
2.5 CAS Registry No.: 78-93-3
2.6 NAERG Guide No.: 127
2.7 Standard Industrial Trade Classification: 51625

3. HEALTH HAZARDS

3.1 Personal Protective Equipment: Organic canister or air pack; plastic gloves; goggles or face shield.
3.2 Symptoms Following Exposure: Liquid causes eye burn. Vapor irritates eyes, nose, and throat; can cause headache, dizziness, nausea, weakness, and loss of consciousness.
3.3 Treatment of Exposure: INHALATION: remove victim to fresh air; if breathing is irregular or has stopped, start resuscitation and administer oxygen. EYES: wash with plenty of water for at least 15 min. and call physician.
3.4 TLV-TWA: 200 ppm
3.5 TLV-STEL: 300 ppm
3.6 TLV-Ceiling: Not listed.
3.7 Toxicity by Ingestion: Grade 2; LD_{50} = 0.5 to 5 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: 10 ppm
3.13 IDLH Value: 3,000 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: 22°F O.C. 20°F C.C.
4.2 Flammable Limits in Air: 1.8%-11.5%
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: Not pertinent
4.7 Auto Ignition Temperature: 961°F
4.8 Electrical Hazards: Class I, Group D
4.9 Burning Rate: 4.1 mm/min.
4.10 Adiabatic Flame Temperature: Currently not available
4.11 Stoichometric Air to Fuel Ratio: 26.2 (calc.)
4.12 Flame Temperature: Currently not available
4.13 Combustion Molar Ratio (Reactant to Product): 8.0 (calc.)
4.14 Minimum Oxygen Concentration for Combustion (MOCC): N_2 diluent: 11.0-11.4%; CO_2 diluent: 13.5%

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: 5640 mg/l/48 hr/bluegill/TL_m/fresh water
6.2 Waterfowl Toxicity: Currently not available
6.3 Biological Oxygen Demand (BOD): 214%, 5 days
6.4 Food Chain Concentration Potential: None
6.5 GESAMP Hazard Profile:
Bioaccumulation: 0
Damage to living resources: 0
Human Oral hazard: 1
Human Contact hazard: I
Reduction of amenities: X

7. SHIPPING INFORMATION

7.1 Grades of Purity: 99.5+%
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: 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: 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: U159/D035
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: 72.11
9.3 Boiling Point at 1 atm: 175.3°F = 79.6°C = 352.8°K
9.4 Freezing Point: –123.3°F = –86.3°C = 186.9°K
9.5 Critical Temperature: 504.5°F = 262.5°C = 535.7°K
9.6 Critical Pressure: 603 psia = 41.0 atm = 4.15 MN/m^2
9.7 Specific Gravity: 0.806 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: 2.5
9.11 Ratio of Specific Heats of Vapor (Gas): 1.075
9.12 Latent Heat of Vaporization: 191 Btu/lb = 106 cal/g = 4.44 X 10^5 J/kg
9.13 Heat of Combustion: –13,480 Btu/lb = –7491 cal/g = –313.6 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: Currently not available
9.18 Limiting Value: Currently not available
9.19 Reid Vapor Pressure: 3.5 psia

NOTES

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9.20 SATURATED LIQUID DENSITY	
Temperature (degrees F)	Pounds per cubic foot
35	51.460
40	51.280
45	51.110
50	50.940
55	50.760
60	50.590
65	50.420
70	50.240
75	50.070
80	49.900
85	49.720
90	49.550
95	49.380
100	49.200
105	49.030
110	48.860
115	48.680
120	48.510

9.21 LIQUID HEAT CAPACITY	
Temperature (degrees F)	British thermal unit per pound-F
-35	0.501
-30	0.502
-25	0.503
-20	0.504
-15	0.505
-10	0.507
-5	0.508
0	0.509
5	0.510
10	0.511
15	0.512
20	0.513
25	0.514
30	0.516
35	0.517
40	0.518
45	0.519
50	0.520
55	0.521
60	0.522
65	0.523
70	0.524
75	0.526
80	0.527
85	0.528
90	0.529

9.22 LIQUID THERMAL CONDUCTIVITY	
Temperature (degrees F)	British thermal unit inch per hour-square foot-F
10	1.073
15	1.068
20	1.063
25	1.058
30	1.053
35	1.048
40	1.043
45	1.038
50	1.033
55	1.028
60	1.023
65	1.018
70	1.013
75	1.008
80	1.003
85	0.998
90	0.993
95	0.988
100	0.983
105	0.978

9.23 LIQUID VISCOSITY	
Temperature (degrees F)	Centipoise
	N
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9.24 SOLUBILITY IN WATER	
Temperature (degrees F)	Pounds per 100 pounds of water
68	27.000

9.25 SATURATED VAPOR PRESSURE	
Temperature (degrees F)	Pounds per square inch
0	0.148
10	0.216
20	0.310
30	0.437
40	0.604
50	0.823
60	1.104
70	1.461
80	1.909
90	2.465
100	3.147
110	3.977
120	4.977
130	6.171
140	7.586
150	9.250
160	11.190
170	13.450
180	16.050
190	19.030
200	22.420
210	26.270
220	30.610
230	35.480
240	40.930

9.26 SATURATED VAPOR DENSITY	
Temperature (degrees F)	Pounds per cubic foot
0	0.00216
10	0.00310
20	0.00435
30	0.00599
40	0.00812
50	0.01085
60	0.01427
70	0.01853
80	0.02376
90	0.03012
100	0.03778
110	0.04690
120	0.05768
130	0.07030
140	0.08498
150	0.10190
160	0.12130
170	0.14350
180	0.16850
190	0.19670
200	0.22830
210	0.26350
220	0.30250
230	0.34560
240	0.39290

9.27 IDEAL GAS HEAT CAPACITY	
Temperature (degrees F)	British thermal unit per pound-F
0	0.352
25	0.368
50	0.384
75	0.399
100	0.414
125	0.429
150	0.444
175	0.458
200	0.472
225	0.486
250	0.500
275	0.513
300	0.526
325	0.538
350	0.551
375	0.563
400	0.575
425	0.586
450	0.598
475	0.609
500	0.620
525	0.630
550	0.640
575	0.650
600	0.660