

# METHYL ACRYLATE

MAM

## CAUTIONARY RESPONSE INFORMATION

|  |  |               |           |                  |
|--|--|---------------|-----------|------------------|
| <b>Common Synonyms</b><br>Acrylic acid, methyl ester<br>Methyl 2-propenoate  |  | Watery liquid | Colorless | Sweet sharp odor |
| Floats and mixes slowly with water. Flammable, irritating vapor is produced.   |  |               |           |                  |
| <p>Evacuate.<br/>                 Keep people away. Avoid contact with liquid and vapor.<br/>                 Wear chemical protective suit with self-contained breathing apparatus.<br/>                 Shut off ignition sources and call fire department.<br/>                 Stay upwind and use water spray to "knock down" vapor.<br/>                 Notify local health and pollution control agencies.</p> |  |               |           |                  |
| <b>Fire</b>  | <p><b>FLAMMABLE.</b><br/>                 Flashback along vapor trail may occur.<br/>                 Containers may explode when heated.<br/>                 Vapor may explode if ignited in an enclosed area.<br/>                 Wear chemical protective suit with self-contained breathing apparatus.<br/>                 Combat fires from safe distance or protected location.<br/>                 Extinguish with dry chemical, foam, or carbon dioxide.<br/>                 Water may be ineffective on fire.<br/>                 Cool exposed containers with water.</p>   |               |           |                  |
| <b>Exposure</b>  | <p><b>CALL FOR MEDICAL AID.</b></p> <p><b>VAPOR</b><br/>                 Irritating to eyes, nose and throat.<br/>                 If inhaled, will cause dizziness or difficult breathing.<br/>                 Move to fresh air.<br/>                 If breathing has stopped, give artificial respiration.<br/>                 If breathing is difficult, give oxygen.</p> <p><b>LIQUID</b><br/>                 Will burn skin and eyes.<br/>                 Harmful if swallowed.<br/>                 Remove contaminated clothing.<br/>                 Flush affected areas with plenty of water.<br/>                 IF IN EYES, hold eyelids open and flush with plenty of water.<br/>                 IF SWALLOWED and victim is CONSCIOUS, have victim drink water or milk.</p> |               |           |                  |
| <b>Water Pollution</b>   | <p>Effect of low concentrations on aquatic life is unknown.<br/>                 Fouling to shoreline.<br/>                 May be dangerous if it enters water intakes.<br/>                 Notify local health and wildlife officials.<br/>                 Notify operators of nearby water intakes.</p>   |               |           |                  |

### 1. CORRECTIVE RESPONSE ACTIONS

Dilute and disperse  
 Stop discharge  
 Collection Systems: Skim  
 Clean shore line  
 Salvage waterfowl

### 2. CHEMICAL DESIGNATIONS

2.1 **CG Compatibility Group:** 14; Acrylate  
 2.2 **Formula:** CH<sub>2</sub>=CHCOOCH<sub>3</sub>  
 2.3 **IMO/UN Designation:** 3.2/1919  
 2.4 **DOT ID No.:** 1919  
 2.5 **CAS Registry No.:** 96-33-3  
 2.6 **NAERG Guide No.:** 129P  
 2.7 **Standard Industrial Trade Classification:** 51379

### 3. HEALTH HAZARDS

- 3.1 **Personal Protective Equipment:** Organic canister for high vapor concentrations; rubber gloves; chemical goggles or face shield.
- 3.2 **Symptoms Following Exposure:** May irritate skin, eyes, respiratory system, and gastro-intestinal tract. Fumes cause tears.
- 3.3 **Treatment of Exposure:** INHALATION: remove to fresh air; lay patient down; keep him warm; administer artificial respiration if breathing has stopped; administer oxygen. SKIN OR EYES: flush with plenty of water for 15 min.; consult physician for eye exposure.
- 3.4 **TLV-TWA:** 2 ppm
- 3.5 **TLV-STEL:** Not listed.
- 3.6 **TLV-Ceiling:** Not listed.
- 3.7 **Toxicity by Ingestion:** Grade 3; LD<sub>50</sub> = 50 to 500 mg/kg (rabbit)
- 3.8 **Toxicity by Inhalation:** Currently not available.
- 3.9 **Chronic Toxicity:** Currently not available
- 3.10 **Vapor (Gas) Irritant Characteristics:** Vapor is moderately irritating such that personnel will not usually tolerate moderate or high vapor concentrations.
- 3.11 **Liquid or Solid Characteristics:** Causes smarting of the skin and first-degree burns on short exposure; may cause secondary burns on long exposure.
- 3.12 **Odor Threshold:** Currently not available
- 3.13 **IDLH Value:** 250 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:** 44°F O.C. 27°F C.C.
- 4.2 **Flammable Limits in Air:** 2.8%-25%
- 4.3 **Fire Extinguishing Agents:** 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:** Irritating vapors are generated in fires.
- 4.6 **Behavior in Fire:** May polymerize. Vapor is heavier than air and may travel considerable distance to a source of ignition and flash back.
- 4.7 **Auto Ignition Temperature:** Currently not available
- 4.8 **Electrical Hazards:** Not pertinent
- 4.9 **Burning Rate:** Currently not available
- 4.10 **Adiabatic Flame Temperature:** Currently not available
- 4.11 **Stoichiometric Air to Fuel Ratio:** 21.4 (calc.)
- 4.12 **Flame Temperature:** Currently not available
- 4.13 **Combustion Molar Ratio (Reactant to Product):** 7.0 (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:** Heat may cause an exothermic polymerization. Strong ultraviolet light can also initiate polymerization.
- 5.6 **Inhibitor of Polymerization:** Hydroquinone and its methyl ether, in presence of air.

### 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:**  
 Bioaccumulation: 0  
 Damage to living resources: 3  
 Human Oral hazard: 2  
 Human Contact hazard: II  
 Reduction of amenities: XXX

### 7. SHIPPING INFORMATION

- 7.1 **Grades of Purity:** 99.9%
- 7.2 **Storage Temperature:** Ambient if material is inhibited; under 40°F if no inhibitor.
- 7.3 **Inert Atmosphere:** Air MUST be present.
- 7.4 **Venting:** Open (flame arrester)
- 7.5 **IMO Pollution Category:** B
- 7.6 **Ship Type:** 2
- 7.7 **Barge Hull Type:** 3

### 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)..... | 2              |
| Flammability (Red).....   | 3              |
| Instability (Yellow)..... | 2              |
- 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:** 86.09
- 9.3 **Boiling Point at 1 atm:** 177°F = 80.6°C = 353.8°K
- 9.4 **Freezing Point:** -105.7°F = -76.5°C = 196.7°K
- 9.5 **Critical Temperature:** 505.4°F = 263°C = 536.2°K
- 9.6 **Critical Pressure:** 630 psia = 43 atm = 4.3 MN/m<sup>2</sup>
- 9.7 **Specific Gravity:** 0.956 at 20°C (liquid)
- 9.8 **Liquid Surface Tension:** 24.2 dynes/cm = 0.0242 N/m at 20°C
- 9.9 **Liquid Water Interfacial Tension:** (est.) 30 dynes/cm = 0.03 N/m at 20°C
- 9.10 **Vapor (Gas) Specific Gravity:** 3.0
- 9.11 **Ratio of Specific Heats of Vapor (Gas):** 1.102
- 9.12 **Latent Heat of Vaporization:** 160 Btu/lb = 90 cal/g = 3.8 X 10<sup>5</sup> J/kg
- 9.13 **Heat of Combustion:** (est.) -9900 Btu/lb = -5500 cal/g = -230 X 10<sup>6</sup> J/kg
- 9.14 **Heat of Decomposition:** Not pertinent
- 9.15 **Heat of Solution:** Not pertinent
- 9.16 **Heat of Polymerization:** -392 Btu/lb = -218 cal/g = -9.13 X 10<sup>5</sup> J/kg
- 9.17 **Heat of Fusion:** Currently not available
- 9.18 **Limiting Value:** Currently not available
- 9.19 **Reid Vapor Pressure:** 3.1 psia

### NOTES

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| 9.20<br>SATURATED LIQUID DENSITY |                       | 9.21<br>LIQUID HEAT CAPACITY |                                     | 9.22<br>LIQUID THERMAL CONDUCTIVITY |   | 9.23<br>LIQUID VISCOSITY   |            |
|----------------------------------|-----------------------|------------------------------|-------------------------------------|-------------------------------------|---|----------------------------|------------|
| Temperature<br>(degrees F)       | Pounds per cubic foot | Temperature<br>(degrees F)   | British thermal unit per<br>pound-F | Temperature<br>(degrees F)          | British thermal unit inch<br>per hour-square foot-F | Temperature<br>(degrees F) | Centipoise |
| 34                               | 61.090                | 0                            | 0.427                               | 0                                   | 1.258   | 20                         | 0.708      |
| 36                               | 61.010                | 10                           | 0.430                               | 10                                  | 1.238   | 30                         | 0.651      |
| 38                               | 60.920                | 20                           | 0.433                               | 20                                  | 1.217   | 40                         | 0.601      |
| 40                               | 60.840                | 30                           | 0.436                               | 30                                  | 1.197   | 50                         | 0.557      |
| 42                               | 60.760                | 40                           | 0.439                               | 40                                  | 1.177   | 60                         | 0.517      |
| 44                               | 60.670                | 50                           | 0.443                               | 50                                  | 1.157   | 70                         | 0.482      |
| 46                               | 60.590                | 60                           | 0.446                               | 60                                  | 1.137   | 80                         | 0.450      |
| 48                               | 60.510                | 70                           | 0.449                               | 70                                  | 1.117   | 90                         | 0.421      |
| 50                               | 60.430                | 80                           | 0.452                               | 80                                  | 1.097   | 100                        | 0.395      |
| 52                               | 60.340                | 90                           | 0.455                               | 90                                  | 1.076   | 110                        | 0.372      |
| 54                               | 60.260                | 100                          | 0.458                               | 100                                 | 1.056   | 120                        | 0.350      |
| 56                               | 60.180                | 110                          | 0.462                               | 110                                 | 1.036   | 130                        | 0.331      |
| 58                               | 60.090                | 120                          | 0.465                               | 120                                 | 1.016   | 140                        | 0.313      |
| 60                               | 60.010                | 130                          | 0.468                               | 130                                 | 0.996   | 150                        | 0.297      |
| 62                               | 59.930                | 140                          | 0.471                               | 140                                 | 0.976   | 160                        | 0.282      |
| 64                               | 59.840                | 150                          | 0.474                               | 150                                 | 0.955   | 170                        | 0.268      |
| 66                               | 59.760                | 160                          | 0.477                               | 160                                 | 0.935   |                            |            |
| 68                               | 59.680                | 170                          | 0.481                               | 170                                 | 0.915   |                            |            |
| 70                               | 59.590                |                              |                                     |                                     |   |                            |            |
| 72                               | 59.510                |                              |                                     |                                     |   |                            |            |
| 74                               | 59.430                |                              |                                     |                                     |   |                            |            |
| 76                               | 59.340                |                              |                                     |                                     |   |                            |            |
| 78                               | 59.260                |                              |                                     |                                     |   |                            |            |
| 80                               | 59.180                |                              |                                     |                                     |   |                            |            |
| 82                               | 59.090                |                              |                                     |                                     |   |                            |            |
| 84                               | 59.010                |                              |                                     |                                     |   |                            |            |

| 9.24<br>SOLUBILITY IN WATER |                                   | 9.25<br>SATURATED VAPOR PRESSURE |                        | 9.26<br>SATURATED VAPOR DENSITY |                       | 9.27<br>IDEAL GAS HEAT CAPACITY |                                     |
|-----------------------------|-----------------------------------|----------------------------------|------------------------|---------------------------------|-----------------------|---------------------------------|-------------------------------------|
| Temperature<br>(degrees F)  | Pounds per 100 pounds<br>of water | Temperature<br>(degrees F)       | Pounds per square inch | Temperature<br>(degrees F)      | Pounds per cubic foot | Temperature<br>(degrees F)      | British thermal unit per<br>pound-F |
| 68                          | 5.500                             | 40                               | 0.547                  | 40                              | 0.00879               | 0                               | 0.224                               |
|                             |                                   | 50                               | 0.751                  | 50                              | 0.01182               | 25                              | 0.233                               |
|                             |                                   | 60                               | 1.015                  | 60                              | 0.01567               | 50                              | 0.242                               |
|                             |                                   | 70                               | 1.353                  | 70                              | 0.02049               | 75                              | 0.251                               |
|                             |                                   | 80                               | 1.779                  | 80                              | 0.02644               | 100                             | 0.259                               |
|                             |                                   | 90                               | 2.311                  | 90                              | 0.03372               | 125                             | 0.268                               |
|                             |                                   | 100                              | 2.967                  | 100                             | 0.04252               | 150                             | 0.276                               |
|                             |                                   | 110                              | 3.769                  | 110                             | 0.05305               | 175                             | 0.285                               |
|                             |                                   | 120                              | 4.738                  | 120                             | 0.06556               | 200                             | 0.293                               |
|                             |                                   | 130                              | 5.902                  | 130                             | 0.08027               | 225                             | 0.301                               |
|                             |                                   | 140                              | 7.285                  | 140                             | 0.09743               | 250                             | 0.310                               |
|                             |                                   | 150                              | 8.919                  | 150                             | 0.11730               | 275                             | 0.318                               |
|                             |                                   | 160                              | 10.830                 | 160                             | 0.14020               | 300                             | 0.326                               |
|                             |                                   | 170                              | 13.060                 | 170                             | 0.16630               | 325                             | 0.333                               |
|                             |                                   | 180                              | 15.630                 | 180                             | 0.19600               | 350                             | 0.341                               |
|                             |                                   | 190                              | 18.590                 | 190                             | 0.22950               | 375                             | 0.349                               |
|                             |                                   | 200                              | 21.970                 | 200                             | 0.26710               | 400                             | 0.356                               |
|                             |                                   | 210                              | 25.810                 | 210                             | 0.30910               | 425                             | 0.364                               |
|                             |                                   | 220                              | 30.150                 | 220                             | 0.35580               | 450                             | 0.371                               |
|                             |                                   | 230                              | 35.040                 | 230                             | 0.40750               | 475                             | 0.379                               |
|                             |                                   | 240                              | 40.510                 | 240                             | 0.46440               | 500                             | 0.386                               |
|                             |                                   |                                  |                        |                                 |                       | 525                             | 0.393                               |
|                             |                                   |                                  |                        |                                 |                       | 550                             | 0.400                               |
|                             |                                   |                                  |                        |                                 |                       | 575                             | 0.407                               |
|                             |                                   |                                  |                        |                                 |                       | 600                             | 0.414                               |