METHYL DIETHANOLAMINE

CAUTIOUS RESPONSE INFORMATION

<table>
<thead>
<tr>
<th>Common Synonyms</th>
<th>Liquid</th>
<th>Colorless</th>
</tr>
</thead>
<tbody>
<tr>
<td>MDEA 2,2'-Methyliminodiethanol</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Wear full imperious protective clothing and approved respirator. Shut off ignition sources and call fire department. Notify local health and pollution control agencies.

Fire

Combustible

Wear protective clothing with self-contained breathing apparatus. Extinguish fire with dry chemical, alcohol foam, carbon dioxide, water spray to cool exposed containers.

Exposure

CALL FOR MEDICAL AID.

VAPOR

Move victim to fresh air. If breathing has stopped, give artificial respiration. If breathing is difficult, give oxygen.

LIQUID

Irritating to skin and eyes. Remove contaminated clothing and shoes. Flush affected areas with water. If IN EYES, hold eyelids open and flush with plenty of water.

Water

Effect of low concentrations on aquatic life is unknown. Notify local health and wildlife officials.

Pollution

Notify operators of nearby water intakes.

1. CORRECTIVE RESPONSE ACTIONS

Stop discharge

2. CHEMICAL DESIGNATIONS

2.1 CG Compatibility Group: II, Amines

2.2 Formula: \(\text{CH}_3\text{CH(NH}_2\text{)CH}_2\text{OH}\)

2.3 IMO/UN Designation: Currently not available

2.4 DOT ID No.: Not listed.

2.5 CAS Registry No.: 105-59-9

2.6 NAERG Guide No.: Not listed

2.7 Standard Industrial Trade Classification: 51451

3. HEALTH HAZARDS

3.1 Personal Protective Equipment: Full imperious protective clothing, including boots and gloves. Use approved respirator to protect against vapors.

3.2 Symptoms Following Exposure: Exposure can cause irritation of eyes, nose and throat.

3.3 Treatment of Exposure: Get medical attention. INHALATION: Remove to fresh air. If breathing has stopped, give artificial respiration. If breathing is difficult, give oxygen. EYES: Flush with water for at least 15 min., lifting lids occasionally. SKIN: Remove contaminated clothing and shoes. Flush with water.

3.4 TLV-TWA: Not listed.

3.5 TLV-STEL: Not listed.

3.6 TLV-Ceiling: Not listed.

3.7 Toxicity by Ingestion: Grade 2; LDLo = 4.78 g/kg (rat).

3.6 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: Fairly severe skin irritant. May cause pain and second-degree burns after a few minutes’ contact.

3.12 Odor Threshold: Currently not available

3.13 IDLH Value: Not listed.

3.14 OSHA PEL-TWA: Not listed.

3.15 OSHA PEL-STEL: Not listed.

3.16 OSHA PEL-Ceiling: Not listed.

3.17 EPA AELG: Not listed

4. FIRE HAZARDS

4.1 Flash Point: 258.8°F C.C.

4.2 Flammable Limits in Air: Currently not available

4.3 Fire Extinguishing Agents: Dry chemical, alcohol foam, or carbon dioxide.

4.4 Fire Extinguishing Agents Not to Be Used: Water.

4.5 Special Hazards of Combustion Products: Irritating vapors and toxic gases, such as nitrogen oxides and carbon monoxide, may be formed when involved in fire.

4.6 Behavior in Fire: Currently not available

4.7 Auto Ignition Temperature: Currently not available

4.8 Electrical Hazards: Not listed.

4.9 Burning Rate: Currently not available

4.10 Adiabatic Flame Temperature: Currently not available

4.11 Stoichiometric Air to Fuel Ratio: 39.3 (calc.

4.12 Flame Temperature: Currently not available

4.13 Combustion Molar Ratio (Reactant to Product): 12.5 (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: Currently not available

5.3 Stability During Transport: Stable.

5.4 Neutralizing Agents for Acids and Caustics: Not pertinent.

5.5 Polymerization: Will not polymerize.

5.6 Inhibitor of Polymerization: Not pertinent.

6. WATER POLLUTION

6.1 Aquatic Toxicity: Currently not available

6.2 Waterflow Toxicity: Currently not available

6.3 Biological Oxygen Demand (BOD): Currently not available

6.4 Food Chain Concentration Potential: Currently not available

6.5 GESAMP Hazard Profile: Not listed

7. SHIPPING INFORMATION

7.1 Grades of Purity: 99%; technical grade.

7.2 Storage Temperature: Ambient.

7.3 Inert Atmosphere: No requirement.

7.4 Venting: Open.

7.5 IMO Pollution Category: D

7.6 Ship Type: 3

7.7 Barge Hull Type: 3

8. HAZARD CLASSIFICATIONS

8.1 CA Frangible Classification: Not listed.

8.2 CFR Class: Not pertinent.

8.3 CFR Package Number: Not listed.

8.4 Marine Pollution: No

8.5 NFPA Hazard Classification: Not listed

8.6 EPA Reportable Quantity: Not listed.

8.7 EPA Pollution Category: Not listed.

8.8 ROCA Waste Number: Not listed

8.9 EPA WP/PCA List: Not listed

9. PHYSICAL & CHEMICAL PROPERTIES

9.1 Physical State at 15°C and 1 atm: Liquid

9.2 Molecular Weight: 119.16

9.3 Boiling Point: Not listed

9.4 Melting Point: Not listed

9.5 Classification: Not listed.

9.6 Critical Temperature: Currently not available

9.7 Pressure: Currently not available

9.8 Specific Gravity: 1.0377 @ 20°C

9.9 Liquid Surface Tension: Currently not available

9.10 Surface Tenssion: Not listed

9.11 Ratio of Specific Heats of Vapor (Gas): Currently not available

9.12 Latent Heat of Vaporization: Currently not available

9.13 Heat of Combustion: Currently not available

9.14 Heat of Decomposition: Currently not available

9.15 Heat of Formation: 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 Flash Point: Not available

9.20 Vapor Pressure: Currently not available

NOTES
### Methyl Diethanolamine (MDE)

#### 9.20 Saturated Liquid Density

<table>
<thead>
<tr>
<th>Temperature (°F)</th>
<th>Pounds per cubic foot</th>
</tr>
</thead>
<tbody>
<tr>
<td>68</td>
<td>8.560</td>
</tr>
</tbody>
</table>

#### 9.21 Liquid Heat Capacity

<table>
<thead>
<tr>
<th>Temperature (°F)</th>
<th>British thermal unit per pound °F</th>
</tr>
</thead>
<tbody>
<tr>
<td>68</td>
<td>CURRENTLY NOT AVAILABLE</td>
</tr>
</tbody>
</table>

#### 9.22 Liquid Thermal Conductivity

<table>
<thead>
<tr>
<th>Temperature (°F)</th>
<th>British thermal unit inch per hour-square foot °F</th>
</tr>
</thead>
<tbody>
<tr>
<td>68</td>
<td>CURRENTLY NOT AVAILABLE</td>
</tr>
</tbody>
</table>

#### 9.23 Liquid Viscosity

<table>
<thead>
<tr>
<th>Temperature (°F)</th>
<th>Centipoise</th>
</tr>
</thead>
<tbody>
<tr>
<td>68</td>
<td>CURRENTLY NOT AVAILABLE</td>
</tr>
</tbody>
</table>

#### 9.24 Solubility in Water

<table>
<thead>
<tr>
<th>Temperature (°F)</th>
<th>Pounds per 100 pounds of water</th>
</tr>
</thead>
<tbody>
<tr>
<td>68</td>
<td>CURRENTLY NOT AVAILABLE</td>
</tr>
</tbody>
</table>

#### 9.25 Saturated Vapor Pressure

<table>
<thead>
<tr>
<th>Temperature (°F)</th>
<th>Pounds per square inch</th>
</tr>
</thead>
<tbody>
<tr>
<td>68</td>
<td>CURRENTLY NOT AVAILABLE</td>
</tr>
</tbody>
</table>

#### 9.26 Saturated Vapor Density

<table>
<thead>
<tr>
<th>Temperature (°F)</th>
<th>Pounds per cubic foot</th>
</tr>
</thead>
<tbody>
<tr>
<td>68</td>
<td>CURRENTLY NOT AVAILABLE</td>
</tr>
</tbody>
</table>

#### 9.27 Ideal Gas Heat Capacity

<table>
<thead>
<tr>
<th>Temperature (°F)</th>
<th>British thermal unit per pound °F</th>
</tr>
</thead>
<tbody>
<tr>
<td>68</td>
<td>CURRENTLY NOT AVAILABLE</td>
</tr>
</tbody>
</table>