

# ADIPIC ACID

ADA

| CAUTIONARY RESPONSE INFORMATION  |  |       |          | 4. FIRE HAZARDS  | 7. SHIPPING INFORMATION   |          |                |                      |   |                    |   |                      |   |
|--|--|-------|----------|--|---|----------|----------------|----------------------|---|--------------------|---|----------------------|---|
| Common Synonyms<br>Adipinic acid<br>1,4-Butanedicarboxylic acid<br>Hexanedioic acid  | Solid crystals<br>Sinks and mixes slowly with water. | White | Odorless | <p><b>4.1 Flash Point:</b> Combustible solid, 385°F O.C.; 376°F C.C.</p> <p><b>4.2 Flammable Limits in Air:</b> (dust) 10-15 mg/l</p> <p><b>4.3 Fire Extinguishing Agents:</b> Foam, water fog, carbon dioxide, or dry chemical.</p> <p><b>4.4 Fire Extinguishing Agents Not to Be Used:</b> Currently not available</p> <p><b>4.5 Special Hazards of Combustion Products:</b> Currently not available</p> <p><b>4.6 Behavior in Fire:</b> Melts and may decompose to give volatile acidic vapors of valeric acid and other substances. Dust may form explosive mixture with air.</p> <p><b>4.7 Auto Ignition Temperature:</b> 788°F; 450°F</p> <p><b>4.8 Electrical Hazards:</b> Not pertinent</p> <p><b>4.9 Burning Rate:</b> Not pertinent</p> <p><b>4.10 Adiabatic Flame Temperature:</b> Currently not available</p> <p><b>4.11 Stoichiometric Air to Fuel Ratio:</b> Currently not available</p> <p><b>4.12 Flame Temperature:</b> Currently not available</p> <p><b>4.13 Combustion Molar Ratio (Reactant to Product):</b> Currently not available</p> <p><b>4.14 Minimum Oxygen Concentration for Combustion (MOCC):</b> Not listed</p>  | <p><b>7.1 Grades of Purity:</b> Commercial, 99.8%</p> <p><b>7.2 Storage Temperature:</b> Ambient</p> <p><b>7.3 Inert Atmosphere:</b> No requirement</p> <p><b>7.4 Venting:</b> Open</p> <p><b>7.5 IMO Pollution Category:</b> Currently not available</p> <p><b>7.6 Ship Type:</b> Currently not available</p> <p><b>7.7 Barge Hull Type:</b> Currently not available</p> |          |                |                      |   |                    |   |                      |   |
| Stop discharge if possible. Keep people away.<br>Shut off ignition sources. Call fire department.<br>Avoid contact with solid and dust; avoid inhalation.<br>Isolate and remove discharged material.<br>Notify local health and pollution control agencies.<br>Protect water intakes.  |  |       |          | <p><b>8. HAZARD CLASSIFICATIONS</b></p> <p><b>8.1 49 CFR Category:</b> Not listed</p> <p><b>8.2 49 CFR Class:</b> Not pertinent</p> <p><b>8.3 49 CFR Package Group:</b> Not listed.</p> <p><b>8.4 Marine Pollutant:</b> No</p> <p><b>8.5 NFPA Hazard Classification:</b></p> <table> <tr> <td>Category</td> <td>Classification</td> </tr> <tr> <td>Health Hazard (Blue)</td> <td>-</td> </tr> <tr> <td>Flammability (Red)</td> <td>1</td> </tr> <tr> <td>Instability (Yellow)</td> <td>0</td> </tr> </table> <p><b>8.6 EPA Reportable Quantity:</b> 5000</p> <p><b>8.7 EPA Pollution Category:</b> D</p> <p><b>8.8 RCRA Waste Number:</b> Not listed</p> <p><b>8.9 EPA FWCNA List:</b> Yes</p>   |   | Category | Classification | Health Hazard (Blue) | - | Flammability (Red) | 1 | Instability (Yellow) | 0 |
| Category   | Classification                                       |       |          |  |   |          |                |                      |   |                    |   |                      |   |
| Health Hazard (Blue)   | -  |       |          |  |   |          |                |                      |   |                    |   |                      |   |
| Flammability (Red)   | 1  |       |          |  |   |          |                |                      |   |                    |   |                      |   |
| Instability (Yellow)   | 0  |       |          |  |   |          |                |                      |   |                    |   |                      |   |
| <b>Fire</b><br>Combustible.<br>Dust cloud may explode if ignited in an enclosed area.<br>Extinguish with water, dry chemicals, foam, or carbon dioxide.  |  |       |          | <p><b>9. PHYSICAL &amp; CHEMICAL PROPERTIES</b></p> <p><b>9.1 Physical State at 15°C and 1 atm:</b> Solid</p> <p><b>9.2 Molecular Weight:</b> 146.1</p> <p><b>9.3 Boiling Point at 1 atm:</b> Not pertinent 337.5°C</p> <p><b>9.4 Freezing Point:</b> 304°F = 151°C = 424°K</p> <p><b>9.5 Critical Temperature:</b> Not pertinent</p> <p><b>9.6 Critical Pressure:</b> Not pertinent</p> <p><b>9.7 Specific Gravity:</b> 1.36 at 20°C (solid)</p> <p><b>9.8 Liquid Surface Tension:</b> Not pertinent</p> <p><b>9.9 Liquid Water Interfacial Tension:</b> Not pertinent</p> <p><b>9.10 Vapor (Gas) Specific Gravity:</b> Not pertinent</p> <p><b>9.11 Ratio of Specific Heats of Vapor (Gas):</b> Not pertinent</p> <p><b>9.12 Latent Heat of Vaporization:</b> Not pertinent</p> <p><b>9.13 Heat of Combustion:</b> -8,242 Btu/lb = -4,579 cal/g = 191.6 X 10³ J/kg</p> <p><b>9.14 Heat of Decomposition:</b> Not pertinent</p> <p><b>9.15 Heat of Solution:</b> Not pertinent</p> <p><b>9.16 Heat of Polymerization:</b> Not pertinent</p> <p><b>9.17 Heat of Fusion:</b> Currently not available</p> <p><b>9.18 Limiting Value:</b> Currently not available</p> <p><b>9.19 Reid Vapor Pressure:</b> Currently not available</p> |   |          |                |                      |   |                    |   |                      |   |
| <b>Exposure</b><br>CALL FOR MEDICAL AID.<br>DUST<br>Irritating to eyes, nose and throat.<br>If inhaled will cause coughing or difficult breathing.<br>If in eyes, hold eyelids open and flush with plenty of water.<br>If breathing has stopped, give artificial respiration.<br>If breathing is difficult, give oxygen.<br><br>SOLID<br>Irritating to skin and eyes.<br>Harmful if swallowed.<br>Remove contaminated clothing and shoes.<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 UNCONSCIOUS OR HAVING CONVULSIONS, do nothing except keep victim warm.  |  |       |          | <p><b>5. CHEMICAL REACTIVITY</b></p> <p><b>5.1 Reactivity with Water:</b> No reaction</p> <p><b>5.2 Reactivity with Common Materials:</b> Currently not available</p> <p><b>5.3 Stability During Transport:</b> Stable</p> <p><b>5.4 Neutralizing Agents for Acids and Caustics:</b> Rinse with dilute sodium bicarbonate or soda ash solution.</p> <p><b>5.5 Polymerization:</b> Not pertinent</p> <p><b>5.6 Inhibitor of Polymerization:</b> Not pertinent</p> <p><b>6. WATER POLLUTION</b></p> <p><b>6.1 Aquatic Toxicity:</b> &lt;330 ppm/24 hr/bluegill/T<sub>LC50</sub>/fresh water</p> <p><b>6.2 Waterfowl Toxicity:</b> Currently not available</p> <p><b>6.3 Biological Oxygen Demand (BOD):</b> (theoretical) 1.3%, 0.5 days</p> <p><b>6.4 Food Chain Concentration Potential:</b> None</p> <p><b>6.5 GESAMP Hazard Profile:</b> Not listed</p>  |   |          |                |                      |   |                    |   |                      |   |
| <b>Water Pollution</b><br>Dangerous to aquatic life in high concentrations.<br>May be dangerous if it enters water intakes.<br>Notify local health and wildlife officials.<br>Notify operators of nearby water intakes.  |  |       |          | <p><b>NOTES</b></p>  |   |          |                |                      |   |                    |   |                      |   |
| <p><b>1. CORRECTIVE RESPONSE ACTIONS</b></p> <p>Stop discharge<br/>Collection Systems: Pump; Dredge</p> <p><b>2. CHEMICAL DESIGNATIONS</b></p> <p>2.1 CG Compatibility Group: Not listed</p> <p>2.2 Formula: HOOC(CH<sub>2</sub>)<sub>4</sub>COOH</p> <p>2.3 IMO/UN Designation: Currently not available</p> <p>2.4 DOT ID No.: Not listed</p> <p>2.5 CAS Registry No.: 124-04-9</p> <p>2.6 NAERG Guide No.: 153</p> <p>2.7 Standard Industrial Trade Classification: 51385</p> <p><b>3. HEALTH HAZARDS</b></p> <p>3.1 Personal Protective Equipment: Normal protection against exposure to finely divided organic solids (rubber gloves, plastic goggles)</p> <p>3.2 Symptoms Following Exposure: Inhalation of vapor irritates mucous membranes of the nose and lungs, causing coughing and sneezing. Contact with liquid irritates eyes and has a pronounced drying effect on the skin; may produce dermatitis.</p> <p>3.3 Treatment of Exposure: INHALATION: remove victim to fresh air; get medical attention if irritation persists. EYES: flush with water for at least 15 min. SKIN: flush with water.</p> <p>3.4 TLV-TWA: 5 mg/m³</p> <p>3.5 TLV-STEL: Not listed.</p> <p>3.6 TLV-Ceiling: Not listed.</p> <p>3.7 Toxicity by Ingestion: Grade 2; oral mouse LD<sub>50</sub> = 1,900 mg/kg; oral rat LD<sub>50</sub> = 5,050 mg/kg</p> <p>3.8 Toxicity by Inhalation: Currently not available.</p> <p>3.9 Chronic Toxicity: Currently not available</p> <p>3.10 Vapor (Gas) Irritant Characteristics: Currently not available</p> <p>3.11 Liquid or Solid Characteristics: Currently not available</p> <p>3.12 Odor Threshold: Currently not available</p> <p>3.13 IDLH Value: Not listed.</p> <p>3.14 OSHA PEL-TWA: Not listed.</p> <p>3.15 OSHA PEL-STEL: Not listed.</p> <p>3.16 OSHA PEL-Ceiling: Not listed.</p> <p>3.17 EPA A EGL: Not listed</p> |  |       |          |  |   |          |                |                      |   |                    |   |                      |   |

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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    |
|                                  | NOT PERTINENT         |                              | NOT PERTINENT                       |                                     | NOT PERTINENT                                       |                            | NOT PERTINENT |

| 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 |
| 34                          | 0.111                             | 395                              | 0.160                  | 395                             | 0.00254               |                                 | NOT                                 |
| 36                          | 0.222                             | 400                              | 0.180                  | 400                             | 0.00286               |                                 |                                     |
| 38                          | 0.333                             | 405                              | 0.204                  | 405                             | 0.00321               |                                 |                                     |
| 40                          | 0.444                             | 410                              | 0.230                  | 410                             | 0.00360               |                                 |                                     |
| 42                          | 0.555                             | 415                              | 0.259                  | 415                             | 0.00403               |                                 |                                     |
| 44                          | 0.666                             | 420                              | 0.291                  | 420                             | 0.00451               |                                 |                                     |
| 46                          | 0.777                             | 425                              | 0.327                  | 425                             | 0.00504               |                                 |                                     |
| 48                          | 0.889                             | 430                              | 0.367                  | 430                             | 0.00562               |                                 |                                     |
| 50                          | 1.000                             | 435                              | 0.412                  | 435                             | 0.00626               |                                 |                                     |
| 52                          | 1.111                             | 440                              | 0.461                  | 440                             | 0.00697               |                                 |                                     |
| 54                          | 1.222                             | 445                              | 0.515                  | 445                             | 0.00775               |                                 | PERTINENT                           |
| 56                          | 1.333                             | 450                              | 0.575                  | 450                             | 0.00860               |                                 |                                     |
| 58                          | 1.444                             | 455                              | 0.641                  | 455                             | 0.00954               |                                 |                                     |
| 60                          | 1.555                             | 460                              | 0.714                  | 460                             | 0.01056               |                                 |                                     |
| 62                          | 1.666                             | 465                              | 0.794                  | 465                             | 0.01169               |                                 |                                     |
| 64                          | 1.778                             | 470                              | 0.882                  | 470                             | 0.01292               |                                 |                                     |
| 66                          | 1.889                             | 475                              | 0.979                  | 475                             | 0.01426               |                                 |                                     |
| 68                          | 2.000                             | 480                              | 1.086                  | 480                             | 0.01572               |                                 |                                     |
| 70                          | 2.111                             | 485                              | 1.202                  | 485                             | 0.01732               |                                 |                                     |
| 72                          | 2.222                             | 490                              | 1.330                  | 490                             | 0.01906               |                                 |                                     |
| 74                          | 2.333                             | 495                              | 1.470                  | 495                             | 0.02095               |                                 |                                     |
| 76                          | 2.444                             | 500                              | 1.622                  | 500                             | 0.02301               |                                 |                                     |
| 78                          | 2.555                             | 505                              | 1.789                  | 505                             | 0.02524               |                                 |                                     |
| 80                          | 2.666                             | 510                              | 1.971                  | 510                             | 0.02766               |                                 |                                     |
| 82                          | 2.778                             | 515                              | 2.169                  | 515                             | 0.03029               |                                 |                                     |
| 84                          | 2.889                             |                                  |                        |                                 |                       |                                 |                                     |