1 Identification

· Product identifier
  · Trade name: Oleic Acid
  · Article number: 90260

· Application of the substance / the mixture
  This product is for research use - Not for human or veterinary diagnostic or therapeutic use.

· Details of the supplier of the safety data sheet
  · Manufacturer/Supplier: Cayman Chemical Co.
    1180 E. Ellsworth Rd.
    Ann Arbor, MI 48108
    USA
  · Information department: Product safety department
  · Emergency telephone number:
    During normal opening times: +1 (734) 971-3335
    US/CANADA: 800-424-9300
    Outside US/CANADA: 703-741-5970

2 Hazard(s) identification

· Classification of the substance or mixture
  GHS02 Flame
  Flam. Liq. 2 H225 Highly flammable liquid and vapor.

  GHS07
  Skin Irrit. 2 H315 Causes skin irritation.
  Eye Irrit. 2A H319 Causes serious eye irritation.
  STOT SE 3 H335 May cause respiratory irritation.

  Aquatic Acute 2 H401 Toxic to aquatic life.

· Label elements
  · GHS label elements
    The product is classified and labeled according to the Globally Harmonized System (GHS).
Trade name: Oleic Acid

· Hazard pictograms

![Hazard pictograms](image)

GHS02 GHS07

· Signal word Danger

· Hazard-determining components of labeling:
  Oleic Acid

· Hazard statements
  H225 Highly flammable liquid and vapor.
  H315 Causes skin irritation.
  H319 Causes serious eye irritation.
  H335 May cause respiratory irritation.
  H401 Toxic to aquatic life.

· Precautionary statements
  P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
  P240 Ground/bond container and receiving equipment.
  P241 Use explosion-proof electrical/ventilating/lighting/equipment.
  P242 Use only non-sparking tools.
  P243 Take precautionary measures against static discharge.
  P261 Avoid breathing dust/fume/gas/mist/vapors/spray
  P264 Wash thoroughly after handling.
  P271 Use only outdoors or in a well-ventilated area.
  P273 Avoid release to the environment.
  P280 Wear protective gloves/protective clothing/eye protection/face protection.
  P303+P361+P353 If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
  P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
  P305+P351+P338 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
  P312 Call a poison center/doctor if you feel unwell.
  P321 Specific treatment (see on this label).
  P362+P364 Take off contaminated clothing and wash it before reuse.
  P332+P313 If skin irritation occurs: Get medical advice/attention.
  P337+P313 If eye irritation persists: Get medical advice/attention.
  P370+P378 In case of fire: Use CO2, powder or water spray to extinguish.
  P403+P233 Store in a well-ventilated place. Keep container tightly closed.
  P403+P235 Store in a well-ventilated place. Keep cool.
  P405 Store locked up.
  P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

· Classification system:
  · NFPA ratings (scale 0 - 4)

  ![NFPA ratings](image)

  Health = 2
  Fire = 3
  Reactivity = 0

  · HMIS-ratings (scale 0 - 4)

  ![HMIS-ratings](image)

  Health = 2
  Fire = 3
  Reactivity = 0
Trade name: Oleic Acid

· Other hazards
  · Results of PBT and vPvB assessment
    · PBT: Not applicable.
    · vPvB: Not applicable.

3 Composition/information on ingredients

· Chemical characterization: Mixtures
  · Description: Mixture of the substances listed below with nonhazardous additions.
  · Dangerous components:

<table>
<thead>
<tr>
<th>CAS</th>
<th>Substance</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>64-17-5</td>
<td>ethanol</td>
<td>50.0%</td>
</tr>
<tr>
<td>KQ6300000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>112-80-1</td>
<td>Oleic Acid</td>
<td>50.0%</td>
</tr>
<tr>
<td>RG2275000</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4 First-aid measures

· Description of first aid measures
  · General information: Immediately remove any clothing soiled by the product.
  · After inhalation: In case of unconsciousness place patient stably in side position for transportation.
  · After skin contact: Immediately wash with water and soap and rinse thoroughly.
  · After eye contact: Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
  · After swallowing: If symptoms persist consult doctor.
  · Information for doctor:
    · Most important symptoms and effects, both acute and delayed
      May cause anemia, cough, CNS depression, drowsiness, headache, heart damage, lassitude (weakness, exhaustion), liver damage, narcosis, reproductive effects, teratogenic effects.
    · No further relevant information available.
  · Indication of any immediate medical attention and special treatment needed
    No further relevant information available.

5 Fire-fighting measures

· Extinguishing media
  · Suitable extinguishing agents:
    CO2, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
  · Special hazards arising from the substance or mixture
    Can release vapors that form explosive mixtures at temperatures at or above the flashpoint.
    Container explosion may occur under fire conditions.
    Emits toxic fumes under fire conditions.
    Sensitive to static discharge.
    Vapors can travel to a source of ignition and flash back.
  · Advice for firefighters
  · Protective equipment: No special measures required.
6 Accidental release measures

- Personal precautions, protective equipment and emergency procedures
  Wear protective equipment. Keep unprotected persons away.
- Environmental precautions:
  Do not allow product to reach sewage system or any water course.
  Inform respective authorities in case of seepage into water course or sewage system.
  Dilute with plenty of water.
  Do not allow to enter sewers/ surface or ground water.
- Methods and material for containment and cleaning up:
  Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
  Dispose contaminated material as waste according to item 13.
  Ensure adequate ventilation.
- Reference to other sections
  See Section 7 for information on safe handling.
  See Section 8 for information on personal protection equipment.
  See Section 13 for disposal information.
- Protective Action Criteria for Chemicals

  PAC-1:
  64-17-5 ethanol 1,800 ppm
  112-80-1 Oleic Acid 220 mg/m³

  PAC-2:
  64-17-5 ethanol 3300* ppm
  112-80-1 Oleic Acid 2,400 mg/m³

  PAC-3:
  64-17-5 ethanol 15000* ppm
  112-80-1 Oleic Acid 15,000 mg/m³

7 Handling and storage

- Handling:
  - Precautions for safe handling
    Ensure good ventilation/exhaustion at the workplace.
    Prevent formation of aerosols.
  - Information about protection against explosions and fires:
    Keep ignition sources away - Do not smoke.
    Protect against electrostatic charges.
- Conditions for safe storage, including any incompatibilities
- Storage: Store in accordance with information listed on the product insert.
- Requirements to be met by storerooms and receptacles: Store in a cool location.
- Information about storage in one common storage facility: Not required.
- Further information about storage conditions:
  - Keep receptacle tightly sealed.
  - Store in cool, dry conditions in well sealed receptacles.
- Specific end use(s) No further relevant information available.

8 Exposure controls/personal protection

- Additional information about design of technical systems: No further data; see item 7.
· Control parameters
  · Components with limit values that require monitoring at the workplace:
    The following constituent is the only constituent of the product which has a PEL, TLV or other
    recommended exposure limit.
    At this time, the remaining constituent has no known exposure limits.

<table>
<thead>
<tr>
<th>64-17-5 ethanol</th>
</tr>
</thead>
<tbody>
<tr>
<td>PEL</td>
</tr>
<tr>
<td>Long-term value: 1900 mg/m³, 1000 ppm</td>
</tr>
<tr>
<td>REL</td>
</tr>
<tr>
<td>Long-term value: 1900 mg/m³, 1000 ppm</td>
</tr>
<tr>
<td>TLV</td>
</tr>
<tr>
<td>Short-term value: 1000 ppm</td>
</tr>
</tbody>
</table>

· Additional information: The lists that were valid during the creation were used as basis.

· Exposure controls
  · Personal protective equipment:
  · General protective and hygienic measures:
    Keep away from foodstuffs, beverages and feed.
    Immediately remove all soiled and contaminated clothing.
    Wash hands before breaks and at the end of work.
    Avoid contact with the eyes and skin.
  · Breathing equipment:
    In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer
    exposure use respiratory protective device that is independent of circulating air.

· Protection of hands:

  Protective gloves

  The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
  Due to missing tests no recommendation to the glove material can be given for the product/ the
  preparation/ the chemical mixture.
  Selection of the glove material on consideration of the penetration times, rates of diffusion and the
  degradation

· Material of gloves

  The selection of the suitable gloves does not only depend on the material, but also on further marks of
  quality and varies from manufacturer to manufacturer. As the product is a preparation of several
  substances, the resistance of the glove material can not be calculated in advance and has therefore to
  be checked prior to the application.

· Penetration time of glove material

  The exact break through time has to be found out by the manufacturer of the protective gloves and has
  to be observed.

· Eye protection:

  Tightly sealed goggles
**9 Physical and chemical properties**

- **Information on basic physical and chemical properties**
  - **General Information**
  - **Appearance:**
    - Form: Liquid
    - Color: According to product specification
  - **Odor:** Characteristic
  - **Structural Formula:** C18H34O2
  - **Molecular Weight:** 282.5
  - **Odor threshold:** Not determined.
  - **Formulation:** A solution in ethanol

- **pH-value:** Not determined.

- **Change in condition**
  - **Melting point/Melting range:** Undetermined.
  - **Boiling point/Boiling range:** 78 °C (172.4 °F)

- **Flash point:** 13 °C (55.4 °F)

- **Flammability (solid, gaseous):** Not applicable.

- **Ignition temperature:** 360 °C (680 °F)

- **Decomposition temperature:** Not determined.

- **Auto igniting:** Product is not selfigniting.

- **Danger of explosion:** Product is not explosive. However, formation of explosive air/vapor mixtures are possible.

- **Explosion limits:**
  - **Lower:** 3.5 Vol %
  - **Upper:** 15 Vol %

- **Vapor pressure at 20 °C (68 °F):** 59 hPa (44.3 mm Hg)

- **Density at 20 °C (68 °F):** 0.845 g/cm³ (7.05153 lbs/gal)

- **Bulk density:** 842 kg/m³

- **Relative density:** Not determined.

- **Vapor density:** Not determined.

- **Evaporation rate:** Not determined.

- **Solubility in / Miscibility with Water:** Fully miscible.

- **Partition coefficient (n-octanol/water):** Not determined.

- **Viscosity:**
  - **Dynamic:** Not determined.
  - **Kinematic:** Not determined.

- **SOLUBILITY**
  - 0.15 M Tris-HCl pH 8.5: >1 mg/ml; DMF: >100 mg/ml; DMSO: >100 mg/ml; EtOH: >100 mg/ml

- **Solvent content:**
  - **Organic solvents:** 50.0 %
  - **VOC content:** 50.00 %
  - 422.5 g/l / 3.53 lb/gal
Trade name: Oleic Acid

Solids content: 50.0 %

Other information: No further relevant information available.

10 Stability and reactivity

- Reactivity: No further relevant information available.
- Chemical stability:
- Thermal decomposition / conditions to be avoided:
  No decomposition if used according to specifications.
- Possibility of hazardous reactions: No dangerous reactions known.
- Conditions to avoid: No further relevant information available.
- Incompatible materials: No further relevant information available.
- Hazardous decomposition products: No dangerous decomposition products known.

11 Toxicological information

- Information on toxicological effects:
- Acute toxicity:
  - LD/LC50 values that are relevant for classification:
    64-17-5 ethanol
    | Oral     | TDLO | 1.14 ml/kg (man) |
    |          | LD50 | 7,060 mg/kg (rat) |
    | Dermal   | LD50 | 40,000 mg/kg (rat) |
    | Inhalative | TCLO | 1,800 (hmn) |
    |           | LC50 | 10 h - 20,000 mg/m³ (rat) |
    | Irritation of skin | TDLO | 1,800 mg/kg (wmn) |
    | Intraperitoneal LD50 | 280 mg/kg (rat) |

    112-80-1 Oleic Acid
    | Oral    | LD50 | 28,000 mg/kg (mouse) |
    |         | Interperitoneal LDLO | 25,000 mg/kg (rat) |
    |         | Intravenous LD50     | 282 mg/kg (mouse) |
    |         |                      | 230 mg/kg (mouse) |
    |         |                      | 2.4 mg/kg (rat) |

- Primary irritant effect:
  - on the skin: Irritant to skin and mucous membranes.
  - on the eye: Irritating effect.
  - Sensitization: No sensitizing effects known.
  - Additional toxicological information:
    The product shows the following dangers according to internally approved calculation methods for preparations:
    Irritant

(Contd. on page 8)
Trade name: Oleic Acid

12 Ecological information

- Toxicity
  - Aquatic toxicity: No further relevant information available.
  - Persistence and degradability: No further relevant information available.
  - Behavior in environmental systems:
    - Bioaccumulative potential: No further relevant information available.
    - Mobility in soil: No further relevant information available.
  - Additional ecological information:
    - General notes:
      Water hazard class 1 (Self-assessment): slightly hazardous for water
      Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
    - Results of PBT and vPvB assessment
      - PBT: Not applicable.
      - vPvB: Not applicable.
    - Other adverse effects: No further relevant information available.

13 Disposal considerations

- Waste treatment methods
  - Recommendation:
    Must not be disposed of together with household garbage. Do not allow product to reach sewage system.
  - Uncleaned packagings:
    - Recommendation: Disposal must be made according to official regulations.
    - Recommended cleansing agent: Water, if necessary with cleansing agents.

14 Transport information

- UN-Number
  - DOT, IMDG, IATA: UN1170

- UN proper shipping name
  - DOT: Ethanol solutions
  - IMDG: ETHANOL SOLUTION (ETHYL ALCOHOL SOLUTION)
  - IATA: Ethanol solution
<table>
<thead>
<tr>
<th><strong>Trade name:</strong> Oleic Acid</th>
</tr>
</thead>
</table>

### Transport hazard class(es)

- **DOT**
  - **Class:** 3 Flammable liquids
  - **Label:** 3

- **IMDG, IATA**
  - **Class:** 3 Flammable liquids
  - **Label:** 3

### Packing group

- **DOT, IMDG, IATA:** II

### Environmental hazards:

Not applicable.

### Special precautions for user

- **Hazard identification number (Kemler code):** 33
- **EMS Number:** F-E,S-D
- **Stowage Category:** A

### Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

Not applicable.

### Transport/Additional information:

- **DOT**
  - **Quantity limitations**
    - On passenger aircraft/rail: 5 L
    - On cargo aircraft only: 60 L

- **IMDG**
  - **Limited quantities (LQ):** 1L
  - **Excepted quantities (EQ):** Code: E2
    - Maximum net quantity per inner packaging: 30 ml
    - Maximum net quantity per outer packaging: 500 ml

- **IATA**
  - **Remarks:**
    - When sold in quantities of less than or equal to 1 mL, or 1 g, with an Excepted Quantity Code of E1, E2, E4, or E5, this item meets the De Minimis Quantities exemption, per IATA 2.6.10.
    - Therefore packaging does not have to be labeled as Dangerous Goods/Excepted Quantity.

### UN "Model Regulation":

UN 1170 ETHANOL SOLUTION (ETHYL ALCOHOL SOLUTION), 3, II
15 Regulatory information

- Safety, health and environmental regulations/legislation specific for the substance or mixture
  No further relevant information available.
- Sara
  - Section 355 (extremely hazardous substances):
    None of the ingredients is listed.
- Section 313 (Specific toxic chemical listings):
  None of the ingredients is listed.
- TSCA (Toxic Substances Control Act):
  All components have the value ACTIVE.
- Hazardous Air Pollutants
  None of the ingredients is listed.
- Proposition 65
  - Chemicals known to cause cancer:
    None of the ingredients is listed.
  - Chemicals known to cause reproductive toxicity for females:
    None of the ingredients is listed.
  - Chemicals known to cause reproductive toxicity for males:
    None of the ingredients is listed.
  - Chemicals known to cause developmental toxicity:
    64-17-5 ethanol
- Carcinogenic categories
  - EPA (Environmental Protection Agency)
    None of the ingredients is listed.
- TLV (Threshold Limit Value)
  64-17-5 ethanol A3
- NIOSH-Ca (National Institute for Occupational Safety and Health)
  None of the ingredients is listed.
- Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

16 Other information

All chemicals may pose unknown hazards and should be used with caution. This SDS applies only to the material as packaged. If this product is combined with other materials, deteriorates, or becomes contaminated, it may pose hazards not mentioned in this SDS. Cayman Chemical Company assumes no responsibility for incidental or consequential damages, including lost profits, arising from the use of these data. It shall be the user's responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. While this SDS is based on technical data judged to be reliable, Cayman Chemical Company assumes no responsibility for the completeness or accuracy of the information contained herein.

- Department issuing SDS: Environment protection department.
- Contact: -
- Date of preparation / last revision 03/31/2022 / -
- Abbreviations and acronyms:
  IMDG: International Maritime Code for Dangerous Goods
  DOT: US Department of Transportation
## Trade name: Oleic Acid

### Trade Name: Oleic Acid

- **IATA**: International Air Transport Association
- **EINECS**: European Inventory of Existing Commercial Chemical Substances
- **ELINCS**: European List of Notified Chemical Substances
- **CAS**: Chemical Abstracts Service (division of the American Chemical Society)
- **NFPA**: National Fire Protection Association (USA)
- **HMSC**: Hazardous Materials Identification System (USA)
- **VOC**: Volatile Organic Compounds (USA, EU)
- **LC50**: Lethal concentration, 50 percent
- **LD50**: Lethal dose, 50 percent
- **PBT**: Persistent, Bioaccumulative and Toxic
- **vPvB**: very Persistent and very Bioaccumulative
- **NIOSH**: National Institute for Occupational Safety
- **OSHA**: Occupational Safety & Health
- **TLV**: Threshold Limit Value
- **REL**: Recommended Exposure Limit
- **Flam. Liq. 2**: Flammable liquids – Category 2
- **Skin Irrit. 2**: Skin corrosion/irritation – Category 2
- **Eye Irrit. 2A**: Serious eye damage/eye irritation – Category 2A
- **STOT SE 3**: Specific target organ toxicity (single exposure) – Category 3
- **Aquatic Acute 2**: Hazardous to the aquatic environment - acute aquatic hazard – Category 2

*Data compared to the previous version altered.*