Section 1 - Product and Company Information

Product Name: GLYCOLIC ACID, 99%
Product Number: 124737
Brand: SIAL
Company: Sigma-Aldrich Canada, Ltd
Address: 2149 Winston Park Drive
Oakville ON L6H 6J8 CA
Technical Phone: 9058299500
Fax: 9058299292
Emergency Phone: 800-424-9300

Section 2 - Composition/Information on Ingredient

<table>
<thead>
<tr>
<th>Substance Name</th>
<th>CAS #</th>
<th>SARA 313</th>
</tr>
</thead>
<tbody>
<tr>
<td>GLYCOLIC ACID</td>
<td>79-14-1</td>
<td>No</td>
</tr>
</tbody>
</table>

Formula: C2H4O3
Synonyms: Acetic acid, hydroxy- * Kyselina glykolova (Czech) * Kyselina hydroxyoctova (Czech) * Hydroxyacetic acid * alpha-Hydroxyacetic acid * 2-Hydroxyacetic acid * Hydroxyethanoic acid
RTECS Number: MC5250000

Section 3 - Hazards Identification

EMERGENCY OVERVIEW
Corrosive.
Causes burns. Harmful if swallowed.

HMIS RATING
HEALTH: 3
FLAMMABILITY: 0
REACTIVITY: 0

NFPA RATING
HEALTH: 3
FLAMMABILITY: 0
REACTIVITY: 0

For additional information on toxicity, please refer to Section 11.

Section 4 - First Aid Measures

ORAL EXPOSURE
If swallowed, wash out mouth with water provided person is conscious. Call a physician immediately.

INHALATION EXPOSURE
If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen.
DERMAL EXPOSURE
In case of skin contact, flush with copious amounts of water for at least 15 minutes. Remove contaminated clothing and shoes. Call a physician.

EYE EXPOSURE
In case of contact with eyes, flush with copious amounts of water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Call a physician.

Section 5 - Fire Fighting Measures

FLASH POINT
N/A

AUTOIGNITION TEMP
N/A

FLAMMABILITY
N/A

EXTINGUISHING MEDIA
Suitable: Water spray. Carbon dioxide, dry chemical powder, or appropriate foam.

FIREFIGHTING
Protective Equipment: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes. Specific Hazard(s): Emits toxic fumes under fire conditions.

Section 6 - Accidental Release Measures

PROCEDURE TO BE FOLLOWED IN CASE OF LEAK OR SPILL
Evacuate area.

PROCEDURE(S) OF PERSONAL PRECAUTION(S)
Wear self-contained breathing apparatus, rubber boots, and heavy rubber gloves.

METHODS FOR CLEANING UP
Sweep up, place in a bag and hold for waste disposal. Ventilate area and wash spill site after material pickup is complete.

Section 7 - Handling and Storage

HANDLING
User Exposure: Do not breathe dust. Do not get in eyes, on skin, on clothing. Avoid prolonged or repeated exposure.

STORAGE
Suitable: Keep tightly closed.

Section 8 - Exposure Controls / PPE

ENGINEERING CONTROLS
Safety shower and eye bath. Use only in a chemical fume hood.

PERSONAL PROTECTIVE EQUIPMENT
Respiratory: Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU). Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or
type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Hand: Compatible chemical-resistant gloves. Eye: Chemical safety goggles.

GENERAL HYGIENE MEASURES
Wash contaminated clothing before reuse. Discard contaminated shoes. Wash thoroughly after handling.

Section 9 - Physical/Chemical Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
<th>At Temperature or Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Physical State: Solid</td>
<td></td>
</tr>
<tr>
<td>Form</td>
<td>Crystals</td>
<td></td>
</tr>
<tr>
<td>Color</td>
<td>Colorless</td>
<td></td>
</tr>
<tr>
<td>Molecular Weight</td>
<td>76.05 AMU</td>
<td></td>
</tr>
<tr>
<td>pH</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>20 °C Concentration: 50 g/l</td>
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<td></td>
</tr>
<tr>
<td>BP/BP Range</td>
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</tr>
<tr>
<td>MP/MP Range</td>
<td>75 °C</td>
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</tr>
<tr>
<td>Freezing Point</td>
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<tr>
<td>Vapor Pressure</td>
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</tr>
<tr>
<td>80 °C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vapor Density</td>
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<tr>
<td>Saturated Vapor Conc.</td>
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</tr>
<tr>
<td>SG/Density</td>
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</tr>
<tr>
<td>Bulk Density</td>
<td>0.6 kg/l</td>
<td></td>
</tr>
<tr>
<td>Odor Threshold</td>
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<td></td>
</tr>
<tr>
<td>Volatile%</td>
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<td></td>
</tr>
<tr>
<td>VOC Content</td>
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<td></td>
</tr>
<tr>
<td>Water Content</td>
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</tr>
<tr>
<td>Solvent Content</td>
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<td></td>
</tr>
<tr>
<td>Evaporation Rate</td>
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<td></td>
</tr>
<tr>
<td>Viscosity</td>
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<td></td>
</tr>
<tr>
<td>Surface Tension</td>
<td>N/A</td>
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</tr>
<tr>
<td>Partition Coefficient</td>
<td>Log Kow: -1.110</td>
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</tr>
<tr>
<td>Decomposition Temp.</td>
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</tr>
<tr>
<td>Flash Point</td>
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</tr>
<tr>
<td>Explosion Limits</td>
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</tr>
<tr>
<td>Flammability</td>
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</tr>
<tr>
<td>Autoignition Temp</td>
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<td></td>
</tr>
<tr>
<td>Refractive Index</td>
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</tr>
<tr>
<td>Optical Rotation</td>
<td>N/A</td>
<td></td>
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<tr>
<td>Miscellaneous Data</td>
<td>N/A</td>
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</tr>
<tr>
<td>Solubility</td>
<td>Solvent: 0.1 g/ml H2O Clear</td>
<td></td>
</tr>
</tbody>
</table>

N/A = not available

Section 10 - Stability and Reactivity

STABILITY
Materials to Avoid: Bases, Oxidizing agents, Reducing agents.

HAZARDOUS DECOMPOSITION PRODUCTS
Hazardous Decomposition Products: Carbon monoxide, Carbon dioxide.

HAZARDOUS POLYMERIZATION
Hazardous Polymerization: Will not occur

Section 11 - Toxicological Information
ROUTE OF EXPOSURE
Skin Contact: Causes burns.
Skin Absorption: May be harmful if absorbed through the skin.
Eye Contact: Causes burns.
Inhalation: Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract. May be harmful if inhaled.
Ingestion: Harmful if swallowed.

SENSITIZATION
Sensitization: Will not occur

SIGNS AND SYMPTOMS OF EXPOSURE
Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin.
Inhalation may result in spasm, inflammation and edema of the larynx and bronchi, chemical pneumonitis, and pulmonary edema. Symptoms of exposure may include burning sensation, coughing, wheezing, laryngitis, shortness of breath, headache, nausea, and vomiting.

TOXICITY DATA

Oral
Rat
1950 mg/kg
LD50

Inhalation
Rat
7,100 mg/m3
LC50

Intravenous
Cat
1 GM/KG
LD50

Oral
Guinea pig
1920 mg/kg
LD50

IRRITATION DATA

Eyes
Rabbit
Remarks: Severe irritation effect

Skin
Rabbit
Remarks: Severe irritation effect
Eyes
Rabbit
2 mg
Remarks: Severe irritation effect

CHRONIC EXPOSURE - REPRODUCTIVE HAZARD

Species: Rat
Dose: 9 GM/KG
Route of Application: Oral
Exposure Time: (7-12D PREG)
Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus). Maternal Effects: Other effects. Specific Developmental Abnormalities: Musculoskeletal system.

Species: Rat
Dose: 7500 MG/KG
Route of Application: Oral
Exposure Time: (7-21D PREG)
Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus). Specific Developmental Abnormalities: Musculoskeletal system. Maternal Effects: Other effects.

Species: Rat
Dose: 9 G/KG
Route of Application: Oral
Exposure Time: (7-21D PREG)
Result: Maternal Effects: Other effects. Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus). Specific Developmental Abnormalities: Musculoskeletal system.

Section 12 - Ecological Information

ACUTE ECOTOXICITY TESTS

Test Type: LC50 Fish
Species: Brachydanio rerio
Time: 96 h
Value: 5,000 mg/l

ADDITIONAL RESULTS/DATA FROM RELEVANT SCIENTIFIC EXPERIMENTS
Avoid contamination of the environment. May be harmful to aquatic organisms due to the shift of the pH.

Section 13 - Disposal Considerations

APPROPRIATE METHOD OF DISPOSAL OF SUBSTANCE OR PREPARATION
Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber. Observe all federal, state, and local environmental regulations.

Section 14 - Transport Information

DOT
Proper Shipping Name: Corrosive solid, acidic, organic, n.o.s.
UN#: 3261
Class: 8
Packing Group: Packing Group II
Hazard Label: Corrosive
IATA
Proper Shipping Name: Corrosive solid, acidic, organic, n.o.s.
IATA UN Number: 3261
Hazard Class: 8
Packing Group: II

Section 15 - Regulatory Information

EU ADDITIONAL CLASSIFICATION
Symbol of Danger: C
Indication of Danger: Corrosive.
R: 22-34
Risk Statements: Harmful if swallowed. Causes burns.
S: 26-36/37/39-45
Safety Statements: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear suitable protective clothing, gloves, and eye/face protection. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

US CLASSIFICATION AND LABEL TEXT
Indication of Danger: Corrosive.
Risk Statements: Causes burns. Harmful if swallowed.
Safety Statements: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear suitable protective clothing, gloves, and eye/face protection. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

UNITED STATES REGULATORY INFORMATION
SARA LISTED: No
TSCA INVENTORY ITEM: Yes

CANADA REGULATORY INFORMATION
WHMIS Classification: This product has been classified in accordance with the hazard criteria of the CPR, and the MSDS contains all the information required by the CPR.
DSL: Yes
NDSL: No

Section 16 - Other Information

DISCLAIMER
For R&D use only. Not for drug, household or other uses.

WARRANTY
The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Inc., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale.
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