

Material Safety Data for: Glycerol

1. PRODUCT IDENTIFICATION

Name 1,1,1-trihydroxypropane
Synonyms glycerol, 1,2,3-propanetriol, glyceryl alcohol, (glycerin(e) – *no longer used*)
CAS# 56-81-5
Product Uses resins, gums, inks, pharmaceuticals, lotions; humectant

2. INGREDIENTS

| | % | TWAEV / TLV mg/m ³ | LD ₅₀ ORAL | (mg/kg) SKIN | LC ₅₀ ppm INHALATION |
|-------------------------|------|----------------------------------|--------------------------|-----------------|------------------------------------|
| 1,2,3-trihydroxypropane | 100% | 2.7 / 10 | 4090 | >10,000 | 150 |

3. (a) HAZARDS SUMMARY

Hazards, Quick Guide: combustible in a fire; hot liquid may cause burns; spills may be slippery

Canada – WHMIS
Key:

not controlled under WHMIS

B 2 – Flash Point <38°C, B 3 – Flash Point >38°C & <93°C

D 1 – Immediately Toxic, D 2 – Chronic Toxicity

C – Oxidising Substance, E – Corrosive

U.S.A. – HMIS
Key:

Health – 0, Fire – 0/1, Reactivity – 0

0=minimal, 1=slight, 2=moderate, 3=serious, 4=severe

3. (b) HAZARDS – TOXICITY

Effects, Acute Exposure

Skin Contact little to no effect (may soften skin)
 Skin Absorption slight; no toxic effects possible by this route
 Eye Contact may be slightly irritating
 Inhalation mist may be slightly irritating – *very low vapour pressure makes vapour unlikely; high viscosity makes mist production difficult*
 Ingestion little to no effect; very large doses (~½ litre) may damage red cells causing bloody urine; resolves rapidly as glycerol is eliminated from the body within 2-3 hours

Effects, Chronic Exposure

General little to no effect
 Sensitising not a sensitiser in humans or animals
 Carcinogen/Tumorigen not considered a tumorigen or a carcinogen in humans or animals
 Reproductive Effect no known effect in humans or animals
 Mutagen no known effect on humans or animals
 Synergistic With not known
 LD₅₀ (oral) 12,600 & 27,000mg/kg (rat), 4090 & 23,000mg/kg (mouse), 7750mg/kg (guinea pig), 27,000mg/kg (rabbit)
 LD₅₀ (skin) above 10,000 & 23,000mg/kg (rabbit)
 LC₅₀ (inhalation) 38ppm/143mg/m³ (rat)

Please ensure that this MSDS is given to, and explained to people using this product.

4. FIRST AID

- SKIN: Wash with plenty of water. Remove contaminated clothing and do not reuse until thoroughly laundered.
- EYES: Wash eyes with plenty of water, holding eyelids open. Seek medical assistance promptly if there is irritation.
- INHALATION: Remove from contaminated area promptly. **CAUTION: Rescuer must not endanger himself!** If breathing stops, administer artificial respiration and seek medical aid promptly.
- INGESTION: Give plenty of water to dilute product. Do not induce vomiting (NOTE below). Keep victim quiet. If vomiting occurs, lower victim's head below hips to prevent inhalation of vomited material. Seek medical help promptly.

Inadvertent inhalation of vomited material may seriously damage the lungs. The danger of this is greater than the risk of poisoning through absorption of this relatively low-toxicity substance. The stomach should only be emptied under medical supervision, and after the installation of an airway to protect the lungs.

5. PHYSICAL PROPERTIES

| | |
|---|---|
| Odour & Appearance | clear, colourless, odourless, syrupy, hygroscopic liquid with sweet taste |
| Odour Threshold | not known – odourless |
| Vapour Pressure | 0.0023mmHg / 0.00031kPa (20°C / 68°F) |
| Evaporation Rate (<i>Butyl Acetate = 1</i>) | not considered volatile |
| Vapour Density (air = 1) | 3.2 |
| Boiling Range | decomposes without boiling above 290°C / 554°F |
| Freezing Point | 18°C / 64°F – <i>super cools readily when pure; may not freeze until cooled to 0°C / 32°F</i> |
| Specific Gravity | 1.264 (20/20°C) |
| Water Solubility | complete |
| Also soluble in | alcohols, glycols; insoluble in hydrocarbons, chlorinated hydrocarbons and ethers |
| Viscosity | 1490centipoise (20°C / 68°F) |
| pH | none – (<i>does not liberate hydrogen ions when dissolved</i>) |
| Conversion Factor | 1ppm = 3.76mg/m ³ |
| Molecular Weight | 92grams per mole |

6. FLAMMABILITY & FIRE FIGHTING

| | |
|----------------------------|--|
| Flash Point | 199°C / 390°F (closed cup) |
| Autoignition Temperature | 370°C / 698°F |
| Flammable Limits | not known |
| Combustion Products | carbon monoxide, nitrogen oxides, smoke, part oxidised hydrocarbon fragments |
| Fire Fighting Precautions | alcohol foam best, dry chemical, water fog/spray; fire fighters must wear SCBA |
| Static Charge Accumulation | cannot accumulate a static charge on agitation or pumping |

7. STABILITY / REACTIVITY

| | |
|---|---|
| Dangerously Reactive With permanganate) | strong oxidising agents (chromium trioxide, potassium chlorate, or potassium permanganate) |
| Also Reactive With | may cause explosion |
| Stability | none known |
| Decomposes in Presence of | stable; may polymerize above 150°C / 300°F – <i>not known if this reaction is hazardous</i> |
| Decomposition Products | heat above 290°C / 554°F |
| Sensitive to Mechanical Impact | toxic acrolein fumes on thermal decomposition |
| | no |

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8. PROTECTIVE EQUIPMENT / EXPOSURE CONTROL

| | |
|-------------|---|
| ACGIH TLV | 2.7ppm / 10mg/m ³ |
| OSHA PEL | 2.7ppm / 10mg/m ³ |
| STEL | 4ppm / 15mg/m ³ |
| Ventilation | mechanical ventilation may be required to control airborne concentration if a mist is generated |
| Hands | no special protective glove required |
| Eyes | safety glasses with side shields – <i>always protect the eyes</i> |
| Clothing | no special protective clothing required |

9. HANDLING & STORAGE

This product absorbs moisture from the air. Store in a dry environment, away from oxidising agents. Always ensure that containers, whether empty or full, or part full, are tightly sealed unless in use.

Avoid breathing product mist. Use with adequate ventilation.

Never cut, drill, weld or grind on or near this container. Avoid contact with skin and wash work clothes frequently. An eye bath and safety shower must be available near the workplace.

NOTE: Glycerol is very sweet (60% sweetness of sugar). Keep away from children and animals.

10. SPILL PROCEDURES

| | |
|-----------------|---|
| Leak Precaution | dyke to control spillage and prevent environmental contamination |
| Handling Spill | ventilate contaminated area; recover free liquid with suitable pumps; absorb residue on an inert sorbent, sweep, shovel, & store in closed containers for recycling or disposal |

11. DISPOSAL

| | |
|----------------|--|
| Waste Disposal | do not flush to sewer , recycle solvent if possible, if local regulations permit, may be put in sanitary landfill, may be incinerated in approved facility after mixing with a suitable flammable waste |
| Containers | Drums should be reused. Recondition and pressure test by a licensed reconditioner prior to re-use. Pails must be vented and thoroughly dried prior to crushing and recycling. IBCs (intermediate bulk containers): polyethylene bottle must be pressure tested & recertified at 30 months. Replace at 60 months (5yrs). Steel containers must be inspected, pressure tested & recertified every 5 years. <i>Never cut, drill, weld or grind on or near this container, even if empty</i> |

12. ENVIRONMENTAL INFORMATION

| | |
|------------------------------------|---|
| Bioaccumulation | this product is readily metabolised and cannot bioaccumulate |
| Biodegradation | this product degrades readily and rapidly in the presence of oxygen; well over 50% degradation in 5 days has been reported in several studies |
| Abiotic Degradation | this product reacts with atmospheric hydroxyl radicals; its estimated half-life in air is 33 hours |
| Mobility in soil, water | this product is water soluble and will move readily in soil and water |
| Aquatic Toxicity | |
| LC ₅₀ (Fish, 48hr) | >10,000mg/litre (leuciscus idus & idus idus) – <i>virtually non-toxic</i> |
| EC ₅₀ (Crustacea, 48hr) | >10,000mg/litre (daphnia magna) – <i>virtually non-toxic</i> |

Other test results show very little effect – EC₃, the toxicity threshold – on bacteria, amoeba, etc, even at a 10,000mg/litre dose. Glycerol has very low toxicity to aquatic life.

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13. TRANSPORT REGULATIONS

| | | |
|-------------------------|----------------------|------------------------------------|
| Canada TDG | PIN | not regulated for transport |
| AND | Shipping Name | not regulated for transport |
| U.S.A. 49 CFR | Class | not regulated for transport |
| | Packing Group | not regulated for transport |
| Marine Pollutant | | not a marine pollutant |

14. EMERGENCY INFORMATION

| | | |
|---------------|-------------------------------|-----------------------|
| Canada | Call CANUTEC (collect) | (613) 996-6666 |
| U.S.A. | Call CHEMTREC | (800) 424-9300 |

15. REGULATIONS

| | |
|----------------------|-------------------------------------|
| Canada DSL | on inventory |
| U.S.A. TSCA | on inventory |
| Europe EINECS | on inventory (EC# 200-289-5) |

Allowable Tolerances: Residues of glycerol are exempted from the requirement of a tolerance when used as a thickener in accordance with good agricultural practices as inert (or occasionally active) ingredients in pesticide formulations applied to growing crops or to raw agricultural commodities after harvest. Glycerol (glycerin) is exempted from the requirement of a tolerance when used as a solvent and thickener, and meeting specifications of Food Chemical Codex, in accordance with good agricultural practice as inert (or occasionally active) ingredients in pesticide formulations applied to animals.

OSHA Standards: Permissible Exposure Limit: Table Z-1 8-hr Time Weighted Avg: 15 mg/cu m. /Mist, total dust/ Permissible Exposure Limit: Table Z-1 8-hr Time Weighted Avg: 5 mg/cu m. /Mist, respirable fraction/ Vacated 1989 OSHA PEL TWA 10 mg/cu m is still enforced in some states. /Mist, total/ Vacated 1989 OSHA PEL TWA 5 mg/cu m is still enforced in some states. /Mist, resp/

NIOSH Recommendations: NIOSH concluded that the documentation cited by OSHA was inadequate to support the proposed PEL (as an 8 hour TWA) of 10 mg/cu m for glycerine (mist).

Threshold Limit Values: 8 hr Time Weighted Avg (TWA): 10 mg/cu m. /Glycerin mist/ Excursion Limit Recommendation: Excursions in worker exposure levels may exceed 3 times the TLV-TWA for no more than a total of 30 minutes during a work day, and under no circumstances should they exceed 5 times the TLV-TWA, provided that the TLV-TWA is not exceeded. /Glycerin mist/

Atmospheric Standards: This action promulgates standards of performance for equipment leaks of Volatile Organic Compounds (VOC) in the Synthetic Organic Chemical Manufacturing Industry (SOCMI). The intended effect of these standards is to require all newly constructed, modified, and reconstructed SOCMI process units to use the best demonstrated system of continuous emission reduction for equipment leaks of VOC, considering costs, non air quality health and environmental impact and energy requirements. Glycerol is produced, as an intermediate or a final product, by process units covered under this subpart.

FIFRA Requirements: As the federal pesticide law FIFRA directs, EPA is conducting a comprehensive review of older pesticides to consider their health and environmental effects and make decisions about their future use. Under this pesticide reregistration program, EPA examines health and safety data for pesticide active ingredients initially registered before November 1, 1984, and determines whether they are eligible for reregistration. In addition, all pesticides must meet the new safety standard of the Food Quality Protection Act of 1996. Pesticides for which EPA had not issued Registration Standards prior to the effective date of FIFRA, as amended in 1988, were divided into three lists based upon their potential for human exposure and other factors, with List B containing pesticides of greater concern and List D pesticides of less concern. Glycerol is found on List D. Case No: 4044; Case Status: No products containing the pesticide are actively registered ... The case /is characterized/ as "cancelled." Under FIFRA, pesticide producers may voluntarily cancel their registered products. EPA also may cancel pesticide registrations if registrants fail to pay required fees or make/meet certain reregistration commitments, or if EPA reaches findings of unreasonable adverse effects.; Active ingredient (AI): Glycerol; AI Status: The active ingredient is no longer contained in any registered pesticide products ... "cancelled." Residues of GLYCEROL are exempted from the requirement of a tolerance when used as a thickener in accordance with good agricultural practices as inert (or occasionally active) ingredients in pesticide formulations applied to growing crops or to raw agricultural commodities after harvest. GLYCEROL (glycerin) is exempted from the requirement of a tolerance when used as a solvent and thickener, and meeting specifications of Food Chemical Codex, in accordance with good agricultural practice as inert (or occasionally active) ingredients in pesticide formulations applied to animals.

FDA Requirements: GLYCEROL used as a multiple purpose GRAS food substance in food for human consumption is *generally recognized as safe* when used in accordance with good manufacturing practice. GLYCEROL used as a general purpose food additive in animal drugs, feeds, and related products is generally recognized as safe when used in accordance with good manufacturing or feeding practice.

16. PREPARATION INFORMATION

Prepared for Megaloid Laboratories by Peter Bursztyn, (705) 734-1577

File Name: glycerol

With data from RTECS, Haz. Substance Data Base, Cheminfo (CCOHS), IUCLID Datasheets (European Chem. Substance Info. System), & others, as available

Preparation Date: **October 2006** Revision Date: **October 2009**

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