

# Material Safety Data for: Propionic Acid

## 1. PRODUCT IDENTIFICATION

|                     |   |
|---------------------|---|
| <b>Name</b>         | propionic acid  |
| <b>Synonyms</b>     | methyl acetic acid, ethane carboxylic acid & others                           |
| <b>CAS#</b>         | 79-09-4   |
| <b>EC#</b>          | 201-176-3   |
| <b>Product Uses</b> | antimicrobial agent in foods; animal feed preservative; flavourings, & others |

## 2. INGREDIENTS

|                | %    | TWAEV / TLV<br>mg/m <sup>3</sup> | LD <sub>50</sub><br>ORAL | (mg/kg)<br>SKIN | LC <sub>50</sub> ppm<br>INHALATION |
|----------------|------|----------------------------------|--------------------------|-----------------|------------------------------------|
| Propionic Acid | 100% | 10 / 30                          | 2600                     | 500             | 5400                               |

## 3. (a) HAZARDS SUMMARY

**Hazards, Quick Guide:** flammable; skin and eyes & other tissues; absorbed through the skin; corrosive to common metals

### Canada – WHMIS

Key:

### B 3, D 1B, E

*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 – 1/2, Fire – 2, Reactivity – 0

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

## 3. (b) HAZARDS – TOXICITY

### Effects, Acute Exposure

|                 |  |
|-----------------|--|
| Skin Contact    | irritating; corrosive at high concentration if not washed promptly   |
| Skin Absorption | yes; toxic effects may occur by this route; <i>sufficiently irritating/corrosive that the prolonged contact necessary for absorption of a toxic amount is unlikely</i> |
| Eye Contact     | corrosive even at 5%   |
| Inhalation      | vapour or mist irritating; coughing, hoarse voice, possible difficult breathing  |
| Ingestion       | irritating, possibly corrosive to mouth, throat & stomach – not a route of industrial exposure   |

### Effects, Chronic Exposure

|                               |   |
|-------------------------------|---|
| General                       | no information – prolonged exposure to dilute product may cause dermatitis                          |
| Sensitising                   | not a sensitiser in humans or animals   |
| Carcinogen/Tumorigen          | not considered a tumorigen or a carcinogen in humans or animals; <i>pre-cancerous lesions occur</i> |
| Reproductive Effect           | <i>in stomachs of rats fed 4% propionic acid for 2 years (not relevant to industrial exposure)</i>  |
| Mutagen                       | no known effect in humans or animals  |
| Synergistic With              | no known effect on humans or animals  |
| LD <sub>50</sub> (oral)       | not known   |
| LD <sub>50</sub> (skin)       | 2600-6400mg/kg (rat), 2350-2900 & 5100mg/kg (mouse), 695mg/kg (rabbit)                              |
| LC <sub>50</sub> (inhalation) | 500-795mg/kg (rabbit), 5000-10,000mg/kg (guinea pig)  |
|                               | 5400mg/m <sup>3</sup> (rat)   |

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**(Propionic Acid, cont'd)**

**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, oily liquid with pungent rancid odour |
| Odour Threshold                               | 0.07ppm (variable)                                       |
| Vapour Pressure                               | 3mmHg / 0.4kPa (20°C / 68°F)                             |
| Evaporation Rate ( <i>Butyl Acetate = 1</i> ) | not known – <i>close to that of xylene</i>               |
| Vapour Density (air = 1)                      | 2.5  |
| Boiling Range                                 | 141°C / 286°F  |
| Melting Point                                 | -21°C / -5°F   |
| Specific Gravity                              | 0.993 (20/20°C)  |
| Water Solubility                              | complete   |
| Also soluble in                               | ethanol, diethyl ether, chloroform                       |
| Viscosity                                     | 1.1centipoise (25°C / 77°F)                              |
| pH  | 2.9 (0.1molar sol'n); 2.0 (55% sol'n)                    |
| Conversion Factor                             | 1ppm = 3.02mg/m <sup>3</sup>                             |
| Molecular Weight                              | 74grams per mole   |

**6. FLAMMABILITY & FIRE FIGHTING**

|                            |  |
|----------------------------|--|
| Flash Point                | 52°C / 126°F (closed cup)  |
| Autoignition Temperature   | 466°C / 870°F  |
| Flammable Limits           | 2.9% – 12.1%   |
| Combustion Products        | carbon monoxide, nitrogen oxides, acrid smoke, part oxidised hydrocarbon fragments           |
| Fire Fighting Precautions  | foam, dry chemical, CO <sub>2</sub> , water fog or spray; fire fighters must wear SCBA       |
| Static Charge Accumulation | may accumulate a static charge on agitation or pumping; <i>high flash point reduces risk</i> |

**7. STABILITY / REACTIVITY**

|                                |  |
|--------------------------------|--|
| Dangerously Reactive With      | strong oxidising agents; strong alkalies   |
| Also Reactive With             | aluminum or zinc cause release of hydrogen gas; corrosive to iron, steel, nickel; corrosive to aluminum when slightly dilute; not corrosive to copper and alloys |
| Stability                      | stable; will not polymerize  |
| Decomposes in Presence of      | not known  |
| Decomposition Products         | none apart from Hazardous Combustion Products  |
| Sensitive to Mechanical Impact | no   |

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## 8. PROTECTIVE EQUIPMENT / EXPOSURE CONTROL

|             |   |
|-------------|---|
| ACGIH TLV   | 10ppm / 30mg/m <sup>3</sup>   |
| OSHA PEL    | 10ppm / 30mg/m <sup>3</sup>   |
| STEL        | 15ppm / 45mg/m <sup>3</sup>   |
| Ventilation | mechanical ventilation may be required to maintain airborne titre below required limits     |
| Hands       | “Responder” or “Tychem” gloves recommended – <i>consult supplier to confirm suitability</i> |
| Eyes        | safety glasses with side shields – <i>always protect the eyes</i>                           |
| Clothing    | wear impermeable (above) apron, boots, & long sleeves if there is any danger of splashing,  |

## 9. HANDLING & STORAGE

Store in a cool, dry environment, away from sources of ignition, heat and substances listed in Part 7. Always ensure that containers, whether empty or full, or part full, are tightly sealed unless in use.

Avoid breathing product vapour or mist. Use with adequate ventilation. If dealing with a spill, and ventilation is impossible or impractical, wear a suitable respirator with organic vapour / acid gas cartridge. Corrosive to many metals.

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

## 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 & pick up using plastic or aluminium shovel, & store in closed containers for recycling or disposal |

## 11. DISPOSAL

|                |  |
|----------------|--|
| Waste Disposal | <b>do not flush to sewer</b> , recycle if possible, if local regulations permit, may be put in sanitary landfill, may be incinerated in approved facility; decomposes readily in sewage treatment facility   |
| Containers     | <b>Drums</b> should be reused. Recondition and pressure test by a licensed reconditioner prior to re-use.<br><b>Pails</b> must be vented and thoroughly dried prior to crushing and recycling.<br><b>IBCs</b> (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.<br><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 by living matter and cannot bioaccumulate                              |
| Biodegradation                     | this product degrades readily and rapidly in the presence of oxygen; 23-71% in 5 days                      |
| Abiotic Degradation                | this product reacts with atmospheric hydroxyl radicals; its estimated half-life in air is 13 days          |
| Mobility in soil, water            | this product is water soluble and will move readily in soil and water                                      |
| <b>Aquatic Toxicity</b>            |  |
| LC <sub>50</sub> (Fish, 96hr)      | 4740mg/litre (pimephelas promelas), 85 & 115mg/litre (Iepomis macrochirus), 67mg/litre (oncorhynus mykiss) |
| EC <sub>50</sub> (Crustacea, 24hr) | 130mg/litre (daphnia magna)  |
| EC <sub>50</sub> (Algae, 96hr)     | 43mg/litre (scenedesmus subspicatus)   |
| EC <sub>50</sub> (Bacteria)        | 60mg/litre (pseudomonas putida)  |

## 13. TRANSPORT REGULATIONS

|                         |                      |                               |
|-------------------------|----------------------|-------------------------------|
| <b>Canada TDG</b>       | <b>PIN</b>           | <b>UN-1848</b>                |
| <b>AND</b>              | <b>Shipping Name</b> | <b>propionic acid</b>         |
| <b>U.S.A. 49 CFR</b>    | <b>Class</b>         | <b>8</b>                      |
|                         | <b>Packing Group</b> | <b>III</b>                    |
| <b>Marine Pollutant</b> |                      | <b>not a marine pollutant</b> |

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### 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# 201-176-3)

**Allowable Tolerances:** Postharvest application of propanoic acid or a mixture of methylene bispropionate and oxy(bismethylene) bispropionate when used as a fungicide is exempted from the requirement of a tolerance for residues in or on the following raw agricultural commodities: Alfalfa, barley grain, Bermuda grass, bluegrass, brome grass, clover, corn grain, cowpea hay, fescue, lespedeza, lupines, oat grain, orchard grass, peanut hay, peavine hay, rye grass, sorghum grain, soybean hay, sudan grass, timothy, vetch, and wheat grain. Propanoic acid is exempt from the requirement of a tolerance for residues in or on meat and meat byproducts of cattle, sheep, hogs, goats, horses, and poultry, milk, and eggs when applied as a bactericide/fungicide to livestock drinking water, poultry litter, and storage areas for silage and grain. Preharvest and postharvest application of propanoic acid (CAS Reg. No. 79-09-4), propanoic acid, calcium salt (CAS Reg. No. 4075-81-4), and propanoic sodium salt (CAS Reg. No. 137-40-6) are exempted from the requirement of a tolerance on all crops when used as either an active or inert ingredient in accordance with good agricultural practice in pesticide formulations applied to growing crops, to raw agricultural commodities before and after harvest and to animals.

**OSHA Standards:** Vacated 1989 OSHA PEL TWA 10 ppm (30 mg/cu m) is still enforced in some states.

**NIOSH Recommendations:** Recommended Exposure Limit: 10 Hr Time-Weighted Avg: 10 ppm (30 mg/cu m). Recommended Exposure Limit: 15 Min Short-Term Exposure Limit: 15 ppm (45 mg/cu m).

**Threshold Limit Values:** 8 hr Time Weighted Avg (TWA): 10 ppm. 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.

**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. Propionic acid is produced, as an intermediate or a final product, by process units covered under this subpart.

**Clean Water Act Requirements:** Propionic acid is designated as a hazardous substance under section 311(b)(2)(A) of the Federal Water Pollution Control Act and further regulated by the Clean Water Act Amendments of 1977 and 1978. These regulations apply to discharges of this substance. This designation includes any isomers and hydrates, as well as any solutions and mixtures containing this substance.

**CERCLA Reportable Quantities:** Persons in charge of vessels or facilities are required to notify the National Response Center (NRC) immediately, when there is a release of this designated hazardous substance, in an amount equal to or greater than its reportable quantity of 5000 lb or 2270 kg. The toll free number of the NRC is (800) 424-8802. The rule for determining when notification is required is stated in 40 CFR 302.4 (section IV. D.3.b).

**FIFRA Requirements:** Postharvest application of propanoic acid or a mixture of methylene bispropionate and oxy(bismethylene) bispropionate when used as a fungicide is exempted from the requirement of a tolerance for residues in or on the following raw agricultural commodities: alfalfa, barley grain, Bermuda grass, bluegrass, brome grass, clover, corn grain, cowpea hay, fescue, lespedeza, lupines, oat grain, orchard grass, peanut hay, peavine hay, rye grass, sorghum grain, soybean hay, sudan grass, timothy, vetch, and wheat grain. Propanoic acid is exempt from the requirement of a tolerance for residues in or on meat and meat byproducts of cattle, sheep, hogs, goats, horses, and poultry, milk, and eggs when applied as a bactericide/fungicide to livestock drinking water, poultry litter, and storage areas for silage and grain. Preharvest and postharvest application of propanoic acid (CAS Reg. No. 79-09-4), propanoic acid, calcium salt (CAS Reg. No. 4075-81-4), and propanoic sodium salt (CAS Reg. No. 137-40-6) are exempted from the requirement of a tolerance on all crops when used as either an active or inert ingredient in accordance with good agricultural practice in pesticide formulations applied to growing crops, to raw agricultural commodities before and after harvest and to animals. Based on the reviews of the generic data for the active ingredient propanoic acid, the products containing this active ingredient are eligible for reregistration. Section 4(g)(2)(B) of FIFRA calls for the EPA to obtain any needed product-specific data regarding the pesticide after a determination of eligibility has been made. The EPA will review these data when they have been submitted and/or cited and determine whether to reregister individual products. As the federal pesticide law FIFRA direct, 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 88 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. Propionic acid is found on List D. Case No: 4078; Case Status: RED Approved 09/91 - OPP has made a decision that some/all uses of the pesticide are eligible for reregistration, as reflected in a Reregistration Eligibility Decision (RED) Document. Active ingredient (AI): Propionic acid; AI Status: RED Completed - OPP has completed a Reregistration Eligibility Decision (RED) document for the case/AI.

**FDA Requirements:** Substance added directly to human food affirmed as **generally recognized as safe**. Propionic acid used as a chemical preservative in animal drugs, feeds, and related products is generally recognized as safe when used in accordance with good manufacturing or feeding practice. Drug products containing certain active ingredients offered over-the-counter (OTC) for certain uses. A number of active ingredients have been present in OTC drug products for various uses, as described below. However, based on evidence currently available, there are inadequate data to establish general recognition of the safety and effectiveness of these ingredients for the specified uses: propionic acid is included in topical antifungal drug products.

### 16. PREPARATION INFORMATION

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

File Name: **propionic**

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

Preparation Date: **September 2006** Revision Date: **September 2009**

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