SECTION 1 IDENTIFICATION OF THE SUBSTANCE / MIXTURE AND OF THE COMPANY / UNDERTAKING

Product Identifier

<table>
<thead>
<tr>
<th>Product name</th>
<th>LACTIC ACID</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical Name</td>
<td>lactic acid</td>
</tr>
<tr>
<td>Synonyms</td>
<td>C3-H6-O3, L-(+)-lactic acid (CAS RN: 79-33-4), (S)-2-hydroxypropionic acid, sarcioic acid, (D)-(−)-lactic acid (CAS RN: 10326-41-7), DL-lactic acid (CAS RNs: 50-21-5; 598-82-3), acetic acid, milk acid, Food Acid 270 Food Additive 270, ethylenelactic acid, 1-hydroxypente carboxylic acid, 2-hydroxypropionic acid, 2-hydroxypropionic acid, alpha-hydroxypropionic acid, propanic acid, 2-hydroxypropionic acid, 2-hydroxypropionic acid, racemic lactic acid DL-lactic, for L-(−)-lactic acid, paralactic acid, lactol, Merck 10138, Purac PH-90</td>
</tr>
<tr>
<td>Proper shipping name</td>
<td>CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (contains lactic acid)</td>
</tr>
<tr>
<td>Chemical formula</td>
<td>C3-H6-O3</td>
</tr>
<tr>
<td>Other means of identification</td>
<td>Not Available</td>
</tr>
<tr>
<td>CAS number</td>
<td>50-21-5</td>
</tr>
</tbody>
</table>

Relevant identified uses of the substance or mixture and uses advised against

| Relevant identified uses | Cultured dairy products, as an acidulant additive in foods, manufacture of lactate chemicals (salts, plasticizers, adhesives, pharmaceuticals), mordant in dyeing wool, Laboratory reagent. |

Details of the supplier of the safety data sheet

<table>
<thead>
<tr>
<th>Registered company name</th>
<th>Bio-Strategy Pty Ltd</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address</td>
<td>Unit 1A/60 Enterprise Place QLD 4173 Australia</td>
</tr>
<tr>
<td>Telephone</td>
<td>1300 727 696</td>
</tr>
<tr>
<td>Fax</td>
<td>Not Available</td>
</tr>
<tr>
<td>Website</td>
<td><a href="http://www.bio-strategy.com.au">www.bio-strategy.com.au</a></td>
</tr>
<tr>
<td>Email</td>
<td><a href="mailto:csaus@bio-strategy.com">csaus@bio-strategy.com</a></td>
</tr>
</tbody>
</table>

Emergency telephone number

<table>
<thead>
<tr>
<th>Association / Organisation</th>
<th>Not Available</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emergency telephone numbers</td>
<td>07 3009 4188</td>
</tr>
<tr>
<td>Other emergency telephone numbers</td>
<td>Not Available</td>
</tr>
</tbody>
</table>

SECTION 2 HAZARDS IDENTIFICATION

Classification of the substance or mixture

<table>
<thead>
<tr>
<th>Poisons Schedule</th>
<th>Not Applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classification [1]</td>
<td>Metal Corrosion Category 1, Skin Corrosion/Irritation Category 1B, Serious Eye Damage Category 1</td>
</tr>
</tbody>
</table>

*LIMITED EVIDENCE


Label elements

<table>
<thead>
<tr>
<th>Hazard pictogram(s)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>SIGNAL WORD</td>
<td>DANGER</td>
</tr>
</tbody>
</table>
Hazard statement(s)

<table>
<thead>
<tr>
<th>Hazard Statement</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>H290</td>
<td>May be corrosive to metals.</td>
</tr>
<tr>
<td>H314</td>
<td>Causes severe skin burns and eye damage.</td>
</tr>
</tbody>
</table>

*LIMITED EVIDENCE

Supplementary statement(s)

Not Applicable

Precautionary statement(s) Prevention

<table>
<thead>
<tr>
<th>Precautionary Statement</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>P260</td>
<td>Do not breathe dust/fume/gas/mist/vapours/spray.</td>
</tr>
<tr>
<td>P280</td>
<td>Wear protective gloves/protective clothing/eye protection/face protection.</td>
</tr>
<tr>
<td>P234</td>
<td>Keep only in original container.</td>
</tr>
</tbody>
</table>

Precautionary statement(s) Response

<table>
<thead>
<tr>
<th>Precautionary Statement</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>P301+P330+P331</td>
<td>IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.</td>
</tr>
<tr>
<td>P303+P361+P353</td>
<td>IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/shower.</td>
</tr>
<tr>
<td>P305+P351+P338</td>
<td>IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.</td>
</tr>
<tr>
<td>P310</td>
<td>Immediately call a POISON CENTER or doctor/physician.</td>
</tr>
</tbody>
</table>

Precautionary statement(s) Storage

<table>
<thead>
<tr>
<th>Precautionary Statement</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>P405</td>
<td>Store locked up.</td>
</tr>
</tbody>
</table>

Precautionary statement(s) Disposal

<table>
<thead>
<tr>
<th>Precautionary Statement</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>P501</td>
<td>Dispose of contents/container in accordance with local regulations.</td>
</tr>
</tbody>
</table>

SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS No</th>
<th>% [Weight]</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>lactic acid</td>
<td>50-21-5</td>
<td>&gt;=85</td>
<td></td>
</tr>
</tbody>
</table>

Mixtures

See section above for composition of Substances

SECTION 4 FIRST AID MEASURES

Description of first aid measures

<table>
<thead>
<tr>
<th>Eye Contact</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>If this product comes in contact with the eyes:</td>
<td></td>
</tr>
<tr>
<td>Immediately hold eyelids apart and flush the eye continuously with running water.</td>
<td></td>
</tr>
<tr>
<td>Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.</td>
<td></td>
</tr>
<tr>
<td>Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes.</td>
<td></td>
</tr>
<tr>
<td>Transport to hospital or doctor without delay.</td>
<td></td>
</tr>
<tr>
<td>Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Skin Contact</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>If skin or hair contact occurs:</td>
<td></td>
</tr>
<tr>
<td>Immediately flush body and clothes with large amounts of water, using safety shower if available.</td>
<td></td>
</tr>
<tr>
<td>Quickly remove all contaminated clothing, including footwear.</td>
<td></td>
</tr>
<tr>
<td>Wash skin and hair with running water. Continue flushing with water until advised to stop by the Poisons Information Centre.</td>
<td></td>
</tr>
<tr>
<td>Transport to hospital, or doctor.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Inhalation</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>If fumes or combustion products are inhaled remove from contaminated area.</td>
<td></td>
</tr>
<tr>
<td>Lay patient down. Keep warm and rested.</td>
<td></td>
</tr>
<tr>
<td>Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.</td>
<td></td>
</tr>
<tr>
<td>Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary.</td>
<td></td>
</tr>
<tr>
<td>Transport to hospital, or doctor.</td>
<td></td>
</tr>
<tr>
<td>Inhalation of vapours or aerosols (mists, fumes) may cause lung oedema.</td>
<td></td>
</tr>
<tr>
<td>Corrosive substances may cause lung damage (e.g. lung oedema, fluid in the lungs).</td>
<td></td>
</tr>
<tr>
<td>As this reaction may be delayed up to 24 hours after exposure, affected individuals need complete rest (preferably in semi-recumbent posture) and must be kept under medical observation even if no symptoms are (yet) manifested.</td>
<td></td>
</tr>
<tr>
<td>Before any such manifestation, the administration of a spray containing a dexamethasone derivative or beclomethasone derivative may be considered.</td>
<td></td>
</tr>
<tr>
<td>This must definitely be left to a doctor or person authorised by him/her.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ingestion</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>For advice, contact a Poisons Information Centre or a doctor at once.</td>
<td></td>
</tr>
<tr>
<td>Urgent hospital treatment is likely to be needed.</td>
<td></td>
</tr>
<tr>
<td>If swallowed do NOT induce vomiting.</td>
<td></td>
</tr>
<tr>
<td>If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.</td>
<td></td>
</tr>
<tr>
<td>Observe the patient carefully.</td>
<td></td>
</tr>
<tr>
<td>Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious.</td>
<td></td>
</tr>
<tr>
<td>Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink.</td>
<td></td>
</tr>
<tr>
<td>Transport to hospital or doctor without delay.</td>
<td></td>
</tr>
</tbody>
</table>

Continued...
Indication of any immediate medical attention and special treatment needed

For acute or short term repeated exposures to strong acids:

- Airway problems may arise from laryngeal edema and inhalation exposure. Treat with 100% oxygen initially.
- Respiratory distress may require cricothyroidotomy if endotracheal intubation is contraindicated by excessive swelling.
- Intravenous lines should be established immediately in all cases where there is evidence of circulatory compromise.
- Strong acids produce a coagulation necrosis characterised by formation of a coagulum (eschar) as a result of the dessicating action of the acid on proteins in specific tissues.

INGESTION:

- Immediate dilution (milk or water) within 30 minutes post ingestion is recommended.
- DO NOT attempt to neutralise the acid since exothermic reaction may extend the corrosive injury.
- Be careful to avoid further vomit since re-exposure of the mucosa to the acid is harmful. Limit fluids to one or two glasses in an adult.
- Charcoal has no place in acid management.
- Some authors suggest the use of lavage within 1 hour of ingestion.

SKIN:

- Skin lesions require copious saline irrigation. Treat chemical burns as thermal burns with non-adherent gauze and wrapping.
- Deep second-degree burns may benefit from topical silver sulfadiazine.

EYE:

- Eye injuries require retraction of the eyelids to ensure thorough irrigation of the conjunctival cul-de-sacs. Irrigation should last at least 20-30 minutes. DO NOT use neutralising agents or any other additives.
- Cycloplegic drops, (1% cyclopentolate for short-term use or 5% homatropine for longer term use) antibiotic drops, vasoconstrictive agents or artificial tears may be indicated dependent on the severity of the injury.
- Steroid eye drops should only be administered with the approval of a consulting ophthalmologist.

[Ellenhorn and Barceloux: Medical Toxicology]

SECTION 5 FIREFIGHTING MEASURES

Extinguishing media

- Water spray or fog.
- Alcohol stable foam.
- Dry chemical powder.
- Carbon dioxide.

Special hazards arising from the substrate or mixture

Fire Incompatibility

- Avoid contamination with oxidising agents i.e. nitrates, oxidising acids, chlorine bleaches, pool chlorine etc. as ignition may result.

Advice for firefighters

<table>
<thead>
<tr>
<th>Fire Fighting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alert Fire Brigade and tell them location and nature of hazard.</td>
</tr>
<tr>
<td>Wear full body protective clothing with breathing apparatus.</td>
</tr>
<tr>
<td>Prevent, by any means available, spillage from entering drains or water course.</td>
</tr>
<tr>
<td>Use fire fighting procedures suitable for surrounding area.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fire/Explosion Hazard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Combustible.</td>
</tr>
<tr>
<td>Slight fire hazard when exposed to heat or flame.</td>
</tr>
<tr>
<td>Acids may react with metals to produce hydrogen, a highly flammable and explosive gas.</td>
</tr>
<tr>
<td>Heating may cause expansion or decomposition leading to violent rupture of containers.</td>
</tr>
</tbody>
</table>

Combustion products include:
- carbon dioxide (CO2)
- other pyrolysis products typical of burning organic material.

<table>
<thead>
<tr>
<th>HAZCHEM</th>
</tr>
</thead>
<tbody>
<tr>
<td>2X</td>
</tr>
</tbody>
</table>

SECTION 6 ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

See section 8

Environmental precautions

See section 12

Methods and material for containment and cleaning up

<table>
<thead>
<tr>
<th>Minor Spills</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drains for storage or use areas should have retention basins for pH adjustments and dilution of spills before discharge or disposal of material.</td>
</tr>
<tr>
<td>Check regularly for spills and leaks.</td>
</tr>
<tr>
<td>Clean up all spills immediately.</td>
</tr>
<tr>
<td>Avoid breathing vapours and contact with skin and eyes.</td>
</tr>
<tr>
<td>Control personal contact with the substance, by using protective equipment.</td>
</tr>
<tr>
<td>Contain and absorb spill with sand, earth, inert material or vermiculite.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Major Spills</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clear area of personnel and move upward.</td>
</tr>
<tr>
<td>Alert Fire Brigade and tell them location and nature of hazard.</td>
</tr>
<tr>
<td>Wear full body protective clothing with breathing apparatus.</td>
</tr>
<tr>
<td>Prevent, by any means available, spillage from entering drains or water course.</td>
</tr>
</tbody>
</table>

Personal Protective Equipment advice is contained in Section 8 of the SDS.

SECTION 7 HANDLING AND STORAGE

Precautions for safe handling

<table>
<thead>
<tr>
<th>Safe handling</th>
</tr>
</thead>
<tbody>
<tr>
<td>DO NOT allow clothing wet with material to stay in contact with skin</td>
</tr>
</tbody>
</table>

Continued...
Avoid all personal contact, including inhalation. 
Wear protective clothing when risk of exposure occurs. 
Use in a well-ventilated area. 
Avoid contact with moisture. 

Other information 
- Store in original containers. 
- Keep containers securely sealed. 
- Store in a cool, dry, well-ventilated area. 
- Store away from incompatible materials and foodstuff containers.

Conditions for safe storage, including any incompatibilities

- DO NOT use aluminium or galvanised containers
- Check regularly for spills and leaks
- Lined metal can, lined metal pail/can.
- Plastic pail.
- Polyliner drum.
- Packing as recommended by manufacturer.

For low viscosity materials
- Drums and jerricans must be of the non-removable head type.
- Where a can is to be used as an inner package, the can must have a screwed enclosure.
- For materials with a viscosity of at least 2680 cSt, (23 deg. C) and solids (between 15 C deg. and 40 deg C.):
  - Removable head packaging;
  - Cans with friction closures and
  - low pressure tubes and cartridges may be used.

Storage incompatibility
- Reacts with mild steel, galvanised steel/zinc producing hydrogen gas which may form an explosive mixture with air.
- Segregate from alkalies, oxidising agents and chemicals readily decomposed by acids, i.e. cyanides, sulfides, carbonates.
- Avoid strong bases.

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Control parameters

**OCCUPATIONAL EXPOSURE LIMITS (OEL)**

**INGREDIENT DATA**

Not Available

**EMERGENCY LIMITS**

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Material name</th>
<th>TEEL-1</th>
<th>TEEL-2</th>
<th>TEEL-3</th>
</tr>
</thead>
<tbody>
<tr>
<td>LACTIC ACID</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Original IDLH</th>
<th>Revised IDLH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lactic acid</td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
</tbody>
</table>

**Exposure controls**

**Appropriate engineering controls**

Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection.

The basic types of engineering controls are:
- Process controls which involve changing the way a job activity or process is done to reduce the risk.
- Enclosure and/or isolation of emission source which keeps a selected hazard “physically” away from the worker and ventilation that strategically “adds” and “removes” air in the work environment.

**Personal protection**

- Chemical goggles.
- Full face shield may be required for supplementary but never for primary protection of eyes.
- Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lenses or restrictions on use, should be created for each workplace or task.

**Eye and face protection**

See Hand protection below

**Skin protection**

- Wear chemical protective gloves, e.g. PVC.
- Wear safety footwear or safety gumboots, e.g. Rubber
- When handling corrosive liquids, wear trousers or overalls outside of boots, to avoid spills entering boots.

The selection of suitable gloves does not only depend on the material, but also on further marks of quality which vary from manufacturer to manufacturer. Where the chemical 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.

The exact break through time for substances has to be obtained from the manufacturer of the protective gloves and has to be observed when making a final choice.

Personal hygiene is a key element of effective hand care.

**Hands/feet protection**

See Other protection below

**Other protection**

- Overalls.
- PVC Apron.
- PVC protective suit may be required if exposure severe.
- Eyewash unit.

**Body protection**

See Other protection below

**Recommended material(s) & Respiratory protection**

Continued...
**GLOVE SELECTION INDEX**

Glove selection is based on a modified presentation of the: "Forsberg Clothing Performance Index". The effect(s) of the following substance(s) are taken into account in the computer-generated selection:

<table>
<thead>
<tr>
<th>Material</th>
<th>CPI</th>
</tr>
</thead>
<tbody>
<tr>
<td>NATURAL RUBBER</td>
<td>A</td>
</tr>
<tr>
<td>NATURAL-NEOPRENE</td>
<td>A</td>
</tr>
<tr>
<td>NEOPRENE</td>
<td>A</td>
</tr>
<tr>
<td>NEOPRENE/NATURAL</td>
<td>A</td>
</tr>
<tr>
<td>NITRILE</td>
<td>A</td>
</tr>
<tr>
<td>PVA</td>
<td>A</td>
</tr>
<tr>
<td>PVC</td>
<td>A</td>
</tr>
</tbody>
</table>

* CPI - Chemwatch Performance Index
  A: Best Selection
  B: Satisfactory; may degrade after 4 hours continuous immersion
  C: Poor to Dangerous Choice for other than short term immersion

**NOTE** As a series of factors will influence the actual performance of the glove, a final selection must be based on detailed observation. *Where the glove is to be used on a short term, casual or infrequent basis, factors such as "feel" or convenience (e.g. disposability), may dictate a choice of gloves which might otherwise be unsuitable following long-term or frequent use. A qualified practitioner should be consulted.

The effect(s) of the following substance(s) are taken into account in the "Forsberg Clothing Performance Index".

**SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES**

Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Colourless or yellowish, odourless, hygroscopic, syrupy liquid. Generally available as a 85% in water, also as 50% solution. Mixes with water, alcohol, ether, glycerol and furfural. Does not mix with chloroform, petroleum hydrocarbon solvents.</td>
</tr>
<tr>
<td>Physical state</td>
<td>Liquid</td>
</tr>
<tr>
<td>Odour</td>
<td>Not Available</td>
</tr>
<tr>
<td>Odour threshold</td>
<td>Not Available</td>
</tr>
<tr>
<td>pH (as supplied)</td>
<td>Not Available</td>
</tr>
<tr>
<td>Melting point / freezing point</td>
<td>17</td>
</tr>
<tr>
<td>Initial boiling point and boiling range (°C)</td>
<td>122 (15 mm)</td>
</tr>
<tr>
<td>Flash point (°C)</td>
<td>&gt;112</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>Not Available</td>
</tr>
<tr>
<td>Flammability</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Upper Explosive Limit (%)</td>
<td>Not available.</td>
</tr>
<tr>
<td>Lower Explosive Limit (%)</td>
<td>Not available.</td>
</tr>
<tr>
<td>Vapour pressure (kPa)</td>
<td>Not available.</td>
</tr>
<tr>
<td>Solubility in water (g/L)</td>
<td>Soluble</td>
</tr>
<tr>
<td>Vapour density (Air = 1)</td>
<td>3.1 (calc.)</td>
</tr>
</tbody>
</table>

**SECTION 10 STABILITY AND REACTIVITY**

Reactivity
See section 7

Chemical stability
Contact with alkaline material liberates heat

Possibility of hazardous reactions
See section 7

Conditions to avoid
See section 7

Incompatible materials
See section 7

Hazardous decomposition products
See section 5

**SECTION 11 TOXICOLOGICAL INFORMATION**
### Information on toxicological effects

#### Inhaled
The material is not thought to produce adverse health effects following inhalation (as classified by EC Directives using animal models). Nevertheless, adverse systemic effects have been produced following exposure of animals by at least one other route and good hygiene practice requires that exposure be kept to a minimum and that suitable control measures be used in an occupational setting. Corrosive acids can cause irritation of the respiratory tract, with coughing, choking and mucous membrane damage. There may be dizziness, headache, nausea and weakness.

Inhalation of quantities of liquid mist may be extremely hazardous, even lethal due to spasms, extreme irritation of larynx and bronchi, chemical pneumonitis and pulmonary oedema.

Not normally a hazard due to non-volatile nature of product.

#### Ingestion
The material can produce chemical burns within the oral cavity and gastrointestinal tract following ingestion. Accidental ingestion of the material may be damaging to the health of the individual.

Use as a food additive indicates good tolerance of small amounts, but excessive amounts or overuse may bring irritant and/or harmful effects.

Exposure to low-molecular organic acid solutions may produce spontaneous haemorrhaging, production of blood clots, gastrointestinal damage and narrowing of the oesophagus and stomach entry.

Ingestion of acid corrosives may produce burns around and in the mouth, the throat and oesophagus. Immediate pain and difficulties in swallowing and speaking may also be evident.

Clinical studies indicate even dilute preparations have some corrosive action in the human oesophagus and stomach. [Gosselein] Ingestion may produce vomiting, perspiration and shortness of breath. Severe exposures may result in cyanosis and vascular collapse.

#### Skin Contact
The material can produce chemical burns following direct contact with the skin. Skin contact with the material may damage the health of the individual; systemic effects may result following absorption.

Open cuts, abraded or irritated skin should not be exposed to this material.

Skin contact with acid corrosives may result in pain and burns; these may be deep with distinct edges and may heal slowly with the formation of scar tissue.

Entry into the bloodstream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.

#### Eye
The material can produce chemical burns to the eye following direct contact. Vapours or mists may be extremely irritating.

If applied to the eyes, this material causes severe eye damage. Direct eye contact with acid corrosives may produce pain, tears, sensitivity to light and burns. Mild burns of the epithelia generally recover rapidly and completely.

#### Chronic
Substance accumulation, in the human body, may occur and may cause some concern following repeated or long-term occupational exposure.

Repeated or prolonged exposure to acids may result in the erosion of teeth, swelling and/or ulceration of mouth lining. Irritation of airways to lung, with cough, and inflammation of lung tissue often occurs.

### Lactic Acid

<table>
<thead>
<tr>
<th><strong>lactic acid</strong></th>
<th><strong>TOXICITY</strong></th>
<th><strong>IRRITATION</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral (rat) LD50: 3543 mg/kg [2]</td>
<td></td>
<td>Eye (rabbit): 0.750 mg SEVERE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Skin (rabbit): 5 mg/24h SEVERE</td>
</tr>
</tbody>
</table>

**Legend:**
- 1. Value obtained from Europe ECHA Registered Substances - Acute toxicity 2. Value obtained from manufacturer’s SDS. Unless otherwise specified data extracted from RTECS - Register of Toxic Effect of Chemical Substances

### Lactic Acid

For acid mists, aerosols, vapours

Test results suggest that eukaryotic cells are susceptible to genetic damage when the pH falls to about 6.5. Cells from the respiratory tract have not been examined in this respect. Mucous secretion may protect the cells of the airway from direct exposure to inhaled acidic mists (which also protects the stomach lining from the hydrochloric acid secreted there).

For simple alpha hydroxy carboxylic acids and their salts:

Experimental data available for members of this group shows that they have low acute, repeat-dose, reproductive and developmental toxicity. They are eye and skin irritants, but are not expected to be skin sensitisers. Testing shows they have little or no potential to cause mutations or cancer.

The material may produce severe irritation to the eye causing pronounced inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.

The material may cause severe skin irritation after prolonged or repeated exposure and may produce on contact skin redness, swelling, the production of vesicles, scaling and thickening of the skin. Repeated exposures may produce severe ulceration.

Asthma-like symptoms may continue for months or even years after exposure to the material ends. This may be due to a non-allergic condition known as reactive airways dysfunction syndrome (RADS) which can occur after exposure to high levels of highly irritating compound. Main criteria for diagnosing RADS include the absence of previous airways disease in a non-atopic individual, with sudden onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant. Other criteria for diagnosis of RADS include a reversible airflow pattern on lung function tests, moderate to severe bronchial hyperreactivity on methacholine challenge testing, and the lack of minimal lymphocytic inflammation, without eosinophilia.

### Section 12 Ecological Information

#### Toxicity

<table>
<thead>
<tr>
<th><strong>endpoint</strong></th>
<th><strong>test duration (hr)</strong></th>
<th><strong>Species</strong></th>
<th><strong>value</strong></th>
<th><strong>source</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>LC50</td>
<td>96</td>
<td>Fish</td>
<td>195 mg/L</td>
<td>2</td>
</tr>
<tr>
<td>EC50</td>
<td>48</td>
<td>Crustacea</td>
<td>130 mg/L</td>
<td>2</td>
</tr>
<tr>
<td>NOEC</td>
<td>16</td>
<td>Crustacea</td>
<td>243 mg/L</td>
<td>4</td>
</tr>
</tbody>
</table>

[Continued...](#)
Ecotoxicity:
The tolerance of water organisms towards pH margin and variation is diverse. Recommended pH values for test species listed in OECD guidelines are between 6.0 and almost 9. Acute testing with fish showed 96h-LC50 at about pH 3.5 for simple alpha-hydroxy carboxylic acids and their salts:

Available experimental and estimated data for simple alpha-hydroxy carboxylic acids indicate that the members of this cluster have a low acute and chronic aquatic toxicity

Prevent, by any means available, spillage from entering drains or water courses.

**DO NOT** discharge into sewer or waterways.

<table>
<thead>
<tr>
<th>log Kow</th>
<th>BOD 5</th>
<th>COD</th>
</tr>
</thead>
<tbody>
<tr>
<td>-0.62</td>
<td>0.63-0.64, 22%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Fish LC50 (96 h): 600 mg/L

Persistence and degradability

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Persistence: Water/Soil</th>
<th>Persistence: Air</th>
</tr>
</thead>
<tbody>
<tr>
<td>lactic acid</td>
<td>LOW</td>
<td>LOW</td>
</tr>
</tbody>
</table>

Bioaccumulative potential

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Bioaccumulation</th>
</tr>
</thead>
<tbody>
<tr>
<td>lactic acid</td>
<td>LOW (LogKOW = -0.72)</td>
</tr>
</tbody>
</table>

Mobility in soil

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Mobility</th>
</tr>
</thead>
<tbody>
<tr>
<td>lactic acid</td>
<td>HIGH (KOC = 1)</td>
</tr>
</tbody>
</table>

SECTION 13 DISPOSAL CONSIDERATIONS

Waste treatment methods

<table>
<thead>
<tr>
<th>Product / Packaging disposal</th>
<th>Legislation addressing waste disposal requirements may differ by country, state and/or territory. Each user must refer to laws operating in their area. In some areas, certain wastes must be tracked.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A Hierarchy of Controls seems to be common - the user should investigate:</td>
</tr>
<tr>
<td></td>
<td>▶ Reduction</td>
</tr>
<tr>
<td></td>
<td>▶ Reuse</td>
</tr>
<tr>
<td></td>
<td>▶ Recycling</td>
</tr>
<tr>
<td></td>
<td>▶ Disposal (if all else fails)</td>
</tr>
<tr>
<td></td>
<td>This material may be recycled if unused, or if it has not been contaminated so as to make it unsuitable for its intended use.</td>
</tr>
<tr>
<td></td>
<td>DO NOT allow wash water from cleaning or process equipment to enter drains.</td>
</tr>
<tr>
<td></td>
<td>It may be necessary to collect all wash water for treatment before disposal.</td>
</tr>
<tr>
<td></td>
<td>In all cases disposal to sewer may be subject to local laws and regulations and these should be considered first.</td>
</tr>
<tr>
<td></td>
<td>Where in doubt contact the responsible authority.</td>
</tr>
<tr>
<td></td>
<td>Recycle wherever possible.</td>
</tr>
<tr>
<td></td>
<td>Consult manufacturer for recycling options or consult local or regional waste management authority for disposal if no suitable treatment or disposal facility can be identified.</td>
</tr>
<tr>
<td></td>
<td>Treat and neutralise at an approved treatment plant. Treatment should involve: Neutralisation with soda ash or soda-lime followed by: burial in a land-fill specifically licensed to accept chemical and/or pharmaceutical wastes or Incineration in a licensed apparatus</td>
</tr>
<tr>
<td></td>
<td>Decontaminate empty containers with 5% aqueous sodium hydroxide or soda ash, followed by water.</td>
</tr>
</tbody>
</table>

SECTION 14 TRANSPORT INFORMATION

Labels Required

<table>
<thead>
<tr>
<th>Marine Pollutant</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>HAZCHEM</td>
<td>2X</td>
</tr>
</tbody>
</table>

Land transport (ADG)

<table>
<thead>
<tr>
<th>UN number</th>
<th>3265</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN proper shipping name</td>
<td>CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (contains lactic acid)</td>
</tr>
<tr>
<td>Transport hazard class(es)</td>
<td>Class 8</td>
</tr>
<tr>
<td></td>
<td>Subrisk Not Applicable</td>
</tr>
<tr>
<td>Packing group</td>
<td>III</td>
</tr>
<tr>
<td>Environmental hazard</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Special precautions for user</td>
<td>Special provisions 223 274</td>
</tr>
<tr>
<td></td>
<td>Limited quantity 5 L</td>
</tr>
</tbody>
</table>

Air transport (ICAO-IATA / DGR)
UN number | 3265
---|---
UN proper shipping name | Corrosive liquid, acidic, organic, n.o.s. * (contains lactic acid)
Transport hazard class(es) | ICAO/IATA Class | 8
ICAO / IATA Subrisk | Not Applicable
ERG Code | 8L
Packing group | III
Environmental hazard | Not Applicable

Special precautions for user
- Special provisions: A3 A803
- Cargo Only Packing Instructions: 856
- Cargo Only Maximum Qty / Pack: 60 L
- Passenger and Cargo Packing Instructions: 852
- Passenger and Cargo Maximum Qty / Pack: 5 L
- Passenger and Cargo Limited Quantity Packing Instructions: Y841
- Passenger and Cargo Limited Maximum Qty / Pack: 1 L

Sea transport (IMDG-Code / GGVSee)
UN number | 3265
---|---
UN proper shipping name | CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (contains lactic acid)
Transport hazard class(es) | IMDG Class | 8
IMDG Subrisk | Not Applicable
Packing group | III
Environmental hazard | Not Applicable
Special precautions for user
- EMS Number: F-A , S-B
- Special provisions: 223 274
- Limited Quantities: 5 L

Transport in bulk according to Annex II of MARPOL and the IBC code
Source | Product name | Pollution Category | Ship Type
---|---|---|---
IMO MARPOL (Annex II) - List of Noxious Liquid Substances Carried in Bulk | Lactic acid | Z | 3

SECTION 15 REGULATORY INFORMATION

Safety, health and environmental regulations / legislation specific for the substance or mixture

LACTIC ACID(50-21-5) IS FOUND ON THE FOLLOWING REGULATORY LISTS

Australia Inventory of Chemical Substances (AICS)
- National Inventory: Australia - AICS
- Status: Y
- National Inventory: Canada - DSL
- Status: Y
- National Inventory: Canada - NDSL
- Status: N (lactic acid)
- National Inventory: China - IECSC
- Status: Y
- National Inventory: Europe - EINEC / ELINCS / NLP
- Status: Y
- National Inventory: Japan - ENCS
- Status: N (lactic acid)
- National Inventory: Korea - KECI
- Status: Y
- National Inventory: New Zealand - NZIoC
- Status: Y
- National Inventory: Philippines - PICCS
- Status: Y
- National Inventory: USA - TSCA
- Status: Y

Legend:
- **Y** = All ingredients are on the inventory
- **N** = Not determined or one or more ingredients are not on the inventory and are not exempt from listing (see specific ingredients in brackets)

SECTION 16 OTHER INFORMATION

Other information

Ingredients with multiple cas numbers
Name | CAS No
---|---
lactic acid | 50-21-5, 598-82-3, 79-33-4, 10326-41-7
Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.

The SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

**Definitions and abbreviations**

- PC — TWA: Permissible Concentration-Time Weighted Average
- PC — STEL: Permissible Concentration-Short Term Exposure Limit
- IARC: International Agency for Research on Cancer
- ACGIH: American Conference of Governmental Industrial Hygienists
- STEL: Short Term Exposure Limit
- TEEL: Temporary Emergency Exposure Limit
- IDLH: Immediately Dangerous to Life or Health Concentrations
- OSF: Odour Safety Factor
- NOAEL: No Observed Adverse Effect Level
- LOAEL: Lowest Observed Adverse Effect Level
- TLV: Threshold Limit Value
- LOD: Limit Of Detection
- OTV: Odour Threshold Value
- BCF: BioConcentration Factors
- BEI: Biological Exposure Index

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