

# SAFETY DATA SHEET

## L(+)-Lactic Acid

REVISION DATE 20/11/06  
REF. SD0010/2006-01

### 1. IDENTIFICATION OF THE SUBSTANCE / PREPARATION AND THE COMPANY / UNDERTAKING

<b># Product name</b>	PURAC®	
<b>Supplier</b>	PURAC America, Inc. 111 Barclay Blvd. Lincolnshire, IL 60069 USA	PBR sínteses Praça Pio X, 15, 9º andar CEP 20.040-020 Rio de Janeiro Brazil
<b>Telephone</b>	++1 847 634 6330	++55 21 203 2191
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<b>Supplier</b>	PURAC biochem Arkelsedijk 46 NL-4206 AC Gorinchem The Netherlands	PURAC bioquímica Gran Vial 19 -25 08160 Montmelo-Barcelona Spain
<b>Telephone</b>	++31 183 695695	++34 93 568 6300
<b>Fax</b>	++31 183 695604	++34 93 568 3955
<b>Emergency telephone</b>	++31 183 695695	++34 93 568 6300 (Ext 222)

### 2. COMPOSITION / INFORMATION ON INGREDIENTS

<b>Chemical name of the substance</b>	L(+)-Lactic Acid aqueous solution (50 -90%)	
<b>Synonyms</b>	Lactic Acid aqueous solution 2-Hydroxypropionic acid	S(+)-2-hydroxy propionic acid. Alpha hydroxypropionic acid
<b>CAS-No.</b>	79-33-4 (L(+)-Lactic Acid)	<b>EC-No.</b> 201-196-2 (L(+)-Lactic Acid)

### 3. HAZARDS IDENTIFICATION

<b>Most important hazards</b>	Irritating to eyes and skin. Risk of serious damage to eyes. May cause irritation of respiratory tract. May cause irritation of the mucous membranes.	
<b>Specific hazards</b>		
<b>Inhalation</b>	(short and long term)	irritation, breathing difficulties, headache, dizziness
	(short and long term)	irritation of digestive system
<b>Skin contact</b>	(short and long term)	irritation
<b>Eye contact</b>	(short and long term)	severe irritation, blurred vision
<b>Ingestion</b>	(short and long term)	burns, vomiting, gastrointestinal disturbance

### 4. FIRST AID MEASURES

<b>General advice</b>	Show this safety data sheet to the doctor in attendance.
<b>Inhalation</b>	Move to fresh air. If symptoms persist, call a physician.
<b>Skin contact</b>	Wash off immediately with soap and plenty of water removing all contaminated clothes and shoes. Obtain medical attention.
<b>Eye contact</b>	Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Obtain medical attention.
<b>Ingestion</b>	Consult a physician. If conscious, drink plenty of water. Never give anything by mouth to an unconscious person.
<b>Protection of first-aiders</b>	Wear impervious gloves and tightly fitting safety goggles. Avoid contact with skin and eyes.
<b>Notes to physician</b>	Oxygen, if needed. Avoid gastric lavage.

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### 5. FIRE-FIGHTING MEASURES

**Suitable extinguishing media** Water, carbon dioxide (CO<sub>2</sub>), foam, dry chemical.  
**Extinguishing media which must not be used for safety reasons** None.

**Specific hazards** Thermal decomposition can lead to release of irritating gases and vapors.

**Special protective equipment for firefighters** In the event of fire, wear self contained breathing apparatus.

**Specific methods** Standard procedure for chemical fires. Cool containers / tanks with water spray. Flash point > 234°F, (> 112°C)

### 6. ACCIDENTAL RELEASE MEASURES

**Personal precautions** Avoid contact with skin and eyes. Wear impervious gloves and tightly fitting safety goggles.

**Environmental precautions** Do not flush into surface water or sanitary sewer system.

**Methods for cleaning up** Dam up. Neutralize with limestone powder, lime, soda ash. Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Take up mechanically and collect in suitable container for disposal.

### 7. HANDLING AND STORAGE

**Technical measures/Precautions** Avoid temperatures above 392°F (200°C).  
**Safe handling advice** Avoid contact with skin and eyes. Wear impervious gloves and tightly fitting safety goggles. Do not breathe spray mist.

**Technical measures/Storage conditions** Store according to all current regulations. Keep container tightly closed. Keep in a dry, cool place.  
**Packaging material** Plastic or stainless steel 316 L containers.

### 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

**Engineering measures to reduce exposure** Insure adequate ventilation, especially in confined areas.  
**Exposure limit(s)** None.

**Personal protection equipment**  
**Respiratory protection** Not required; except in case of aerosol formation. Breathing apparatus needed only when aerosol or mist is formed.

**Hand protection** Rubber gloves.

**Eye protection** Face-shield, tightly fitting safety goggles.

**Skin and body protection** Long sleeved clothing, chemical resistant apron boots.

**Hygiene measures** Avoid contact with skin. When using, do not eat, drink or smoke. Remove and wash contaminated clothing before re-use.

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### 9. PHYSICAL AND CHEMICAL PROPERTIES

<b>Form</b>	aqueous solution
<b>Color</b>	colorless/yellow/ light brown
<b>Odor</b>	characteristic
<b>Molecular Weight</b>	90.08
<b>pH</b>	2 @ 77°F (25°C)
<b>Boiling point/range</b>	230°F (110°C) (40% solution) 257°F (125°C) (90% solution)
<b>Decomposition temperature</b>	> 392 °F (> 200°C)
<b>Autoignition temperature</b>	none
<b>Flash point</b>	> 234°F (> 112°C)
<b>Explosion limits</b>	not applicable
<b>Density</b>	1190 - 1250 kg/m <sup>3</sup>
<b>Surface tension</b>	50 - 44 mN/m (50 - 90% solution)
<b>Solubility</b>	Water solubility: completely soluble Partition coefficient (n-octanol/water) log Pow = - 0.62
<b>Viscosity</b>	5 - 60 mPa.s @ 77°F (25°C) (50 - 90% solution)

### 10. STABILITY AND REACTIVITY

<b>Stability</b>	Stable at normal conditions.
<b>Conditions to avoid</b>	Avoid temperatures above 392°F (200°C).
<b>Materials to avoid</b>	Oxidizing agents, metals, acids and bases.
<b>Hazardous decomposition products</b>	Carbon oxides. Thermal decomposition can lead to release of irritating gases and vapors.

### 11. TOXICOLOGICAL INFORMATION

<b>Acute toxicity</b>	LD50/oral/rat=3730 mg/kg LD50/oral/mouse=4875 mg/kg LD50/dermal/rabbit>2000mg/kg
<b>Irritation</b>	Eyes-rabbit: severe. Skin guinea pig: slight - none. Skin rabbit: severe. Tests on animals have shown that the effect of lactic acid on skin is species dependent. Human experience and results on guinea pigs have shown that it is irritant and not corrosive.
<b>Local effects</b>	Irritating to eyes and skin. Risk of serious damage to eyes. Inhalation of mist causes irritation of respiratory system.
<b>Carcinogen Status</b>	None.
<b>Mutagenic Data</b>	Tests on bacterial or mammalian cell cultures did not show mutagenic effects.
<b>Major effects of exposure</b>	
<b>Inhalation</b>	Inhalation of vapors is irritating to the respiratory system, may cause throat pain and cough. Inhalation of vapors in high concentration may cause shortness of breath (lung oedema). Chronic exposure may cause dermatitis, gastrointestinal disturbance, coughing.

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### 11. TOXICOLOGICAL INFORMATION Contd.

**Skin contact** May cause skin irritation. Prolonged skin contact may produce dermatitis.

**Eye contact** Severe eye irritation. Risk of serious damage to eyes. Liquid causes severe inflammation of conjunctiva and may cause severe damage of the cornea.

**Ingestion** Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea. May cause stomach perforation

**Further information** As an important metabolite in man, animals and plants, it is naturally formed and metabolised.

### 12. ECOLOGICAL INFORMATION

**Mobility** Completely soluble.

**Persistence / degradability** Readily biodegradable, according to appropriate OECD test.  
Biochemical oxygen demand (BOD)<sub>5</sub> = 0.45 mg O<sub>2</sub> /mg .  
Biochemical oxygen demand (BOD)<sub>20</sub> = 0.60 mg O<sub>2</sub>/mg.  
Chemical oxygen demand (COD) = 0.90 mg O<sub>2</sub> /mg.

**Bioaccumulation** None.

**Ecotoxicity** EC50/48h/Daphnia = 240mg/l  
LC50/48h/Fish = 320 mg/l  
EC50/Algae = 3500 mg/l (neutral)

**Further information** Natural product.

### 13. DISPOSAL CONSIDERATIONS

**Waste from residues / unused products** Subject to disposal regulations US EPA 40 CFR 2 62.

**Contaminated packaging** Clean container with water. Empty containers should be taken for local recycling, recovery or waste disposal.

### 14. TRANSPORT INFORMATION

Not classified as dangerous in the meaning of transport regulations.

### 15. REGULATORY INFORMATION

**US Regulations** USA TSCA Inventory Status Y  
SARA III N  
California Proposition 65 N  
Carcinogen status OSHA:N, NTP:N, IARC: N  
FDA GRAS

**EU Classification**

**Symbols** Xi - Irritant

**R- Phrases** R41 - Risk of serious damage to eyes.  
R38 - Irritating to skin.

**S-Phrases** S24 - Avoid contact with skin.  
S26 - In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.  
S37/39 - Wear suitable gloves and eye/face protection.

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**16. OTHER INFORMATION**NFPA Ratings (Scale 0-4) 1(health)-0(flammability)-0(reactivity)  
HMIS Rating 2(health)-0(flammability)-0(reactivity) B(protective equipment)

CAS-No. 50-21-5 (general) EC-No. 200-018-0 (general)

EEC Food additive: E 270

Further information on the safety assessment of lactic acid and its salts can be obtained in a CFTA Report of June 6th 1997.

Additional data on the calculated ecotoxicity of lactic acid and its salts and esters can be obtained in a report entitled 'The ecotoxicity and biodegradability of lactic acid, alkyl lactate esters and lactic acid salts' by Bowmer et al.  
(Reference: Chemosphere 37: 1317-1333 (1998))

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# indicates updated section.