

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

# Product name	PURAC®	
Supplier	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
Telephone	++1 847 634 6330	++55 21 203 2191
Fax	++1 847 634 1992	++55 21 263 9288
Emergency Telephone	(800) 424 9300	
Supplier	PURAC biochem Arkelsedijk 46 NL-4206 AC Gorinchem The Netherlands	PURAC bioquímica Gran Vial 19 -25 08160 Montmelo-Barcelona Spain
Telephone	++31 183 695695	++34 93 568 6300
Fax	++31 183 695604	++34 93 568 3955
Emergency telephone	++31 183 695695	++34 93 568 6300 (Ext 222)

2. COMPOSITION / INFORMATION ON INGREDIENTS

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

3. HAZARDS IDENTIFICATION

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

4. FIRST AID MEASURES

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

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5. FIRE-FIGHTING MEASURES

Suitable extinguishing media Water, carbon dioxide (CO₂), 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

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

10. STABILITY AND REACTIVITY

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

11. TOXICOLOGICAL INFORMATION

Acute toxicity	LD50/oral/rat=3730 mg/kg LD50/oral/mouse=4875 mg/kg LD50/dermal/rabbit>2000mg/kg
Irritation	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.
Local effects	Irritating to eyes and skin. Risk of serious damage to eyes. Inhalation of mist causes irritation of respiratory system.
Carcinogen Status	None.
Mutagenic Data	Tests on bacterial or mammalian cell cultures did not show mutagenic effects.
Major effects of exposure	
Inhalation	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) ₅ = 0.45 mg O ₂ /mg . Biochemical oxygen demand (BOD) ₂₀ = 0.60 mg O ₂ /mg. Chemical oxygen demand (COD) = 0.90 mg O ₂ /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 INFORMATIONNFPA 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.