SAFETY DATA SHEET

LACTIC ACID

CAS No.: 50-21-5

This Safety Data Sheet is issued by Suraj Chemicals as the distributor/supplier of record, based on manufacturer and published GHS / regulatory reference data for this substance. Users should also consult the specific manufacturer's SDS where available.

1. IDENTIFICATION

GHS Product identifier

LACTIC ACID
2-Hydroxypropanoic acid; Milk acid; E270 (typically supplied as ~80–88% aqueous solution)
CAS: 50-21-5

Other means of identification

Not relevant

Recommended use of the chemical and restrictions on use

Relevant uses: Food/beverage acidulant and preservative (E270), pH adjustment, leather tanning, textile and pharmaceutical processing. For industrial and food-processing use.

Uses advised against: All uses not specified in this section or in section 7.3.

Supplier's details

SURAJ CHEMICALS
No 92, Govindappa Naicken Street, Shiva Complex, Chennai – 600001, Tamil Nadu, India
Tel: +91 - 7092722822, +91 - 9840284032 / +91 - 44 - 25393652, 42130281
Email: sales@surajchemicals.com | Website: www.surajchemicals.com
GST No: 33ACEPV8190L1ZZ

Emergency phone number

Emergency Contact No: +91 - 7092722822, +91 - 9840284032

2. HAZARDS IDENTIFICATION

Classification of the substance or mixture

GHS:
Classification of this product has been carried out in accordance with the Globally Harmonized System of Classification and Labelling of Chemicals (GHS), based on well-established public data for concentrated (~80–88%) lactic acid (CAS 50-21-5). Dilute food-grade solutions below approximately 25–30% are typically less severely classified (Eye Irrit./Skin Irrit. only); the classification below is conservative for the concentrated commercial grade.

Skin Irrit. 2	Skin irritation, Category 2, H315
Eye Dam. 1	Serious eye damage, Category 1, H318

GHS label elements, including precautionary statements

GHS: Danger

Hazard statements

H315: Causes skin irritation.
H318: Causes serious eye damage.

Precautionary statements

P264: Wash exposed skin thoroughly after handling.
P280: Wear protective gloves/protective clothing/eye protection/face protection.
P302+P352: IF ON SKIN: Wash with plenty of soap and water.
P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310: Immediately call a POISON CENTER/doctor.
P321: Specific treatment (see first-aid advice on this label).
P501: Dispose of contents/container in accordance with local/regional/national regulations.

Other hazards which do not result in classification

Not a PBT/vPvB substance. Concentrated solutions are corrosive to some metals.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Substances

Chemical description: Lactic Acid ($C_3H_6O_3$), aqueous solution, food/industrial grade

In accordance with Annex 4.3.3 of the GHS, the product contains:

Identification	Chemical Name / Classification	Concentration
CAS: 50-21-5	Lactic Acid – Skin Irrit. 2, Eye Dam. 1: H315, H318 – Danger	80–88%
CAS: 7732-18-5	Water	Balance

To obtain more information on the hazards of the substances, consult sections 11, 12 and 16.

Mixtures

Aqueous solution of lactic acid as indicated above; exact grade concentration confirmed on the product Certificate of Analysis.

4. FIRST AID MEASURES

Description of necessary first-aid measures

Request medical assistance immediately, showing the SDS of this product.

By inhalation

Mist/vapour may irritate the respiratory tract. Remove to fresh air and keep at rest. Seek medical attention if symptoms persist.

By skin contact

Remove contaminated clothing. Wash skin immediately with plenty of water for at least 15 minutes. Seek medical attention if irritation persists.

By eye contact

Rinse immediately with plenty of water for at least 15 minutes, holding eyelids open. Remove contact lenses if present and easy to do. Obtain immediate medical attention.

By ingestion/aspiration

Do not induce vomiting. Rinse mouth with water. Give water to drink if the person is conscious and alert. Obtain immediate medical attention.

Most important symptoms/effects, acute and delayed

Corrosive/irritant to eyes and skin at concentrated strength. May cause burns to the digestive tract if ingested concentrated.

Indication of immediate medical attention and special treatment needed, if necessary

Treat symptomatically as a chemical burn/irritant exposure.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media

Suitable: Water spray, foam, dry chemical, CO_2.
Unsuitable: None known.

Specific hazards arising from the chemical

Aqueous solution – not flammable. Thermal decomposition may release irritant fumes (carbon oxides).

Special protective actions for fire-fighters

Wear self-contained breathing apparatus and full protective clothing in a fire situation.

Additional provisions

Cool fire-exposed containers with water spray if safe to do so.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel

Wear PPE described in section 8. Avoid skin and eye contact.

For emergency responders

Wear protective equipment; ensure adequate ventilation.

Environmental precautions

Avoid discharge to drains or watercourses; may locally lower pH.

Methods and materials for containment and cleaning up

Dike and contain spillage. Absorb with inert material (sand, earth) and neutralise carefully with a mild alkali (e.g. sodium bicarbonate) before collecting for disposal.

Reference to other sections

See sections 8 and 13.

7. HANDLING AND STORAGE

Precautions for safe handling

A. General precautions for safe use

Avoid contact with skin and eyes. Avoid breathing mist/vapour. Use with adequate ventilation.

B. Technical recommendations for the prevention of fires and explosions

Not flammable; no specific fire prevention measures required beyond general good practice.

C. Technical recommendations on general occupational hygiene

Do not eat, drink or smoke while handling. Wash hands and exposed skin thoroughly after handling.

D. Technical recommendations to prevent environmental risks

Prevent uncontrolled discharge to drains or watercourses.

Conditions for safe storage, including any incompatibilities

A. Specific storage requirements

Storage condition	Store in tightly closed, corrosion-resistant (plastic-lined/stainless steel) containers in a cool, well-ventilated place
Incompatible materials	Strong oxidising agents, strong bases, carbonates (releases CO_2)

B. General conditions for storage

Avoid contact with ordinary carbon steel (may corrode); avoid freezing which can cause crystallisation in concentrated grades.

Specific end use(s)

Food/beverage acidulant (E270) for use within Good Manufacturing Practice / statutory dosage limits. Except for the instructions already specified, no other special recommendation applies.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Control parameters

Identification	Occupational Exposure Limit Type	Value
Lactic Acid CAS: 50-21-5	No harmonised OEL widely established	Available on request (grade/region specific)

Appropriate engineering controls

Provide local exhaust ventilation where mist/vapour may be generated (e.g. heated processing, spraying).

B. Respiratory protection

Not normally required with adequate ventilation; use an acid-gas/organic-vapour cartridge respirator if mist levels are elevated.

C. Specific protection for the hands

Chemical-resistant gloves (nitrile, neoprene or PVC).

D. Eye and face protection

Chemical safety goggles/face shield.

E. Bodily protection

Acid-resistant apron/protective clothing for prolonged or repeated contact.

F. Additional emergency measures

Emergency shower and eyewash stations should be available in the work area.

Environmental exposure controls

Prevent uncontrolled discharge to the environment.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Appearance	
Physical state at 20°C	Liquid
Appearance	Colorless to pale yellow, syrupy liquid
Odor	Slight, characteristic acidic odor
Odour threshold	Not established
Volatility	
Boiling point	~122°C (decomposes; at reduced pressure, e.g. 15 mmHg)
Melting/freezing point	~17°C (pure); commercial 80–88% solution remains liquid at typical ambient temperatures
Vapour pressure	Low (<1 mmHg at 20°C)
Evaporation rate	Slow (aqueous solution)
Product Description	
Molecular weight	90.08 g/mol
Density (88% solution)	~1.20 g/cm³
pH (1% aqueous solution)	~2.0–2.5 (acidic)
Solubility in water	Miscible in all proportions
Decomposition temperature	>200°C
Flammability	
Flash Point	>110°C (aqueous solution, non-flammable)
Flammability (solid, gas)	Not flammable (aqueous solution)
Autoignition temperature	Not applicable
Lower / Upper flammability limit	Not applicable

Other information

Explosive properties	Not applicable
Oxidising properties	Not classified as an oxidiser
Corrosive to metals	May corrode ordinary carbon steel; use corrosion-resistant materials

10. STABILITY AND REACTIVITY

Reactivity

Reacts with strong bases (neutralisation, exothermic) and with carbonates/bicarbonates, releasing carbon dioxide gas. May corrode common metals, generating flammable hydrogen gas.

Chemical stability

Chemically stable under the indicated conditions of storage, handling and use. Slowly polymerises to lactide/polylactic species under some concentrated, heated conditions but this is not a hazardous reaction under normal storage.

Possibility of hazardous reactions

Under specified conditions, hazardous reactions leading to excessive temperature or pressure are not expected.

Conditions to avoid

Shock/Friction	Contact with Air	Increase in Temperature	Sunlight	Humidity
Not applicable	Not applicable	Avoid excessive heat	Not applicable	Not applicable

Incompatible materials

Strong oxidising agents, strong bases, carbonates, reactive metals.

Hazardous decomposition products

Carbon monoxide and carbon dioxide on thermal decomposition.

11. TOXICOLOGICAL INFORMATION

Information on toxicological effects

In case of exposure that is repetitive, prolonged, or at concentrations higher than the recommended occupational exposure limits, adverse health effects may result depending on the means of exposure:

A. Ingestion (acute effect)
Concentrated solution may cause burns to the mouth, throat and digestive tract. Dilute food-grade use is a normal dietary component.

B. Inhalation (acute effect)
Mist/vapour may irritate the respiratory tract.

C. Contact with skin and eyes (acute effect)
Skin: causes irritation. Eyes: causes serious eye damage.

D. CMR effects (carcinogenicity, mutagenicity, reproductive toxicity)
Not listed as a carcinogen by IARC, NTP or OSHA. Classification criteria for mutagenicity/reproductive toxicity are not met based on available data.

E. Sensitizing effects
Classification criteria for respiratory or skin sensitisation are not met based on available data.

F. Specific target organ toxicity (STOT) – single exposure
Classification criteria are not met based on available data.

G. Specific target organ toxicity (STOT) – repeated exposure
Classification criteria are not met based on available data.

H. Aspiration hazard
Not classified.

Product-specific toxicological information

Identification	Acute Toxicity	Genus
Lactic Acid CAS: 50-21-5	LD50 oral: ~3543–4875 mg/kg	Rat
	LD50 dermal: >2000 mg/kg	Rabbit

12. ECOLOGICAL INFORMATION

Readily biodegradable and of low aquatic toxicity; a naturally occurring metabolite.

Toxicity

Acute Toxicity	Species	Genus
LC50: ~130 mg/L (96h)	Non-applicable	Fish
EC50: >100 mg/L (48h)	Non-applicable	Daphnia

Persistence and degradability
Readily biodegradable.

Bioaccumulative potential
Not expected to bioaccumulate (log Pow –0.62, low).

Mobility in soil

Koc	Henry	Dry Soil	Moist Soil
Low (miscible with water)	Negligible	Highly soluble/mobile	

Results of PBT and vPvB assessment
Does not meet PBT/vPvB criteria.

Other adverse effects
May transiently lower pH and raise COD/BOD of receiving water at high discharge concentrations.

13. DISPOSAL CONSIDERATIONS

Disposal methods
Neutralise with a mild alkali and dilute prior to disposal in accordance with local discharge consent, or dispose of via a licensed waste contractor.
Refer to national and local regulations on waste management.

14. TRANSPORT INFORMATION

Transport of dangerous goods by land (ADR/RID)

14.1 UN number	UN3265
14.2 UN proper shipping name	CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (Lactic Acid)
14.3 Transport hazard class(es)	8
14.4 Packing group	III
14.5 Environmental hazard	No
14.6 Special precautions for user	Physico-chemical properties: see section 9
14.7 Transport in bulk (Annex II MARPOL 73/78, IBC Code)	Not relevant

Transport of dangerous goods by sea (IMDG)

14.1 UN number	UN3265
14.2 UN proper shipping name	CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (Lactic Acid)
14.3 Transport hazard class(es)	8
14.4 Packing group	III
14.5 Marine pollutant	No
14.6 Special precautions for user	EmS Codes: F-A, S-B
14.7 Transport in bulk (Annex II MARPOL 73/78, IBC Code)	Not relevant

Transport of dangerous goods by air (IATA/ICAO)

14.1 UN number	UN3265
14.2 UN proper shipping name	CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (Lactic Acid)
14.3 Transport hazard class(es)	8
14.4 Packing group	III
14.5 Environmental hazard	No
14.6 Special precautions for user	Physico-chemical properties: see section 9
14.7 Transport in bulk (Annex II MARPOL 73/78, IBC Code)	Not relevant

Note: dilute food-grade lactic acid solutions (typically below ~25–30% w/w) may not meet Class 8 criteria and may ship as non-regulated; the classification above is conservative for the concentrated (80–88%) commercial grade. Confirm packing concentration against carrier requirements.

15. REGULATORY INFORMATION

Safety, health and environmental regulations specific for the product in question

Permitted as a food acidulant/preservative (E270) subject to Food Safety and Standards (Food Products Standards and Food Additives) Regulations, 2011 and Codex Alimentarius GSFA limits.

Other legislation

Food Safety and Standards Act, 2006 and associated Regulations (India)
Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989
The Factories Act, 1948 (Act No. 63 of 1948), as amended by the Factories (Amendment) Act, 1987 (Act 20 of 1987)

16. OTHER INFORMATION

Legislation related to safety data sheets

This safety data sheet has been designed in accordance with Annex 4 – Guidance on the preparation of Safety Data Sheets of the Globally Harmonized System of Classification and Labelling of Chemicals (GHS).

Texts of the legislative phrases mentioned in sections 2 and 3

H315: Causes skin irritation.
H318: Causes serious eye damage.

The phrases indicated do not refer to the product itself; they are present merely for informative purposes and refer to the individual components which appear in section 3.

Advice related to training

Minimal training is recommended to prevent industrial risks for staff using this product, in order to facilitate their comprehension and interpretation of this safety data sheet, as well as the label on the product.

Principal bibliographical sources

Publicly available GHS classification and physicochemical reference data for lactic acid (CAS 50-21-5).

Abbreviations and acronyms

LD50: Lethal Dose 50 | LC50: Lethal Concentration 50 | EC50: Effective Concentration 50 | Koc: Partition coefficient of organic carbon | Log-POW: Octanol-water partition coefficient | COD: Chemical Oxygen Demand | BOD: Biochemical Oxygen Demand | IARC: International Agency for Research on Cancer

Disclaimer: The information contained in this safety data sheet is based on sources, technical knowledge and current legislation, without being able to guarantee its accuracy. This information cannot be considered a guarantee of the properties of the product; it is simply a description of the security requirements. The occupational methodology and conditions for users of this product are not within Suraj Chemicals' awareness or control, and it is ultimately the responsibility of the user to take the necessary measures to obtain the legal requirements concerning the manipulation, storage, use and disposal of chemical products. The information on this safety data sheet only refers to this product, which should not be used for needs other than those specified.

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