1. Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

- Trade name: L(+)-Lactic Acid
- Substance name: L(+)-lactic acid aqueous solution
- Molecular formula: C3-H6-O3
- Chemical identity: S(+)-2-Hydroxypropanoic acid
- CAS-No.: 79-33-4
- EC-No.: 201-196-2

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

Use of the Substance/Mixture: Food/feedstuff additives, Pharmaceutical substance, Personal care, Cleaning agent, Biocidal product, Industrial use

1.3 Details of the supplier of the safety data sheet

- Company: Jungbunzlauer S.A.
  Z.I. Portuaire
  BP 32
  67390 Marckolsheim
  France
  www.jungbunzlauer.com
- Telephone: +33 388 582-929
- Telefax: +33 388 582-941
- E-mail address: msds@jungbunzlauer.com

1.4 Emergency telephone number

- Telephone: CHEMTREC +1 800 424-9300

2. Hazards identification

2.1 Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008)

- Skin irritation, Category 2: H315: Causes skin irritation.
- Eye irritation, Category 1: H318: Causes serious eye damage.

Classification (67/548/EEC, 1999/45/EC)

- Irritant: R41: Risk of serious damage to eyes.
SAFETY DATA SHEET

L(+)-Lactic Acid

Version .0  Revision Date 30.04.2012  Print Date 30.04.2012

R38: Irritating to skin.

2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008)

Hazard pictograms :

Signal word : Danger

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

Precautionary statements :

Prevention:
P264 Wash skin thoroughly after handling.
P280 Wear protective gloves/ eye protection/ face protection.

Response:
P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
P332 + P313 If skin irritation occurs: Get medical advice/ attention.
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 or doctor/ physician.

2.3 Other hazards

3. Composition/information on ingredients

3.1 Substances

3.2 Mixtures

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<thead>
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<td>79-33-4</td>
<td>C; R41-R38</td>
<td>1; H318</td>
<td>&gt;= 50</td>
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<td>H2O</td>
<td>7732-18-5</td>
<td></td>
<td></td>
<td>&lt;= 50</td>
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</table>

For the full text of the R-phrases mentioned in this Section, see Section 16.
For the full text of the H-Statements mentioned in this Section, see Section 16.
4. First aid measures

4.1 Description of first aid measures

General advice : In the case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). Show this safety data sheet to the doctor in attendance. First aider needs to protect himself. Wash contaminated clothing before re-use.

If inhaled : If breathed in, move person into fresh air. If symptoms persist, call a physician.

In case of skin contact : In case of contact, immediately flush skin with soap and plenty of water. If skin irritation persists, call a physician. Take off contaminated clothing and shoes immediately.

In case of eye contact : Protect unharmed eye. If easy to do, remove contact lens, if worn. In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

If swallowed : If swallowed, seek medical advice immediately and show this container or label. Gently wipe or rinse the inside of the mouth with water. If swallowed, DO NOT induce vomiting.

4.2 Most important symptoms and effects, both acute and delayed

4.3 Indication of any immediate medical attention and special treatment needed

5. Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media : Water spray
Dry powder
Foam
Carbon dioxide (CO2)

5.2 Special hazards arising from the substance or mixture

Specific hazards during firefighting : Do not use a solid water stream as it may scatter and spread fire. Hazardous decomposition products may be formed under fire conditions (see section 10). Exposure to decomposition products may be a hazard to health.

5.3 Advice for firefighters

Special protective equipment for firefighters : In the event of fire, wear self-contained breathing apparatus. Use personal protective equipment.
Further information:
Standard procedure for chemical fires.
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
In the event of fire and/or explosion do not breathe fumes.
Use water spray to cool unopened containers.
Collect contaminated fire extinguishing water separately. This must not be discharged into drains.
Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.

6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions:
Refer to protective measures listed in sections 7 and 8.
Use personal protective equipment.
Avoid contact with skin and eyes.
Ensure adequate ventilation, especially in confined areas.
Avoid inhalation of vapour or mist.

6.2 Environmental precautions

Environmental precautions:
Do not flush into surface water or sanitary sewer system.
Prevent further leakage or spillage if safe to do so.
If the product contaminates rivers and lakes or drains inform respective authorities.

6.3 Methods and materials for containment and cleaning up

Methods for cleaning up:
Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust).
Keep in suitable, closed containers for disposal.
Clean contaminated surface thoroughly.

6.4 Reference to other sections

7. Handling and storage

7.1 Precautions for safe handling

Advice on safe handling:
For personal protection see section 8.
Do not breathe vapours or spray mist.
Avoid contact with skin and eyes.

Advice on protection against fire and explosion:
Normal measures for preventive fire protection.

Dust explosion class:
not applicable

7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers:
Store in original container.
Keep in an area equipped with acid resistant flooring.

Advice on common storage:
Incompatible with bases.
7.3 Specific end uses

8. Exposure controls/personal protection

8.1 Control parameters
Contains no substances with occupational exposure limit values.

8.2 Exposure controls

Engineering measures
Provide sufficient air exchange and/or exhaust in work rooms.

Personal protective equipment

Respiratory protection : In the case of vapour formation use a respirator with an approved filter.

Hand protection : Choose gloves to protect hands against chemicals depending on the concentration and quantity of the hazardous substance and specific to place of work.

Eye protection : Wear eye/face protection.

Skin and body protection : Wear suitable protective clothing.
Choose body protection according to the amount and concentration of the dangerous substance at the work place.

Hygiene measures : Handle in accordance with good industrial hygiene and safety practice.
General industrial hygiene practice.
Avoid breathing vapors, mist or gas.
Avoid contact with skin, eyes and clothing.
When using do not eat, drink or smoke.
Wash hands before breaks and at the end of workday.
Follow the skin protection plan.
Take off all contaminated clothing immediately.
Wash contaminated clothing before re-use.

Environmental exposure controls

General advice : Do not flush into surface water or sanitary sewer system.
Prevent further leakage or spillage if safe to do so.
If the product contaminates rivers and lakes or drains inform respective authorities.
9. Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance : Aqueous solution
Colour : colourless
         light yellow
Odour : characteristic
Flash point : not applicable
Autoignition temperature : not auto-flammable
pH : < 2
     at 25 °C
Boiling point/boiling range : 110 - 130 °C
Density : 1.100 - 1.250 g/cm3
Water solubility : completely miscible
Partition coefficient: n-octanol/water : log Pow: -0.62
Viscosity, dynamic : 5 - 60 mPa.s
     at 25 °C

9.2 Other information

10. Stability and reactivity

10.1 Reactivity
No decomposition if stored and applied as directed.

10.2 Chemical stability
Stable under normal conditions.

10.3 Possibility of hazardous reactions
Hazardous reactions : Hazardous decomposition products formed under fire conditions.

10.4 Conditions to avoid
Conditions to avoid : Temperature > 200 °C

10.5 Incompatible materials
Materials to avoid : Bases
                     Oxidizing agents

10.6 Hazardous decomposition products
11. Toxicological information

11.1 Information on toxicological effects

**Acute toxicity**

**Acute oral toxicity**
- L(+)-lactic acid: LD50 Oral: 3.730 mg/kg
  - Species: rat
- LD50 Oral: 4.875 mg/kg
  - Species: mouse

**Acute dermal toxicity**
- L(+)-lactic acid: LD50 Dermal: > 2.000 mg/kg
  - Species: rabbit

**Skin corrosion/irritation**

**Skin irritation**
- L(+)-lactic acid: Species: guinea pig
  - Result: Mild skin irritation
- Species: rabbit
  - Result: Severe skin irritation

**Serious eye damage/eye irritation**

**Eye irritation**
- L(+)-lactic acid: Species: rabbit
  - Result: irritating

**Respiratory or skin sensitization**

**Germ cell mutagenicity**

**Assessment**
- L(+)-lactic acid: Tests on bacterial or mammalian cell cultures did not show mutagenic effects.

**Carcinogenicity**

**Assessment**
- L(+)-lactic acid: Animal testing did not show any carcinogenic effects.

**Reproductive toxicity**

**Assessment**

**Target Organ Systemic Toxicant - Repeated exposure**
12. Ecological information

12.1 Toxicity

Toxicity to fish
L(+)-lactic acid : LC50: 320 mg/l
Exposure time: 48 h

Toxicity to daphnia and other aquatic invertebrates.
L(+)-lactic acid : 240 mg/l
Exposure time: 48 h
Species: Daphnia pulex (Water flea)

Toxicity to algae
L(+)-lactic acid : EC50: 3.500 mg/l
Species: Scenedesmus capricornutum (fresh water algae)

12.2 Persistence and degradability

Biodegradability
L(+)-lactic acid : Readily biodegradable.

Biochemical Oxygen Demand (BOD)
L(+)-lactic acid : 0.45 mg/mg
5 d
0.6 mg/mg
20 d

Chemical Oxygen Demand (COD)
L(+)-lactic acid : 0.9 mg/mg

12.3 Bioaccumulative potential

Bioaccumulation
L(+)-lactic acid : The product is miscible in water and readily biodegradable in both water and soil. Accumulation is not expected.

12.4 Mobility in soil

12.5 Results of PBT and vPvB assessment

L(+)-lactic acid : This substance is not considered to be persistent, bioaccumulating nor toxic (PBT).

12.6 Other adverse effects
13. Disposal considerations

13.1 Waste treatment methods

Product

In accordance with local and national regulations.
Do not dispose of waste into sewer.
Do not dispose of together with household waste.

Contaminated packaging

Empty containers should be taken to an approved waste handling site for recycling or disposal.

14. Transport information

ADR
Not dangerous goods

DOT
Not a Hazardous Material

IATA
Not dangerous goods

IMDG
Not dangerous goods

RID
Not dangerous goods

15. Regulatory information

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

Major Accident Hazard Legislation

96/82/EC Update: 2003
Directive 96/82/EC does not apply

Notification status

CERCLA
Not considered hazardous
SARA Title III
Not considered hazardous
TSCA
On TSCA Inventory
DSL
All components of this product are on the Canadian DSL list.
WHMIS
Class E

15.2 Chemical Safety Assessment
16. Other information

Full text of R-phrases referred to under sections 2 and 3

R38  Irritating to skin.
R41  Risk of serious damage to eyes.

Full text of H-Statements referred to under sections 2 and 3.

H315  Causes skin irritation.
H318  Causes serious eye damage.

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

This safety datasheet only contains information relating to safety and does not replace any product information or product specification.