

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006 (REACH)

Revision date: 8 May 2024

Print date: 10 May 2024

Version: 1



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L-Citrulline

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Trade name/designation:

L-Citrulline

Other means of identification:

2-Amino-5-(carbamoylamino)pentatonic acid

$C_6H_{13}N_3O_3$

CAS No.:

372-75-8

EC No.:

206-759-6

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

Relevant identified uses:

Life cycle stage [LCS]

M: Manufacture

IS: Use at industrial sites

Product Categories [PC]

PC 39: Cosmetics, personal care products

Process categories [PROC]

PROC 3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition

Environmental release categories [ERC]

ERC 6a: Use of intermediate

1.3. Details of the supplier of the safety data sheet

Supplier (manufacturer/importer/only representative/downstream user/distributor):

Kyowa Hakko Europe GmbH

Am Wehrhahn 50

40211 Düsseldorf

Germany

Telephone: +49-211-175-45-0

Telefax: +49-211-175-45-441

E-mail: bio-chemicals@kyowa.de

Website: <http://www.kyowahakko-bio.co.jp/>

1.4. Emergency telephone number

Kyowa Hakko Europe GmbH, +49-211-175-45-0 (only available during office hours)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP]

Hazard classes and hazard categories	Hazard statements	Classification procedure
Skin corrosion/irritation (<i>Skin Irrit. 2</i>)	H315: Causes skin irritation.	Self-classification
Serious eye damage/eye irritation (<i>Eye Irrit. 2</i>)	H319: Causes serious eye irritation.	Self-classification

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2.2. Label elements

Labelling according to Regulation (EC) No. 1272/2008 [CLP]

Hazard pictograms:



GHS07

Exclamation mark

Signal word: Warning

Hazard statements for health hazards

H315	Causes skin irritation.
H319	Causes serious eye irritation.

Supplemental hazard information: none

Precautionary statements Prevention

P264	Wash hands thoroughly after handling.
P280	Wear protective gloves and eye protection/face protection.

Precautionary statements Response

P302 + P352	IF ON SKIN: Wash with plenty of water and soap.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P332 + P313	If skin irritation occurs: Get medical advice/attention.
P337 + P313	If eye irritation persists: Get medical advice/attention.
P362	Take off contaminated clothing.

2.3. Other hazards

Adverse physicochemical effects:

none

Adverse human health effects and symptoms:

none

This substance does not have endocrine disrupting properties with respect to humans.

Adverse environmental effects:

none

This substance does not have endocrine disrupting properties with respect to non-target organisms.

This substance does not meet the PBT/vPvB criteria of REACH, Annex XIII.

Other adverse effects:

none

SECTION 3: Composition/information on ingredients

3.1. Substances

Hazardous ingredients / Hazardous impurities / Stabilisers:

Product identifiers	Substance name Classification according to Regulation (EC) No. 1272/2008 [CLP]	Concentration
CAS No.: 372-75-8 EC No.: 206-759-6	L-Citrulline Eye Irrit. 2 (H319), Skin Irrit. 2 (H315) Warning	> 99 weight-%

Full text of H- and EUH-phrases: see section 16.

SECTION 4: First aid measures

4.1. Description of first aid measures

General information:

When in doubt or if symptoms are observed, get medical advice.

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Following inhalation:

Provide fresh air.

In case of respiratory tract irritation, consult a physician.

In case of skin contact:

Rinse skin with water/shower.

In case of skin irritation, consult a physician.

After eye contact:

Rinse immediately carefully and thoroughly with eye-bath or water.

In case of eye irritation consult an ophthalmologist.

Following ingestion:

Rinse mouth.

Get medical advice/attention if you feel unwell.

Self-protection of the first aider:

Use personal protection equipment.

4.2. Most important symptoms and effects, both acute and delayed

Serious eye damage/eye irritation

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

Treat symptomatically.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media:

Water, Foam,

Co-ordinate fire-fighting measures to the fire surroundings.

Unsuitable extinguishing media:

no restriction

5.2. Special hazards arising from the substance or mixture

The product itself does not burn.none

The product itself does not burn.

Hazardous combustion products:

Carbon dioxide (CO₂)

5.3. Advice for firefighters

Co-ordinate fire-fighting measures to the fire surroundings.

In case of fire: Wear self-contained breathing apparatus.

5.4. Additional information

Collect contaminated fire extinguishing water separately. Do not allow entering drains or surface water.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

Personal precautions:

No special measures are necessary.

Avoid breathing dust/fume/gas/mist/vapours/spray. Remove persons to safety.

Protective equipment:

Personal protection equipment: see section 8

Wear protective gloves/protective clothing/eye protection/face protection.

6.1.2. For emergency responders

Personal protection equipment:

Personal protection equipment: see section 8

6.2. Environmental precautions

Do not allow to enter into surface water or drains.

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6.3. Methods and material for containment and cleaning up

For containment:

Collect spillage.

Measures to prevent aerosol and dust generation

Wet clean or vacuum up solids.

For cleaning up:

Take up mechanically.

Wash with plenty of water (with detergents).

6.4. Reference to other sections

Safe handling: see section 7

Personal protection equipment: see section 8

Disposal: see section 13

6.5. Additional information

Use appropriate container to avoid environmental contamination.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Protective measures

Advices on safe handling:

Wear personal protection equipment (refer to section 8).

Fire prevent measures:

Usual measures for fire prevention.

Measures to prevent aerosol and dust generation:

Dust should be exhausted directly at the point of origin.

Environmental precautions:

No special environmental measures are necessary.

Advices on general occupational hygiene

When using do not eat, drink, smoke, sniff.

Avoid contact with skin, eyes and clothes.

7.2. Conditions for safe storage, including any incompatibilities

Technical measures and storage conditions:

Keep container tightly closed in a cool, well-ventilated place.

Packaging materials:

Glass, PE (polyethylene), PP (Polypropylene)

Requirements for storage rooms and vessels:

Keep/Store only in original container.

Storage class (TRGS 510, Germany): 13 – Non-combustible solids that cannot be assigned to any of the above storage classes

7.3. Specific end use(s)

No data available

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

No data available

8.2. Exposure controls

8.2.1. Appropriate engineering controls

Recommendation:

If handled uncovered, arrangements with local exhaust ventilation have to be used.

8.2.2. Personal protection equipment

Eye/face protection:

Eye glasses with side protection EN 166

Skin protection:

Half-gloves, dust-tight

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By long-term hand contact

Suitable material: NBR (Nitrile rubber)

In the case of wanting to use the gloves again, clean them before taking off and air them well.

Respiratory protection:

Usually no personal respiratory protection necessary.

Handling larger quantities dust formation:

Recommendation:

Quarter-face mask (EN 140) Particle filter device (EN 143)

8.2.3. Environmental exposure controls

No data available

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance

Physical state: solid

Colour: not determined

Odour: odourless

Odour threshold: not applicable

Safety relevant basis data

Parameter	Value	at °C	① Method ② Remark
pH	5.7 – 6.7	20 °C	
Melting point	220 – 221 °C		② Decomposition temperature
Freezing point	No data available		
Initial boiling point and boiling range	not applicable		
Flash point	not applicable		
Evaporation rate	No data available		
Auto-ignition temperature	not applicable		
Upper/lower flammability or explosive limits	not applicable		
Vapour pressure	No data available		
Density	No data available		
Bulk density	No data available		
Water solubility	200 g/L	20 °C	
Partition coefficient: n-octanol/water	No data available		
Dynamic viscosity	not applicable		
Kinematic viscosity	not applicable		

particle characteristics:

nanomaterial: negative

9.2. Other information

No data available

SECTION 10: Stability and reactivity

10.1. Reactivity

This material is considered to be non-reactive under normal use conditions.

10.2. Chemical stability

The product is chemically stable under recommended conditions of storage, use and temperature.

10.3. Possibility of hazardous reactions

No known hazardous reactions.

10.4. Conditions to avoid

Heat

Light

Humidity

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10.5. Incompatible materials

Oxidizing agent

Acid, concentrated, hydrochloric acid, Acid chlorides, inorganic

10.6. Hazardous decomposition products

No known hazardous decomposition products.

SECTION 11: Toxicological information

11.1. Information on hazard classes as defined in Regulation (EC) No. 1272/2008

Acute oral toxicity:

Based on available data, the classification criteria are not met.

Acute dermal toxicity:

Based on available data, the classification criteria are not met.

Acute inhalation toxicity:

Based on available data, the classification criteria are not met.

Skin corrosion/irritation:

Causes skin irritation.

Self-classification

Serious eye damage/irritation:

Causes serious eye irritation.

Self-classification

Respiratory or skin sensitisation:

Based on available data, the classification criteria are not met.

Germ cell mutagenicity:

Based on available data, the classification criteria are not met.

Carcinogenicity:

Based on available data, the classification criteria are not met.

Reproductive toxicity:

Based on available data, the classification criteria are not met.

STOT-single exposure:

Based on available data, the classification criteria are not met.

STOT-repeated exposure:

Based on available data, the classification criteria are not met.

Aspiration hazard:

Based on available data, the classification criteria are not met.

Additional information:

No data available

11.2. Information on other hazards

Endocrine disrupting properties:

This substance does not have endocrine disrupting properties with respect to humans.

SECTION 12: Ecological information

12.1. Toxicity

L-Citrulline CAS No.: 372-75-8 EC No.: 206-759-6
LC₅₀: >1,000 mg/L (fish) EpiSuite QSAR tool
EC₅₀: >1,000 mg/L (Algae/water plant) EpiSuite QSAR tool

Aquatic toxicity:

No further relevant information available.

Effects in sewage plants:

Technically correct releases of minimal concentrations to adapted biological sewage plants, will not disturb the biodegradability of activated sludge.

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12.2. Persistence and degradability

L-Citrulline CAS No.: 372-75-8 EC No.: 206-759-6

Biodegradation: Yes, rapidly

12.3. Bioaccumulative potential

L-Citrulline CAS No.: 372-75-8 EC No.: 206-759-6

Log K_{ow}: -3.19

12.4. Mobility in soil

No data available

12.5. Results of PBT and vPvB assessment

L-Citrulline CAS No.: 372-75-8 EC No.: 206-759-6

Results of PBT and vPvB assessment: This substance does not meet the PBT/vPvB criteria of REACH, Annex XIII.

12.6. Endocrine disrupting properties

This substance does not have endocrine disrupting properties with respect to non-target organisms.

12.7. Other adverse effects

No data available

SECTION 13: Disposal considerations

13.1. Waste treatment methods

13.1.1. Product/Packaging disposal

Waste codes/waste designations according to EWC/AVV

Waste code product

16 03 05 * organic wastes containing hazardous substances

*: Evidence for disposal must be provided.

Directive 2008/98/EC (Waste Framework Directive)

HP 4 Irritant — skin irritation and eye damage

Waste treatment options

Appropriate disposal / Product:

Consult the appropriate local waste disposal expert about waste disposal.

SECTION 14: Transport information

Land transport (ADR/RID)	Inland waterway craft (ADN)	Sea transport (IMDG)	Air transport (ICAO-TI / IATA-DGR)
14.1. UN number or ID number			
No dangerous good in sense of these transport regulations.	No dangerous good in sense of these transport regulations.	No dangerous good in sense of these transport regulations.	No dangerous good in sense of these transport regulations.
14.2. UN proper shipping name			
No dangerous good in sense of these transport regulations.	No dangerous good in sense of these transport regulations.	No dangerous good in sense of these transport regulations.	No dangerous good in sense of these transport regulations.
14.3. Transport hazard class(es)			
not relevant	not relevant	not relevant	not relevant
14.4. Packing group			
not relevant	not relevant	not relevant	not relevant
14.5. Environmental hazards			
not relevant	not relevant	not relevant	not relevant
14.6. Special precautions for user			
not relevant	not relevant	not relevant	not relevant

14.7. Maritime transport in bulk according to IMO instruments

No data available

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SECTION 15: Regulatory information

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

15.1.1. EU legislation

Other regulations (EU):

This product is not assigned to a hazard category.

15.1.2. National regulations

[DE] National regulations

Störfallverordnung (12. BImSchV)

for substances contained in the product:

This product is not assigned to a hazard category.

Water hazard class

WGK:

1 - slightly hazardous to water

15.2. Chemical Safety Assessment

For this substance a chemical safety assessment has not been carried out.

SECTION 16: Other information

16.1. Indication of changes

No data available

16.2. Abbreviations and acronyms

ADN	European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways
ADR	European Agreement concerning the International Carriage of Dangerous Goods by Road
CAS	Chemical Abstracts Service
CLP	Classification, Labelling and Packaging
DIN	German Institute for Standardization / German Industrial Standard
EC ₅₀	Effective Concentration 50%
EN	European Standard
ICAO	International Civil Aviation Organization
IMDG	International Maritime Dangerous Goods
IMO	International Maritime Organization
ISO	International Standards Organisation
LC ₅₀	Lethal (fatal) Concentration 50%
NFPA	National Fire Protection Association
PBT	persistent and bioaccumulative and toxic
QSAR	Quantitative Structure-Activity Relationship
REACH	Registration, Evaluation and Authorization of Chemicals
RID	Dangerous goods regulations for transport by rail
TRGS	Technische Regeln für Gefahrstoffe
UN	United Nations

16.3. Key literature references and sources for data

REACH Dissemination Portal

Old: <https://echa.europa.eu/de/information-on-chemicals/registered-substances>

New: <https://chem.echa.europa.eu>

16.4. Classification for mixtures and used evaluation method according to regulation (EC) No. 1272/2008 [CLP]

Hazard classes and hazard categories	Hazard statements	Classification procedure
Skin corrosion/irritation (<i>Skin Irrit. 2</i>)	H315: Causes skin irritation.	Self-classification
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16.5. List of relevant hazard statements and/or precautionary statements from sections 2 to 15

Hazard statements	
H315	Causes skin irritation.
H319	Causes serious eye irritation.

16.6. Training advice

No data available

16.7. Additional information

No data available