Safety Data Sheet

20 Mix amino acids in water

Version：V2.0.0.1
Report No.：BWQ0663-2016-MSDS-EP
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*Prepared in accordance with EU REACH Regulation (REACH 1907/2006 with amendment 2020/878)

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

1.1 Product identifier

Product Name	20 Mix amino acids in water
Cat No.	BWQ0663-2016
CAS No.	Not applicable
EC No.	Not applicable
Molecular Formula	Not applicable
REACH Registration Number	-
UFI	No information available

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

Relevant identified uses	Please consult manufacturer.
Uses advised against	Please consult manufacturer.

1.3 Details of the supplier of the Safety Data Sheet

Name of the company	Weiyel Inc
Address of the company	Hedian Light Industrial Park, Chengguan Town, Shangcheng County, Xinyang City, Henan Province, China
Post code	465350
Telephone number	010-58103678
Fax number	010-84840368
E-mail address	info@weiyel.com

1.4 Emergency telephone number

Emergency telephone number	010-58103678
Opening hours	24h

2 Hazards identification

2.1 CLP classification according to Regulation (EC) No. 1272/2008 with amendment 2023/707

According to Regulation (EC) No 1272/2008 and its amendments. Not classified as a dangerous substance.

2.2 Label elements

Hazard pictograms	Not applicable
Signal word	Not applicable

Hazard statements

EUH208	Contains sensitising substance. May produce an allergic reaction

Precautionary statements

◆ Prevention

Prevention	Not applicable

◆ Response

Response	Not applicable

◆ Storage

Storage	Not applicable

◆ Disposal

Disposal	Not applicable

2.3 Other hazards

◆ Results of PBT and vPvB assessment

Component	Results of PBT and vPvB assessment [according to (EC) No 1907/2006]
Water	Insufficient information, temporarily unable to evaluate
L-alanine	Not PBT/vPvB
Arginine	Not PBT/vPvB
Asparagine	Not PBT/vPvB
Aspartic acid	Not PBT/vPvB
Cystine	Not PBT/vPvB
4-aminobutyric acid	Not PBT/vPvB
Glutamic acid	Insufficient information, temporarily unable to evaluate
Glycine	Not PBT/vPvB
Histidine	Not PBT/vPvB
L-isoleucine	Not PBT/vPvB
L-leucine	Not PBT/vPvB
L-lysine	Insufficient information, temporarily unable to evaluate
L-methionine	Not PBT/vPvB
L-PHENYLALANINE	Insufficient information, temporarily unable to evaluate
L-proline	Not PBT/vPvB
L-serine	Not PBT/vPvB
N-ethyl-L-glutamine	Insufficient information, temporarily unable to evaluate
L-threonine	Not PBT/vPvB
Tyrosine	Insufficient information, temporarily unable to evaluate
L-valine	Not PBT/vPvB

◆ Results of endocrine disrupting properties assessment

Component	Results of endocrine disrupting properties assessment [according to (EU) No 2017/2100 or (EU) No 2018/605]

Water	Insufficient information, temporarily unable to evaluate
L-alanine	Insufficient information, temporarily unable to evaluate
Arginine	Insufficient information, temporarily unable to evaluate
Asparagine	Insufficient information, temporarily unable to evaluate
Aspartic acid	Insufficient information, temporarily unable to evaluate
Cystine	Insufficient information, temporarily unable to evaluate
4-aminobutyric acid	Insufficient information, temporarily unable to evaluate
Glutamic acid	Insufficient information, temporarily unable to evaluate
Glycine	Insufficient information, temporarily unable to evaluate
Histidine	Insufficient information, temporarily unable to evaluate
L-isoleucine	Insufficient information, temporarily unable to evaluate
L-leucine	Insufficient information, temporarily unable to evaluate
L-lysine	Insufficient information, temporarily unable to evaluate
L-methionine	Insufficient information, temporarily unable to evaluate
L-PHENYLALANINE	Insufficient information, temporarily unable to evaluate
L-proline	Insufficient information, temporarily unable to evaluate
L-serine	Insufficient information, temporarily unable to evaluate
N-ethyl-L-glutamine	Insufficient information, temporarily unable to evaluate
L-threonine	Insufficient information, temporarily unable to evaluate
Tyrosine	Insufficient information, temporarily unable to evaluate
L-valine	Insufficient information, temporarily unable to evaluate

◆ Other

	Not applicable.

3 Composition/information on ingredients

3.1 Substance

	Not applicable

3.2 Mixture

Component	Weight % content(or range)	Classification according to Regulation (EC) No. 1272/2008 with amendment 2023/707 [CLP]	Specific Conc. Limits, M-factors
Water CAS : 7732-18-5 EC : 231-791-2 Index No. : -	99.4	Not Classified	-
L-alanine CAS : 56-41-7 EC : 200-273-8 Index No. : -	0.03	No information available	-
Arginine CAS : 74-79-3 EC : 200-811-1 Index No. : -	0.03	Serious eye damage/irritation, Category 2, H319	-

Asparagine CAS : 70-47-3 EC : 200-735-9 Index No. : -	0.03	Not Classified	-
Aspartic acid CAS : 56-84-8 EC : 200-291-6 Index No. : -	0.03	Serious eye damage/irritation, Category 2, H319	-
Cystine CAS : 56-89-3 EC : 200-296-3 Index No. : -	0.03	Not Classified	-
4-aminobutyric acid CAS : 56-12-2 EC : 200-258-6 Index No. : -	0.03	Not Classified	-
Glutamic acid CAS : 56-86-0 EC : 200-293-7 Index No. : -	0.03	Serious eye damage/irritation, Category 2, H319	-
Glycine CAS : 56-40-6 EC : 200-272-2 Index No. : -	0.03	Not Classified	-
Histidine CAS : 71-00-1 EC : 200-745-3 Index No. : -	0.03	Acute Toxicity - Oral, Category 4, H302; Skin Corrosion/Irritation, Category 2, H315; Serious eye damage/irritation, Category 2, H319; Acute Toxicity - Inhalation, Category 4, H332	-
L-isoleucine CAS : 73-32-5 EC : 200-798-2 Index No. : -	0.03	Not Classified	-
L-leucine CAS : 61-90-5 EC : 200-522-0 Index No. : -	0.03	Not Classified	-
L-lysine CAS : 56-87-1 EC : 200-294-2 Index No. : -	0.03	Skin Corrosion/Irritation, Category 2, H315; Serious eye damage/irritation, Category 2, H319; Specific target organ toxicity - single exposure; respiratory tract irritation, Category 3, H335	-
L-methionine CAS : 63-68-3 EC : 200-562-9 Index No. : -	0.03	Not Classified	-
L-PHENYLALANINE CAS : 15099-85-1 EC : 200-568-1 Index No. : -	0.03	Skin corrosion/irritation, Category 1B, H314; Serious eye damage/irritation, Category 2, H319; Specific target organ toxicity - single exposure; respiratory tract irritation, Category 3, H335	-
L-proline CAS : 147-85-3 EC : 205-702-2 Index No. : -	0.03	Not Classified	-
L-serine CAS : 56-45-1 EC : 200-274-3 Index No. : -	0.03	Hazardous to the aquatic environment - long-term (chronic) hazard, Category 3, H412	-
N-ethyl-L-glutamine CAS : 3081-61-6	0.03	Sensitization - skin, Category 1A, H317	-

EC : 221-379-0 Index No. : -			
L-threonine CAS : 72-19-5 EC : 200-774-1 Index No. : -	0.03	Not Classified	-
Tyrosine CAS : 60-18-4 EC : 200-460-4 Index No. : -	0.03	Not Classified	-
L-valine CAS : 72-18-4 EC : 200-773-6 Index No. : -	0.03	Not Classified	-

4 First-aid measures

4.1 Description of first aid measures

General advice	Immediate medical attention is required. Show this safety data sheet (SDS) to the doctor in attendance.
Eye contact	Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician if feel uncomfortable.
Skin contact	Take off contaminated clothing and shoes immediately. Wash off with plenty of soap and water for at least 15 minutes and consult a physician if feel uncomfortable.
Ingestion	Never give anything by mouth to an unconscious person. Call a physician or Poison Control Center immediately.
Inhalation	Move victim into fresh air. If breathing is difficult, give oxygen. Do not use mouth to mouth resuscitation if victim ingested or inhaled the substance. If not breathing, give artificial respiration and consult a physician immediately.
Protecting of first-aiders	Ensure that medical personnel are aware of the substance involved. Take precautions to protect themselves and prevent spread of contamination.

4.2 Most important symptoms/effects, acute and delayed

1	Substance accumulation, in the human body, may occur and may cause some concern following repeated or long-term occupational exposure.

4.3 Indication of any immediate medical attention and special treatment needed

1	Treat symptomatically.
2	Symptoms may be delayed.

5 Fire-fighting measures

5.1 Extinguishing media

Suitable extinguishing media	Use extinguishing media suitable for surrounding area.
Unsuitable extinguishing media	There is no restriction on the type of extinguisher which may be used.

5.2 Specific hazards arising from the substance or mixture

1	Development of hazardous combustion gases or vapor possible in the event of fire.
2	May expansion or decompose explosively when heated or involved in fire.

5.3 Advice for firefighters

1	As in any fire, wear self-contained breathing apparatus (MSHA/NIOSH approved or equivalent) and full

	protective gear.
2	Fight fire from a safe distance, with adequate cover.
3	Prevent fire extinguishing water from contaminating surface water or the ground water system.

6 Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

1	Use personal protective equipment,do not breathe gas/mist/vapour/spray.
2	Ensure adequate ventilation. Remove all sources of ignition. Take precautionary measures against static discharges.
3	Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak.

6.2 Environmental precautions

1	Prevent further leakage or spillage if safe to do so.
2	Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up

1	Cut off the source of the leak as much as possible.
2	Keep leaks in a ventilated place.
3	Absorb spilled material in dry sand or inert absorbent. In case of large amount of spillage, contain a spill by bunding.
4	Adhered or collected material should be promptly disposed of, in accordance with appropriate laws and regulations.
5	Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container.

6.4 Reference to other sections

1	Personal Protective Equipment advice is contained in Section 8 of the SDS.
2	Disposal considerations advice is contained in Section 13 of the SDS.

7 Handling and storage

7.1 Precautions for safe handling

◆ Protective measures

1	Handling is performed in a well ventilated place.
2	Wear suitable protective equipment.
3	Avoid contact with skin and eyes.

◆ Measures to prevent fire

1	Keep away from heat/sparks/open flames/ hot surfaces.

◆ Measures to prevent aerosol and dust generation

1	Not applicable.

◆ Advice on general occupational hygiene

1	Wash hands and face after using the substances.
2	Replace the contaminated clothing immediately.

7.2 Conditions for safe storage, including any incompatibilities

1	Keep containers tightly closed.
2	Keep containers in a dry, cool and well-ventilated place.

3	Keep away from heat/sparks/open flames/hot surfaces.
4	Store away from incompatible materials and foodstuff containers.

7.3 Specific end use(s)

1	In addition to use mentioned in the Section 1.2, unforeseen other specific end uses.

8 Exposure controls/personal protection

8.1 Control parameters

◆Occupational exposure limit values

Occupational Exposure limit values	No relevant regulations

◆ Biological limit values

Biological limit values	No relevant regulations

◆ Monitoring methods

1	EN 14042 Workplace atmospheres. Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents.
2	GBZ/T 300 and GBZ/T 160 series standard Determination of toxic substances in workplace air.

◆ Derived No effect level (DNEL)

Component	Route of exposure	DNEL for Workers			
		Acute effects (local)	Acute effects (systemic)	Chronic effects (local)	Chronic effects (systemic)
Water	Inhalation	No data available	No data available	No data available	No data available
	Oral	No data available	No data available	No data available	No data available
	Dermal	No data available	No data available	No data available	No data available
L-alanine	Inhalation	No data available	No data available	No data available	226.2 mg/m3
	Oral	No data available	No data available	No data available	No data available
	Dermal	No data available	No data available	No data available	No data available
Arginine	Inhalation	No data available	No data available	No data available	552 mg/m3
	Oral	No data available	No data available	No data available	No data available
	Dermal	No data available	No data available	No data available	No data available
Asparagine	Inhalation	No data available	No data available	No data available	81.4 mg/m3
	Oral	No data available	No data available	No data available	No data available
	Dermal	No data available	No data available	No data available	No data available
Aspartic acid	Inhalation	No data available	No data available	No data available	206 mg/m3
	Oral	No data available	No data available	No data available	No data available
	Dermal	No data available	No data available	No data available	No data available
Cystine	Inhalation	No data available	No data available	No data available	No data available
	Oral	No data available	No data available	No data available	No data available
	Dermal	No data available	No data available	No data available	No data available
4-aminobutyric acid	Inhalation	No data available	No data available	No data available	No data available
	Oral	No data available	No data available	No data available	No data available

	Dermal	No data available	No data available	No data available	No data available
Glutamic acid	Inhalation	No data available	No data available	No data available	10 mg/m3
	Oral	No data available	No data available	No data available	No data available
	Dermal	No data available	No data available	No data available	No data available
Glycine	Inhalation	No data available	No data available	No data available	No data available
	Oral	No data available	No data available	No data available	No data available
	Dermal	No data available	No data available	No data available	No data available
Histidine	Inhalation	No data available	No data available	No data available	83.38 mg/m3
	Oral	No data available	No data available	No data available	No data available
	Dermal	No data available	No data available	No data available	No data available
L-isoleucine	Inhalation	No data available	No data available	No data available	52.89 mg/m3
	Oral	No data available	No data available	No data available	No data available
	Dermal	No data available	No data available	No data available	No data available
L-leucine	Inhalation	No data available	No data available	No data available	293.5 mg/m3
	Oral	No data available	No data available	No data available	No data available
	Dermal	No data available	No data available	No data available	No data available
L-lysine	Inhalation	No data available	No data available	No data available	No data available
	Oral	No data available	No data available	No data available	No data available
	Dermal	No data available	No data available	No data available	No data available
L-methionine	Inhalation	No data available	No data available	No data available	110.4 mg/m3
	Oral	No data available	No data available	No data available	No data available
	Dermal	No data available	No data available	No data available	No data available
L-PHENYLALANINE	Inhalation	No data available	No data available	No data available	No data available
	Oral	No data available	No data available	No data available	No data available
	Dermal	No data available	No data available	No data available	No data available
L-proline	Inhalation	No data available	No data available	No data available	488.9 mg/m3
	Oral	No data available	No data available	No data available	No data available
	Dermal	No data available	No data available	No data available	No data available
L-serine	Inhalation	No data available	No data available	No data available	529 mg/m3
	Oral	No data available	No data available	No data available	No data available
	Dermal	No data available	No data available	No data available	No data available
N-ethyl-L-glutamine	Inhalation	No data available	No data available	No data available	No data available
	Oral	No data available	No data available	No data available	No data available
	Dermal	No data available	No data available	No data available	No data available
L-threonine	Inhalation	No data available	No data available	No data available	158 mg/m3
	Oral	No data available	No data available	No data available	No data available
	Dermal	No data available	No data available	No data available	No data available

Tyrosine	Inhalation	No data available	No data available	No data available	No data available
	Oral	No data available	No data available	No data available	No data available
	Dermal	No data available	No data available	No data available	No data available
L-valine	Inhalation	No data available	No data available	No data available	110.7 mg/m3
	Oral	No data available	No data available	No data available	No data available
	Dermal	No data available	No data available	No data available	No data available

◆ Predicted No Effect Concentration (PNEC)

Component	A	B	C	D	E	F	G	H
L-alanine	No hazard identified	No hazard identified	50 mg/L	No hazard identified	No hazard identified	No hazard identified	No hazard identified	No potential to cause toxic effects if accumulated (in higher organisms) via the food chain
Arginine	1.8 mg/L	180 µg/L	10 g/L	3.663 mg/kg sediment dw	366 µg/kg sediment dw	No hazard identified	No hazard identified	No potential to cause toxic effects if accumulated (in higher organisms) via the food chain
Asparagine	No hazard identified	No hazard identified	50 mg/L	No hazard identified	No hazard identified	No hazard identified	No hazard identified	No potential for bioaccumulation
Aspartic acid	100 µg/L	10 µg/L	3.4 mg/L	80 µg/kg sediment dw	8 µg/kg sediment dw	No hazard identified	20 µg/kg soil dw	No potential for bioaccumulation
Cystine	No hazard identified	No hazard identified	No hazard identified	No hazard identified	No hazard identified	No hazard identified	No hazard identified	No potential for bioaccumulation
Glutamic acid	No hazard identified	No data available	No data available	No data available	No data available	No hazard identified	No hazard identified	No potential for bioaccumulation

Glycine	No hazard identified	No hazard identified	No hazard identified	No hazard identified	No hazard identified	No hazard identified	No hazard identified	No potential for bioaccumulation
Histidine	100 µg/L	10 µg/L	20.5 mg/L	392 µg/kg sediment dw	39.2 µg/kg sediment dw	No hazard identified	19.7 µg/kg soil dw	No potential for bioaccumulation
L-isoleucine	No hazard identified	No hazard identified	No hazard identified	No hazard identified	No hazard identified	No hazard identified	No hazard identified	No potential for bioaccumulation
L-leucine	10 mg/L	1 mg/L	10 g/L	20.391 mg/kg sediment dw	2.039 mg/kg sediment dw	No hazard identified	No hazard identified	No potential to cause toxic effects if accumulated (in higher organisms) via the food chain
L-methionine	162 µg/L	16.2 µg/L	1 g/L	585 µg/kg sediment dw	58.5 µg/kg sediment dw	No hazard identified	22 µg/kg soil dw	No potential for bioaccumulation
L-proline	No hazard identified	No hazard identified	50 mg/L	No hazard identified	No hazard identified	No hazard identified	No hazard identified	No potential to cause toxic effects if accumulated (in higher organisms) via the food chain
L-serine	No hazard identified	No hazard identified	50 mg/L	No hazard identified	No hazard identified	No hazard identified	No hazard identified	No potential for bioaccumulation
L-threonine	No hazard identified	No hazard identified	No data available	No hazard identified	No hazard identified	No hazard identified	No hazard identified	No potential for bioaccumulation
L-valine	10 mg/L	1 mg/L	10 g/L	20.391 mg/kg sediment dw	2.039 mg/kg sediment dw	No hazard identified	No hazard identified	No potential to cause toxic effects if accumulated (in higher

								organisms) via the food chain

Note 1:

A: Freshwater; B: Seawater; C: Sewage treatment plant; D: Sediment (freshwater); E: Sediment (seawater); F: Air; G: Soil; H: Secondary poisoning(Hazard for Predators).

Note 2:

The PNEC values of the remaining components not shown in the product are not available yet.

8.2 Exposure controls

8.2.1 Engineering controls

1	Ensure adequate ventilation, especially in confined areas.
2	Ensure that eyewash stations and safety showers are close to the workstation location.
3	Use explosion-proof electrical/ventilating/lighting/equipment.
4	Set up emergency exit and necessary risk-elimination area.

8.2.2 Personal protection equipment

General requirement	
Eye protection	Must wear appropriate safety goggles.
Hand protection	Must wear appropriate chemical protective gloves.
Respiratory protection	Must wear appropriate personal respiratory protective equipment.
Skin and body protection	Must wear appropriate chemical protective clothing and chemical resistant shoes.

8.2.3 Environmental exposure controls

Environmental exposure controls	No information available

9 Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state	Clear, colorless liquid
Colour	Clear, colorless liquid
Odor	No information available
Odor threshold	No information available
pH	7.00 (20°C,Water)
Melting point/freezing point(°C)	0 (Water)
Initial boiling point and boiling range(°C)	100 (Water)
Flash point(Closed cup,°C)	No information available
Evaporation rate	No information available
Flammability	No information available
Upper/lower explosive limits[%(v/v)]	Upper limit : No information available ; Lower limit : No information available
Vapor pressure	2.33kPa (20°C,Water)

Vapor density(Air = 1)	> 1 (Water)
Relative density(Water=1)	1 (3.9°C,Water)
Solubility	No information available
n-octanol/water partition coefficient	No information available
Auto-ignition temperature(°C)	No information available
Decomposition temperature(°C)	No information available
Kinematic viscosity	No information available
Explosive properties	No information available
Oxidizing properties	No information available
Particle characteristics	Not applicable

9.2 Other information

9.2.1 Information with regard to physical hazard classes

Information with regard to physical hazard classes	No information available

9.2.2 Other safety characteristics

Other safety characteristics	No information available

10 Stability and reactivity

Stability and reactivity

10.1 Reactivity	Contact with incompatible substances can cause decomposition or other chemical reactions.
10.2 Chemical stability	Stable under proper operation and storage conditions.
10.3 Possibility of hazardous reactions	In contact with active metals (alkali metals, Na, Ca etc.) causes a reaction and release hydrogen.
10.4 Conditions to avoid	Incompatible materials, heat, flame and spark.
10.5 Incompatible materials	Alkali, sodium, calcium, and other active metal, halogen, metal oxide, nonmetal oxide, acyl halide and metal phosphide.
10.6 Hazardous decomposition products	Under normal conditions of storage and use, hazardous decomposition products should not be produced.

11 Toxicological information

11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008 with amendment 2023/707

20 Mix amino acids in water	
Skin corrosion/irritation	Based on available data, the classification criteria are not met
Serious eye damage/irritation	Based on available data, the classification criteria are not met
Skin sensitization	Based on available data, the classification criteria are not met
Respiratory sensitization	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
Germ cell mutagenicity	Based on available data, the classification criteria are not met

Acute toxicity

Component	LD_{50}(oral)	LD_{50}(dermal)	LC_{50}(inhalation,4h)
Glutamic acid	> 30000mg/kg(Rat)	No information available	No information available
Glycine	7930mg/kg(Rat)	No information available	No information available
Histidine	> 15000mg/kg(Rat)	No information available	No information available
L-methionine	36000mg/kg(Rat)	No information available	No information available
4-aminobutyric acid	12680mg/kg(Mouse)	No information available	No information available

Carcinogenicity

Component	List of carcinogens by the IARC Monographs	Report on Carcinogens by NTP
Water	Not Listed	Not Listed
L-alanine	Not Listed	Not Listed
Arginine	Not Listed	Not Listed
Asparagine	Not Listed	Not Listed
Aspartic acid	Not Listed	Not Listed
Cystine	Not Listed	Not Listed
4-aminobutyric acid	Not Listed	Not Listed
Glutamic acid	Not Listed	Not Listed
Glycine	Not Listed	Not Listed
Histidine	Not Listed	Not Listed
L-isoleucine	Not Listed	Not Listed
L-leucine	Not Listed	Not Listed
L-lysine	Not Listed	Not Listed
L-methionine	Not Listed	Not Listed
L-PHENYLALANINE	Not Listed	Not Listed
L-proline	Not Listed	Not Listed
L-serine	Not Listed	Not Listed
N-ethyl-L-glutamine	Not Listed	Not Listed
L-threonine	Not Listed	Not Listed
Tyrosine	Not Listed	Not Listed
L-valine	Not Listed	Not Listed

11.2 Information on other hazards

11.2.1 Endocrine disrupting properties

Component	Endocrine disrupting properties
Water	No information available
L-alanine	No information available

Arginine	No information available
Asparagine	No information available
Aspartic acid	No information available
Cystine	No information available
4-aminobutyric acid	No information available
Glutamic acid	No information available
Glycine	No information available
Histidine	No information available
L-isoleucine	No information available
L-leucine	No information available
L-lysine	No information available
L-methionine	No information available
L-PHENYLALANINE	No information available
L-proline	No information available
L-serine	No information available
N-ethyl-L-glutamine	No information available
L-threonine	No information available
Tyrosine	No information available
L-valine	No information available

11.2.2 Other Information

Other Information	See Section 11.1

12 Ecological information

12.1 Toxicity

Acute aquatic toxicity

Component	Fish	Crustaceans	Algae or other aquatic plants
Glutamic acid	LC_{50} : > 100mg/L (96h)(Fish)	EC_{50} : > 83.14mg/L (48h)(Crustaceans)	ErC_{50} : 68.5mg/L (72h)(Algae)
Tyrosine	No information available	EC_{50} : > 100mg/L (48h)(Crustaceans)	ErC_{50} : > 63.2mg/L (72h)(Algae)
Arginine	LC_{50} : 2800mg/L (96h)(Fish)	No information available	No information available
L-isoleucine	LC_{50} : > 11200mg/L (96h)(Fish)	No information available	No information available
Glycine	LC_{50} : 1000mg/L (96h)(Fish)	No information available	No information available
L-proline	LC_{50} : 10500mg/L (96h)(Fish)	No information available	No information available
Histidine	No information available	EC_{50} : > 100mg/L (48h)(Crustaceans)	ErC_{50} : > 100mg/L (72h)(Algae)

Aspartic acid	LC_{50} :113mg/L (96h)(Fish)	No information available	No information available
L-alanine	LC_{50} : 26300mg/L (96h)(Fish)	No information available	No information available
L-methionine	LC_{50} : 1600mg/L (96h)(Fish)	No information available	No information available
Asparagine	LC_{50} : 1690000mg/L (96h)(Fish)	No information available	No information available

Chronic aquatic toxicity

Chronic aquatic toxicity	No information available

12.2 Persistence and degradability

Component	Persistence (water/soil)	Persistence (air)
L-alanine	Low	Low
Arginine	Low	Low
Asparagine	Low	Low
Aspartic acid	Low	Low
4-aminobutyric acid	Low	Low
Glutamic acid	Low	Low
Glycine	Low	Low
Histidine	High	High
L-isoleucine	High	High
L-leucine	High	High
L-proline	Low	Low
L-serine	Low	Low
L-threonine	Low	Low
Tyrosine	High	High
L-valine	High	High

12.3 Bioaccumulative potential

Component	Bioaccumulative potential	Comments
L-alanine	Low	Log Kow=-2.9904
Arginine	Low	Log Kow=-4.2
Asparagine	Low	Log Kow=-3.82
Aspartic acid	Low	Log Kow=-3.89
4-aminobutyric acid	Low	Log Kow=-3.17
Glutamic acid	Low	Log Kow=-3.69
Glycine	Low	Log Kow=-3.21
Histidine	Low	Log Kow=-3.32
L-isoleucine	Low	Log Kow=-1.7

L-leucine	Low	Log Kow=-1.52
L-lysine	Low	Log Kow=-3.05
L-proline	Low	Log Kow=-2.54
L-serine	Low	Log Kow=-3.07
L-threonine	Low	Log Kow=-2.94
Tyrosine	Low	Log Kow=-1.7628
L-valine	Low	Log Kow=-2.26

12.4 Mobility in soil

Component	log Koc	Remark
L-alanine	-1.44	20 ℃
Arginine	1.319	
Asparagine	0.083	
Aspartic acid	-0.58	20 ℃
4-aminobutyric acid	0.487	
Glutamic acid	-1.92082	
Glycine	0.000	
Histidine	-1.304	log Kow method
L-isoleucine	-0.817	log Kow method
L-leucine	-0.707	log Kow method
L-proline	-1.29	20 ℃
L-serine	-1.976	
L-threonine	0.000	
Tyrosine	1.987	
L-valine	-1.11	20 ℃

12.5 Results of PBT and vPvB assessment

Component	Results of PBT and vPvB assessment [according to (EC) No 1907/2006]
Water	Insufficient information, temporarily unable to evaluate
L-alanine	Not PBT/vPvB
Arginine	Not PBT/vPvB
Asparagine	Not PBT/vPvB
Aspartic acid	Not PBT/vPvB
Cystine	Not PBT/vPvB
4-aminobutyric acid	Not PBT/vPvB
Glutamic acid	Insufficient information, temporarily unable to evaluate
Glycine	Not PBT/vPvB
Histidine	Not PBT/vPvB

L-isoleucine	Not PBT/vPvB
L-leucine	Not PBT/vPvB
L-lysine	Insufficient information, temporarily unable to evaluate
L-methionine	Not PBT/vPvB
L-PHENYLALANINE	Insufficient information, temporarily unable to evaluate
L-proline	Not PBT/vPvB
L-serine	Not PBT/vPvB
N-ethyl-L-glutamine	Insufficient information, temporarily unable to evaluate
L-threonine	Not PBT/vPvB
Tyrosine	Insufficient information, temporarily unable to evaluate
L-valine	Not PBT/vPvB

12.6 Endocrine disrupting properties

Component	Endocrine disrupting properties
Water	No information available
L-alanine	No information available
Arginine	No information available
Asparagine	No information available
Aspartic acid	No information available
Cystine	No information available
4-aminobutyric acid	No information available
Glutamic acid	No information available
Glycine	No information available
Histidine	No information available
L-isoleucine	No information available
L-leucine	No information available
L-lysine	No information available
L-methionine	No information available
L-PHENYLALANINE	No information available
L-proline	No information available
L-serine	No information available
N-ethyl-L-glutamine	No information available
L-threonine	No information available
Tyrosine	No information available
L-valine	No information available

12.7 Other adverse effects

	No information available

13 Disposal considerations

13.1 Waste treatment methods

Waste chemicals	Before disposal should refer to the relevant national and local laws and regulation. Recommend the use of incineration disposal.
Contaminated packaging	Containers may still present chemical hazard when empty. Keep away from hot and ignition source of fire. Return to supplier for recycling if possible.
Disposal recommendations	Refer to section waste chemicals and contaminated packaging.

14 Transport information

Label and Mark

Transporting Label	Not applicable

IMDG-CODE

IMDG-CODE	NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS

IATA-DGR

IATA-DGR	NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS

UN-ADR

UN-ADR	NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS

Special precautions for user

	Transport vehicles should be equipped with the appropriate variety and quantity of fire equipment and emergency equipment leakage during transport. Before transport, should be preceded by checking whether container integrity, sealing. The transport unit must be placarded and marked in accordance with relevant transporting requirements.

Maritime transport in bulk according to IMO instruments

◆Transport in bulk according to Annex II of MARPOL and the IBC code

	Not Available

◆Transport in bulk in accordance with MARPOL Annex V and the IMSBC Code

	Not Available

◆Transport in bulk in accordance with the IGC Code

	Not Available

15 Regulatory information

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

International chemical inventory

Component	A	B	C	D	E	F	G	H	I	J	K	L	M
Water	√	√	√	√	√	√	√	√	√	√	√	√	√
L-alanine	√	√	√	√	√	√	√	√	√	√	√	√	√
Arginine	√	√	√	√	√	√	√	√	√	×	√	√	√
Asparagine	√	√	√	√	√	√	√	√	√	×	×	√	√

Aspartic acid	√	√	√	√	√	√	√	√	√	×	√	√	√
Cystine	√	√	√	√	√	√	√	√	√	×	×	√	√
4-aminobutyric acid	√	√	√	×	√	√	×	√	√	×	√	√	√
Glutamic acid	√	√	√	√	√	√	√	√	√	√	√	√	√
Glycine	√	√	√	√	√	√	√	√	√	√	√	√	√
Histidine	√	√	√	√	√	√	√	√	√	√	√	√	√
L-isoleucine	√	√	√	√	√	√	√	√	√	√	√	√	√
L-leucine	√	√	√	√	√	√	×	√	√	×	√	√	√
L-lysine	√	√	√	√	√	√	√	√	√	×	√	√	√
L-methionine	√	√	√	√	√	√	√	√	√	×	√	√	√
L-PHENYLALANINE	×	×	×	×	×	×	×	×	×	×	×	×	×
L-proline	√	√	√	√	√	√	√	√	√	×	×	√	√
L-serine	√	√	√	√	√	√	√	√	√	√	√	√	√
N-ethyl-L-glutamine	×	√	×	×	×	×	×	×	×	×	√	√	√
L-threonine	√	√	√	√	√	√	√	√	√	√	√	√	√
Tyrosine	√	√	√	√	√	√	√	√	√	×	×	√	√
L-valine	√	√	√	√	√	√	√	√	√	√	√	√	√

【A】 China Inventory of Existing Chemical Substances(IECSC)
【B】 European Inventory of Existing Commercial Chemical Substances(EC inventory)
【C】 United States Toxic Substances Control Act Inventory(TSCA)
【D】 Canadian Domestic Substances List(DSL)
【E】 New Zealand Inventory of Chemicals(NZIoC)
【F】 Philippines Inventory of Chemicals and Chemical Substances(PICCS)
【G】 Korea Existing Chemicals Inventory(KECL)
【H】 Australian. Inventory of Industrial Chemical (AIICS)
【I】 Japan Inventory of Existing & New Chemical Substances(ENCS)
【J】 Thailand Existing Chemicals Inventory(TECI)
【K】 Mexico National Inventory of Chemical Substances (INSQ)
【L】 Russia Inventory of Existing Substances (DRAFT)
【M】 Inventory of Existing Chemical Substances in Taiwan, China (TCSI)

List of Chemical Substances under International Conventions

Component	A	B	C
Water	×	×	×
L-alanine	×	×	×
Arginine	×	×	×
Asparagine	×	×	×
Aspartic acid	×	×	×
Cystine	×	×	×
4-aminobutyric acid	×	×	×
Glutamic acid	×	×	×
Glycine	×	×	×

Histidine	×	×	×
L-isoleucine	×	×	×
L-leucine	×	×	×
L-lysine	×	×	×
L-methionine	×	×	×
L-PHENYLALANINE	×	×	×
L-proline	×	×	×
L-serine	×	×	×
N-ethyl-L-glutamine	×	×	×
L-threonine	×	×	×
Tyrosine	×	×	×
L-valine	×	×	×

【A】 The Montreal Protocol on Substances that Deplete the Ozone Layer
【B】 Stockholm Convention on Persistent Organic Pollutants (POPs)
【C】 Rotterdam Convention on the prior informed consent procedure for certain hazardous chemicals and pesticides in international trade

European chemical inventory

Component	A	B	C	D	E	F	G	H	I
Water	×	×	×	√	×	×	×	×	×
L-alanine	×	×	×	√	√	×	×	×	×
Arginine	×	×	×	√	√	×	×	×	×
Asparagine	×	×	×	√	√	×	×	×	×
Aspartic acid	×	×	×	√	√	×	×	×	×
Cystine	×	×	×	√	√	×	×	×	×
4-aminobutyric acid	×	×	×	√	√	×	×	×	×
Glutamic acid	×	×	×	√	√	×	×	×	×
Glycine	×	×	×	√	√	×	×	×	×
Histidine	×	×	×	√	√	×	×	×	×
L-isoleucine	×	×	×	√	√	×	×	×	×
L-leucine	×	×	×	√	√	×	×	×	×
L-lysine	×	×	×	√	×	×	×	×	×
L-methionine	×	×	×	√	√	×	×	×	×
L-PHENYLALANINE	×	×	×	×	×	×	×	×	×
L-proline	×	×	×	√	√	×	×	×	×
L-serine	×	×	×	√	√	×	×	×	×
N-ethyl-L-glutamine	×	×	×	√	×	×	×	×	×
L-threonine	×	×	×	√	√	×	×	×	×
Tyrosine	×	×	×	√	√	×	×	×	×

L-valine	×	×	×	√	√	×	×	×	×

[A] Candidate list of Substances of Very High Concern for authorization under EU REACH regulation
[B] Substances requiring authorisation under EU REACH regulation
[C] Substances restricted under EU REACH
[D] Pre-registered substances under EU REACH
[E] Registered substances under EU REACH
[F] Substance Evaluation – CoRAP under EU REACH
[G] List of priority substances under EU water policy （Directive 2455/2001/EC）
[H] Substances subject to POPs Regulation
[I] Substances proposed as POPs

Note:
"√" Indicates that the substance included in the regulations.
"×" No data or not included in the regulations.

German water hazard class(WGK)

Component	WGK	Remark
L-alanine	WGK 1	
Arginine	WGK 1	
Asparagine	WGK 1	
Aspartic acid	WGK 1	
Cystine	WGK 1	
Glutamic acid	WGK 1	
Glycine	WGK 1	
Histidine	WGK 1	
L-isoleucine	WGK 1	
L-leucine	WGK 1	
L-lysine	WGK 1	
L-methionine	WGK 1	
L-PHENYLALANINE	WGK 1	
L-proline	WGK 1	
L-serine	WGK 1	
L-threonine	WGK 1	
Tyrosine	WGK 1	
L-valine	WGK 1	

【WGK 1】 slightly hazardous to water
【WGK 2】 obviously hazardous to water
【WGK 3】 highly hazardous to water
【nwg】 non-hazardous to water
【awg】 hazardous to water in general

German technical instructions on air quality control(TA LUFT)

Component	TA LUFT	Remark
L-alanine	Chapter 5.2.5 Organic Substances, dust,including fine dust.To be treated	

	as overall dust. The emissions of dust in the exhaust gas are not allowed to exceed the following values:Mass flow:0,20 kg/hr or Mass conc.:20 mg/m³ The mass per unit volume of 0,15 g/m³ in exhaust gas is not allowed to be exceeded also on observance or lower deviation of a mass flow of 0,20 kg/h.For emission sources that exceed the mass flow rate of 0.40 kg/h, the mass concentration in waste gas the mass concentration must not exceed 10 mg/m³.	
Arginine	Chapter 5.2.5 Organic Substances, dust,including fine dust.To be treated as overall dust. The emissions of dust in the exhaust gas are not allowed to exceed the following values:Mass flow:0,20 kg/hr or Mass conc.:20 mg/m³ The mass per unit volume of 0,15 g/m³ in exhaust gas is not allowed to be exceeded also on observance or lower deviation of a mass flow of 0,20 kg/h.For emission sources that exceed the mass flow rate of 0.40 kg/h, the mass concentration in waste gas the mass concentration must not exceed 10 mg/m³.	
Asparagine	Chapter 5.2.5 Organic Substances, dust,including fine dust.To be treated as overall dust. The emissions of dust in the exhaust gas are not allowed to exceed the following values:Mass flow:0,20 kg/hr or Mass conc.:20 mg/m³ The mass per unit volume of 0,15 g/m³ in exhaust gas is not allowed to be exceeded also on observance or lower deviation of a mass flow of 0,20 kg/h.For emission sources that exceed the mass flow rate of 0.40 kg/h, the mass concentration in waste gas the mass concentration must not exceed 10 mg/m³.	
Aspartic acid	Chapter 5.2.5 Organic Substances, dust,including fine dust.To be treated as overall dust. The emissions of dust in the exhaust gas are not allowed to exceed the following values:Mass flow:0,20 kg/hr or Mass conc.:20 mg/m³ The mass per unit volume of 0,15 g/m³ in exhaust gas is not allowed to be exceeded also on observance or lower deviation of a mass flow of 0,20 kg/h.For emission sources that exceed the mass flow rate of 0.40 kg/h, the mass concentration in waste gas the mass concentration must not exceed 10 mg/m³.	

Cystine	Chapter 5.2.5 Organic Substances, dust,including fine dust.To be treated as overall dust. The emissions of dust in the exhaust gas are not allowed to exceed the following values:Mass flow:0,20 kg/hr or Mass conc.:20 mg/m³ The mass per unit volume of 0,15 g/m³ in exhaust gas is not allowed to be exceeded also on observance or lower deviation of a mass flow of 0,20 kg/h.For emission sources that exceed the mass flow rate of 0.40 kg/h, the mass concentration in waste gas the mass concentration must not exceed 10 mg/m³.	
Glutamic acid	Chapter 5.2.5 Organic Substances, dust,including fine dust.To be treated as overall dust. The emissions of dust in the exhaust gas are not allowed to exceed the following values:Mass flow:0,20 kg/hr or Mass conc.:20 mg/m³ The mass per unit volume of 0,15 g/m³ in exhaust gas is not allowed to be exceeded also on observance or lower deviation of a mass flow of 0,20 kg/h.For emission sources that exceed the mass flow rate of 0.40 kg/h, the mass concentration in waste gas the mass concentration must not exceed 10 mg/m³.	
Glycine	Chapter 5.2.5 Organic Substances, dust,including fine dust.To be treated as overall dust. The emissions of dust in the exhaust gas are not allowed to exceed the following values:Mass flow:0,20 kg/hr or Mass conc.:20 mg/m³ The mass per unit volume of 0,15 g/m³ in exhaust gas is not allowed to be exceeded also on observance or lower deviation of a mass flow of 0,20 kg/h.For emission sources that exceed the mass flow rate of 0.40 kg/h, the mass concentration in waste gas the mass concentration must not exceed 10 mg/m³.	
Histidine	Chapter 5.2.5 Organic Substances, dust,including fine dust.To be treated as overall dust. The emissions of dust in the exhaust gas are not allowed to exceed the following values:Mass flow:0,20 kg/hr or Mass conc.:20 mg/m³ The mass per unit volume of 0,15 g/m³ in exhaust gas is not allowed to be exceeded also on observance or lower deviation of a mass flow of 0,20 kg/h.For emission sources that exceed the mass flow rate of 0.40 kg/h, the mass concentration in	

	waste gas the mass concentration must not exceed 10 mg/m³.	
L-isoleucine	Chapter 5.2.5 Organic Substances, dust,including fine dust.To be treated as overall dust. The emissions of dust in the exhaust gas are not allowed to exceed the following values:Mass flow:0,20 kg/hr or Mass conc.:20 mg/m³ The mass per unit volume of 0,15 g/m³ in exhaust gas is not allowed to be exceeded also on observance or lower deviation of a mass flow of 0,20 kg/h.For emission sources that exceed the mass flow rate of 0.40 kg/h, the mass concentration in waste gas the mass concentration must not exceed 10 mg/m³.	
L-leucine	Chapter 5.2.5 Organic Substances, dust,including fine dust.To be treated as overall dust. The emissions of dust in the exhaust gas are not allowed to exceed the following values:Mass flow:0,20 kg/hr or Mass conc.:20 mg/m³ The mass per unit volume of 0,15 g/m³ in exhaust gas is not allowed to be exceeded also on observance or lower deviation of a mass flow of 0,20 kg/h.For emission sources that exceed the mass flow rate of 0.40 kg/h, the mass concentration in waste gas the mass concentration must not exceed 10 mg/m³.	
L-lysine	Chapter 5.2.5 Organic Substances, dust,including fine dust.To be treated as overall dust. The emissions of dust in the exhaust gas are not allowed to exceed the following values:Mass flow:0,20 kg/hr or Mass conc.:20 mg/m³ The mass per unit volume of 0,15 g/m³ in exhaust gas is not allowed to be exceeded also on observance or lower deviation of a mass flow of 0,20 kg/h.For emission sources that exceed the mass flow rate of 0.40 kg/h, the mass concentration in waste gas the mass concentration must not exceed 10 mg/m³.	
L-methionine	Chapter 5.2.5 Organic Substances, dust,including fine dust.To be treated as overall dust. The emissions of dust in the exhaust gas are not allowed to exceed the following values:Mass flow:0,20 kg/hr or Mass conc.:20 mg/m³ The mass per unit volume of 0,15 g/m³ in exhaust gas is not allowed to be exceeded also on observance or lower deviation of a mass flow of 0,20 kg/h.For emission sources that	

	exceed the mass flow rate of 0.40 kg/h, the mass concentration in waste gas the mass concentration must not exceed 10 mg/m³.	
L-PHENYLALANINE	Chapter 5.2.5 Organic Substances, dust,including fine dust.To be treated as overall dust. The emissions of dust in the exhaust gas are not allowed to exceed the following values:Mass flow:0,20 kg/hr or Mass conc.:20 mg/m³ The mass per unit volume of 0,15 g/m³ in exhaust gas is not allowed to be exceeded also on observance or lower deviation of a mass flow of 0,20 kg/h.For emission sources that exceed the mass flow rate of 0.40 kg/h, the mass concentration in waste gas the mass concentration must not exceed 10 mg/m³.	
L-proline	Chapter 5.2.5 Organic Substances, dust,including fine dust.To be treated as overall dust. The emissions of dust in the exhaust gas are not allowed to exceed the following values:Mass flow:0,20 kg/hr or Mass conc.:20 mg/m³ The mass per unit volume of 0,15 g/m³ in exhaust gas is not allowed to be exceeded also on observance or lower deviation of a mass flow of 0,20 kg/h.For emission sources that exceed the mass flow rate of 0.40 kg/h, the mass concentration in waste gas the mass concentration must not exceed 10 mg/m³.	
L-serine	Chapter 5.2.5 Organic Substances, dust,including fine dust.To be treated as overall dust. The emissions of dust in the exhaust gas are not allowed to exceed the following values:Mass flow:0,20 kg/hr or Mass conc.:20 mg/m³ The mass per unit volume of 0,15 g/m³ in exhaust gas is not allowed to be exceeded also on observance or lower deviation of a mass flow of 0,20 kg/h.For emission sources that exceed the mass flow rate of 0.40 kg/h, the mass concentration in waste gas the mass concentration must not exceed 10 mg/m³.	
L-threonine	Chapter 5.2.5 Organic Substances, dust,including fine dust.To be treated as overall dust. The emissions of dust in the exhaust gas are not allowed to exceed the following values:Mass flow:0,20 kg/hr or Mass conc.:20 mg/m³ The mass per unit volume of 0,15 g/m³ in exhaust gas is not allowed to be exceeded also on observance or lower	

	deviation of a mass flow of 0,20 kg/h.For emission sources that exceed the mass flow rate of 0.40 kg/h, the mass concentration in waste gas the mass concentration must not exceed 10 mg/m³.	
Tyrosine	Chapter 5.2.5 Organic Substances, dust,including fine dust.To be treated as overall dust. The emissions of dust in the exhaust gas are not allowed to exceed the following values:Mass flow:0,20 kg/hr or Mass conc.:20 mg/m³ The mass per unit volume of 0,15 g/m³ in exhaust gas is not allowed to be exceeded also on observance or lower deviation of a mass flow of 0,20 kg/h.For emission sources that exceed the mass flow rate of 0.40 kg/h, the mass concentration in waste gas the mass concentration must not exceed 10 mg/m³.	
L-valine	Chapter 5.2.5 Organic Substances, dust,including fine dust.To be treated as overall dust. The emissions of dust in the exhaust gas are not allowed to exceed the following values:Mass flow:0,20 kg/hr or Mass conc.:20 mg/m³ The mass per unit volume of 0,15 g/m³ in exhaust gas is not allowed to be exceeded also on observance or lower deviation of a mass flow of 0,20 kg/h.For emission sources that exceed the mass flow rate of 0.40 kg/h, the mass concentration in waste gas the mass concentration must not exceed 10 mg/m³.	

German technical rules for hazardous substances(TRGS)

Component	TRGS	Remark
Water	TRGS 500|TRGS 509|TRGS 510	
L-alanine	TRGS 500|TRGS 509|TRGS 510|TRGS 800	
Arginine	TRGS 500|TRGS 509|TRGS 510|TRGS 800|TRGS 720|TRGS 721|TRGS 722|TRGS 723|TRGS 724	
Asparagine	TRGS 500|TRGS 509|TRGS 510|TRGS 800	
Aspartic acid	TRGS 500|TRGS 509|TRGS 510|TRGS 800	
Cystine	TRGS 500|TRGS 509|TRGS 510|TRGS 800|TRGS 720|TRGS 721|TRGS 722|TRGS 723|TRGS 724	
Glutamic acid	TRGS 500|TRGS 509|TRGS 510|TRGS 800	
Glycine	TRGS 500|TRGS 509|TRGS 510|TRGS 800	

Histidine	TRGS 500|TRGS 509|TRGS 510|TRGS 800	
L-isoleucine	TRGS 500|TRGS 509|TRGS 510|TRGS 800	
L-leucine	TRGS 500|TRGS 509|TRGS 510|TRGS 800	
L-lysine	TRGS 500|TRGS 509|TRGS 510|TRGS 800	
L-methionine	TRGS 500|TRGS 509|TRGS 510|TRGS 800|TRGS 720|TRGS 721|TRGS 722|TRGS 723|TRGS 724	
L-PHENYLALANINE	TRGS 500|TRGS 509|TRGS 510|TRGS 800	
L-proline	TRGS 500|TRGS 509|TRGS 510|TRGS 800	
L-serine	TRGS 500|TRGS 509|TRGS 510|TRGS 800	
L-threonine	TRGS 500|TRGS 509|TRGS 510|TRGS 800	
Tyrosine	TRGS 500|TRGS 509|TRGS 510|TRGS 800|TRGS 720|TRGS 721|TRGS 722|TRGS 723|TRGS 724	
L-valine	TRGS 500|TRGS 509|TRGS 510|TRGS 800	

15.2 Chemical safety assessment

	No Chemical Safety Assessment has been carried out for this substance/mixture by the supplier.

16 Other information

Information on revision

Creation Date	2026/01/20
Revision Date	-
Reason for revision	-

Reference

[1] IPCS: The International Chemical Safety Cards (ICSC), website: http://www.ilo.org/dyn/icsc/showcard.home.
[2] IARC, website: http://www.iarc.fr/.
[3] OECD: The Global Portal to Information on Chemical Substances, website: https://www.echemportal.org/echemportal/.
[4] CAMEO Chemicals, website: http://cameochemicals.noaa.gov/search/simple.
[5] NLM: ChemIDplus, website: http://chem.sis.nlm.nih.gov/chemidplus/chemidlite.jsp.
[6] EPA: Integrated Risk Information System, website: http://cfpub.epa.gov/iris/.
[7] U.S. Department of Transportation: ERG, website: http://www.phmsa.dot.gov/hazmat/library/erg.
[8] Germany GESTIS-database on hazard substance, website: http://gestis-en.itrust.de/.

Abbreviations and acronyms

CAS	Chemical Abstracts Service	UN	The United Nations
PC-STEL	Short term exposure limit	OECD	Organization for Economic Co-operation and Development
PC-TWA	Time Weighted Average	IMDG-CODE	International Maritime Dangerous Goods CODE
MAC	Maximum Allowable Concentration	IARC	International Agency for Research on Cancer
DNEL	Derived No Effect Level	ICAO	International Civil Aviation Organization
PNEC	Predicted No Effect Concentration	IATA	International Air Transportation Association
NOEC	No Observed Effect Concentration	ACGIH	American Conference of Governmental Industrial Hygienists
LC_{50}	Lethal Concentration 50%	NFPA	National Fire Protection Association

LD_{50}	Lethal Dose 50%	NTP	National Toxicology Program
EC_{50}	Effective Concentration 50%	PBT	Persistent, Bioaccumulative, Toxic
EC_X	Effective Concentration X%	vPvB	very Persistent, very Bioaccumulative
P_{OW}	Partition coefficient Octanol: Water	CMR	Carcinogens, mutagens or substances toxic to reproduction
BCF	Bioconcentration factor	RPE	Respiratory Protective Equipment
ED	Endocrine disruptor		

Disclaimer

This Safety Data Sheet (SDS) was prepared according to REACH Regulation The data included was derived from international authoritative database and provided by the enterprise. Other information was based on the present state of our knowledge. We try to ensure the correctness of all information. However, due to the diversity of information sources and the limitations of our knowledge, this document is only for user's reference. Users should make their independent judgment of suitability of this information for their particular purposes. We do not assume responsibility for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product.