Safety Data Sheet

17 Mix amino acids in 0.1 mol/L hydrochloric acid solution

Version：V2.0.0.1
Report No.：BWQ8781-2016-MSDS-EP
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Revision Date：-

***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	17 Mix amino acids in 0.1 mol/L hydrochloric acid solution
Cat No.	BWQ8781-2016
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

Skin corrosion/irritation	Category 1
Serious eye damage/irritation	Category 1

2.2 Label elements

Hazard pictograms	
Signal word	**Danger**

Hazard statements

H314	Causes severe skin burns and eye damage
H318	Causes serious eye damage

Precautionary statements

- Prevention

P260	Do not breathe gas/mist/vapour/spray.
P264	Wash hands and other parts of the body (if related) thoroughly after handling.
P280	Wear protective gloves/protective clothing/eye protection/face protection.

- Response

P310	Immediately call a POISON CENTER/doctor.
P321	Specific treatment (see related instructions on the label).
P363	Wash contaminated clothing before reuse.
P304+P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P301+P330+P331	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303+P361+P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse affected areas with water [or shower].
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

- Storage

P405	Store locked up.

- Disposal

P501	Dispose of contents/container in accordance with local/regional/national/ international regulations.

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
Hydrogen chloride	Not PBT/vPvB
D-aspartic acid	Insufficient information, temporarily unable to evaluate
L-threonine	Not PBT/vPvB
L-serine	Not PBT/vPvB
Glutamic acid	Insufficient information, temporarily unable to evaluate
Glycine	Not PBT/vPvB
L-alanine	Not PBT/vPvB

Cystine	Not PBT/vPvB
L-valine	Not PBT/vPvB
DL-methionine	Insufficient information, temporarily unable to evaluate
L-isoleucine	Not PBT/vPvB
L-leucine	Not PBT/vPvB
Tyrosine	Insufficient information, temporarily unable to evaluate
3-phenyl-L-alanine	Not PBT/vPvB
L-lysine hydrochloride	Insufficient information, temporarily unable to evaluate
Histidine	Not PBT/vPvB
Arginine	Not PBT/vPvB
L-proline	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
Hydrogen chloride	Insufficient information, temporarily unable to evaluate
D-aspartic acid	Insufficient information, temporarily unable to evaluate
L-threonine	Insufficient information, temporarily unable to evaluate
L-serine	Insufficient information, temporarily unable to evaluate
Glutamic acid	Insufficient information, temporarily unable to evaluate
Glycine	Insufficient information, temporarily unable to evaluate
L-alanine	Insufficient information, temporarily unable to evaluate
Cystine	Insufficient information, temporarily unable to evaluate
L-valine	Insufficient information, temporarily unable to evaluate
DL-methionine	Insufficient information, temporarily unable to evaluate
L-isoleucine	Insufficient information, temporarily unable to evaluate
L-leucine	Insufficient information, temporarily unable to evaluate
Tyrosine	Insufficient information, temporarily unable to evaluate
3-phenyl-L-alanine	Insufficient information, temporarily unable to evaluate
L-lysine hydrochloride	Insufficient information, temporarily unable to evaluate
Histidine	Insufficient information, temporarily unable to evaluate
Arginine	Insufficient information, temporarily unable to evaluate
L-proline	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.：-	99.388	Not Classified	-
Hydrogen chloride CAS：7647-01-0 EC：231-595-7 Index No.：017-002-00-2	0.365	Skin corrosion/irritation, Category 1B, H314; Specific target organ toxicity - single exposure; respiratory tract irritation, Category 3, H335	H314B:C≥25%|H315:10%≤C<25%|H319:10%≤C<25%|H335:C≥10%
D-aspartic acid CAS：1783-96-6 EC：217-234-6 Index No.：-	0.014	Not Classified	-
L-threonine CAS：72-19-5 EC：200-774-1 Index No.：-	0.012	Not Classified	-
L-serine CAS：56-45-1 EC：200-274-3 Index No.：-	0.011	Not Classified	-
Glutamic acid CAS：56-86-0 EC：200-293-7 Index No.：-	0.015	Not Classified	-
Glycine CAS：56-40-6 EC：200-272-2 Index No.：-	0.007	Not Classified	-
L-alanine CAS：56-41-7 EC：200-273-8 Index No.：-	0.009	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	-
Cystine CAS：56-89-3 EC：200-296-3 Index No.：-	0.024	Not Classified	-
L-valine CAS：72-18-4 EC：200-773-6 Index No.：-	0.012	Not Classified	-
DL-methionine CAS：59-51-8 EC：200-432-1 Index No.：-	0.015	Not Classified	-
L-isoleucine CAS：73-32-5 EC：200-798-2 Index No.：-	0.013	Not Classified	-
L-leucine CAS：61-90-5 EC：200-522-0	0.013	Not Classified	-

Index No. : -			
Tyrosine CAS：60-18-4 EC：200-460-4 Index No. : -	0.018	Not Classified	-
3-phenyl-L-alanine CAS：63-91-2 EC：200-568-1 Index No. : -	0.016	Not Classified	-
L-lysine hydrochloride CAS：10098-89-2 EC：233-234-9 Index No. : -	0.018	No information available	-
Histidine CAS：71-00-1 EC：200-745-3 Index No. : -	0.016	Not Classified	-
Arginine CAS：74-79-3 EC：200-811-1 Index No. : -	0.017	Not Classified	-
L-proline CAS：147-85-3 EC：205-702-2 Index No. : -	0.011	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	Small fire: dry chemical, CO_2 or water spray; Large fire: dry chemical, CO_2, alcohol-resistant foam or water spray; Fire involving tanks, rail tank cars or highway tanks: Fight fire from maximum distance or use unmanned master stream devices or monitor nozzles. Cool containers with flooding quantities of water until well after fire is out. Do not get water inside containers.
Unsuitable extinguishing media	No information available.

5.2 Specific hazards arising from the substance or mixture

1	Fire may produce irritating, poisonous or corrosive gases.
2	Development of hazardous combustion gases or vapor possible in the event of fire.
3	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	Fully encapsulating, vapor protective clothing should be worn for spills and leaks with no fire.
2	Do not touch or walk through spilled material.
3	Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.
4	Use personal protective equipment,do not breathe gas/mist/vapour/spray.
5	Ensure adequate ventilation. Remove all sources of ignition. Take precautionary measures against static discharges.
6	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	Do not touch or cross spills.
2	It is recommended that emergency personnel wear a self-contained breathing apparatus with positive pressure and wear anti-corrosion clothing.
3	Transfer to a tank truck or special collector with a corrosion-resistant pump.
4	Do not touch broken containers and spills before putting on appropriate protective clothing.
5	Cut off the source of the leak as much as possible.
6	Keep leaks in a ventilated place.
7	Absorb spilled material in dry sand or inert absorbent. In case of large amount of spillage, contain a spill by bunding.
8	Remove all sources of ignition. Use spark-proof tools and explosion-proof equipment.
9	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

Component	Country/Region	Limit value - Eight hours		Limit value - Short term	
		ppm	mg/m³	ppm	mg/m³
Hydrogen chloride	Japan - JSOH(2024–2025)	-	-	-	-
	Permissible exposure standards for workers in the workplace	-	-	-	-
	European Union	5	8	10	15
	France	-	-	5	7.6
	Germany (AGS)	2	3	4	6

	Germany (DFG)	2	3	4	6

◆ 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
Hydrogen chloride	Inhalation	No data available	No data available	8 mg/m3	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
D-aspartic 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
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
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
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
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
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

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
DL-methionine	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-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
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
3-phenyl-L-alanine	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-lysine hydrochloride	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
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
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

◆ Predicted No Effect Concentration (PNEC)

Component	A	B	C	D	E	F	G	H
Hydrogen chloride	No hazard identified	No hazard identified	No hazard identified	No hazard identified	No hazard identified	No hazard identified	No data available	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-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
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
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
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
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
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 organism

								s) via the food chain
3-phenyl-L-alanine	No hazard identified	No hazard identified	No hazard identified	No data available	No data available	No hazard identified	No hazard identified	No potential to cause toxic effects if accumulated (in higher organisms) via the food chain
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
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
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

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 anti-corrosion goggles.
Hand protection	Must wear acid and alkali resistant chemical protective gloves.
Respiratory protection	Must wear appropriate personal respiratory protective equipment.
Skin and body protection	Must wear acid and alkali resistant chemical protective clothing.

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 or clear yellow liquid
Colour	clear or clear yellow liquid
Odor	No information available
Odor threshold	No information available
pH	1.2 (Hydrogen chloride)
Melting point/freezing point(°C)	-30 (37% solution,Hydrogen chloride)
Initial boiling point and boiling range(°C)	-85.1 (Hydrogen chloride)
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	190hPa (20°C , 37%,Hydrogen chloride)
Vapor density(Air = 1)	1.3 (Hydrogen chloride)
Relative density(Water=1)	1.19 (37% Solution,Hydrogen chloride)
Solubility	500g/L (20 °C,Hydrogen chloride)
n-octanol/water partition coefficient	0.25 (Hydrogen chloride)
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	No information available

physical hazard classes	

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. In contact with magnesium, sodium, potassium, copper and other metals or metal acetylense may cause a fire or explosion.
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. Magnesium, sodium, potassium, copper, oxidants, acetylene metal compounds, alcohols, alkanes, hydrogen and water.
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

17 Mix amino acids in 0.1 mol/L hydrochloric acid solution	
Skin corrosion/irritation	Causes severe skin burns and eye damage(Category 1)
Serious eye damage/irritation	Causes serious eye damage(Category 1)
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
Histidine	> 15000mg/kg(Rat)	No information available	No information available
Hydrogen chloride	900mg/kg(Rabbit)	No information available	1405ppmV(Rat)
Glycine	7930mg/kg(Rat)	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
Hydrogen chloride	Category 3	Not Listed
D-aspartic acid	Not Listed	Not Listed
L-threonine	Not Listed	Not Listed
L-serine	Not Listed	Not Listed
Glutamic acid	Not Listed	Not Listed
Glycine	Not Listed	Not Listed
L-alanine	Not Listed	Not Listed
Cystine	Not Listed	Not Listed
L-valine	Not Listed	Not Listed
DL-methionine	Not Listed	Not Listed
L-isoleucine	Not Listed	Not Listed
L-leucine	Not Listed	Not Listed
Tyrosine	Not Listed	Not Listed
3-phenyl-L-alanine	Not Listed	Not Listed
L-lysine hydrochloride	Not Listed	Not Listed
Histidine	Not Listed	Not Listed
Arginine	Not Listed	Not Listed
L-proline	Not Listed	Not Listed

11.2 Information on other hazards

11.2.1 Endocrine disrupting properties

Component	Endocrine disrupting properties
Water	No information available
Hydrogen chloride	No information available
D-aspartic acid	No information available
L-threonine	No information available
L-serine	No information available
Glutamic acid	No information available
Glycine	No information available
L-alanine	No information available
Cystine	No information available
L-valine	No information available
DL-methionine	No information available
L-isoleucine	No information available
L-leucine	No information available
Tyrosine	No information available

3-phenyl-L-alanine	No information available
L-lysine hydrochloride	No information available
Histidine	No information available
Arginine	No information available
L-proline	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)
Arginine	LC_{50}：2800mg/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)
L-isoleucine	LC_{50}：> 11200mg/L (96h)(Fish)	No information available	No information available
Hydrogen chloride	LC_{50}：20.5mg/L (96h)(Fish)	No information available	No information available
L-proline	LC_{50}：10500mg/L (96h)(Fish)	No information available	No information available
Glycine	LC_{50}：1000mg/L (96h)(Fish)	No information available	No information available
Tyrosine	No information available	EC_{50}：> 100mg/L (48h)(Crustaceans)	ErC_{50}：> 63.2mg/L (72h)(Algae)
DL-methionine	LC_{50}：>100mg/L (96h)(Fish)	EC_{50}：>1000mg/L (48h)(Crustaceans)	ErC_{50}：>1000mg/L (72h)(Algae)
L-alanine	LC_{50}：26300mg/L (96h)(Fish)	No information available	No information available

Chronic aquatic toxicity

Component	Fish	Crustaceans	Algae or other aquatic plants
DL-methionine	No information available	NOEC：32mg/L(Crustaceans)	NOEC：1.0mg/L(Algae)

12.2 Persistence and degradability

Component	Persistence (water/soil)	Persistence (air)
L-threonine	Low	Low
L-serine	Low	Low

Glutamic acid	Low	Low
Glycine	Low	Low
L-alanine	Low	Low
L-valine	High	High
DL-methionine	Low	Low
L-isoleucine	High	High
L-leucine	High	High
Tyrosine	High	High
3-phenyl-L-alanine	High	High
Histidine	High	High
Arginine	Low	Low
L-proline	Low	Low

12.3 Bioaccumulative potential

Component	Bioaccumulative potential	Comments
L-threonine	Low	Log Kow=-2.94
L-serine	Low	Log Kow=-3.07
Glutamic acid	Low	Log Kow=-3.69
Glycine	Low	Log Kow=-3.21
L-alanine	Low	Log Kow=-2.9904
L-valine	Low	Log Kow=-2.26
DL-methionine	Low	Log Kow=-1.87
L-isoleucine	Low	Log Kow=-1.7
L-leucine	Low	Log Kow=-1.52
Tyrosine	Low	Log Kow=-1.7628
3-phenyl-L-alanine	Low	Log Kow=-1.2826
Histidine	Low	Log Kow=-3.32
Arginine	Low	Log Kow=-4.2
L-proline	Low	Log Kow=-2.54

12.4 Mobility in soil

Component	log Koc	Remark
L-threonine	0.000	
L-serine	-1.976	
Glutamic acid	-1.92082	
Glycine	0.000	
L-alanine	-1.44	20 ℃

L-valine	-1.11	20 ℃
DL-methionine	0.971	
L-isoleucine	-0.817	log Kow method
L-leucine	-0.707	log Kow method
Tyrosine	1.987	
3-phenyl-L-alanine	1.778	
Histidine	-1.304	log Kow method
Arginine	1.319	
L-proline	-1.29	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
Hydrogen chloride	Not PBT/vPvB
D-aspartic acid	Insufficient information, temporarily unable to evaluate
L-threonine	Not PBT/vPvB
L-serine	Not PBT/vPvB
Glutamic acid	Insufficient information, temporarily unable to evaluate
Glycine	Not PBT/vPvB
L-alanine	Not PBT/vPvB
Cystine	Not PBT/vPvB
L-valine	Not PBT/vPvB
DL-methionine	Insufficient information, temporarily unable to evaluate
L-isoleucine	Not PBT/vPvB
L-leucine	Not PBT/vPvB
Tyrosine	Insufficient information, temporarily unable to evaluate
3-phenyl-L-alanine	Not PBT/vPvB
L-lysine hydrochloride	Insufficient information, temporarily unable to evaluate
Histidine	Not PBT/vPvB
Arginine	Not PBT/vPvB
L-proline	Not PBT/vPvB

12.6 Endocrine disrupting properties

Component	Endocrine disrupting properties
Water	No information available
Hydrogen chloride	No information available
D-aspartic acid	No information available

L-threonine	No information available
L-serine	No information available
Glutamic acid	No information available
Glycine	No information available
L-alanine	No information available
Cystine	No information available
L-valine	No information available
DL-methionine	No information available
L-isoleucine	No information available
L-leucine	No information available
Tyrosine	No information available
3-phenyl-L-alanine	No information available
L-lysine hydrochloride	No information available
Histidine	No information available
Arginine	No information available
L-proline	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	

IMDG-CODE

14.1 UN number	3264
14.2 UN proper shipping name	CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.
14.3 Transport hazard class	8
14.4 Packing group	Ⅲ
14.5 Environmental hazards (Yes or no)	No

IATA-DGR

14.1 UN number	3264
14.2 UN proper shipping name	CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.
14.3 Transport hazard class	8
14.4 Packing group	Ⅲ
14.5 Environmental hazards (Yes or no)	No

UN-ADR

14.1 UN number	3264
14.2 UN proper shipping name	CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.
14.3 Transport hazard class	8
14.4 Packing group	Ⅲ
14.5 Environmental hazards (Yes or no)	No

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	√	√	√	√	√	√	√	√	√	√	√	√	√
Hydrogen chloride	√	√	√	√	√	√	√	√	√	√	√	√	√
D-aspartic acid	√	√	×	×	√	×	×	×	√	×	×	√	√
L-threonine	√	√	√	√	√	√	√	√	√	√	√	√	√
L-serine	√	√	√	√	√	√	√	√	√	√	√	√	√
Glutamic acid	√	√	√	√	√	√	√	√	√	√	√	√	√
Glycine	√	√	√	√	√	√	√	√	√	√	√	√	√

L-alanine	√	√	√	√	√	√	√	√	√	√	√	√	√
Cystine	√	√	√	√	√	√	√	√	√	×	×	√	√
L-valine	√	√	√	√	√	√	√	√	√	√	√	√	√
DL-methionine	√	√	√	√	√	√	√	√	√	×	√	√	√
L-isoleucine	√	√	√	√	√	√	√	√	√	√	√	√	√
L-leucine	√	√	√	√	√	√	×	√	√	×	√	√	√
Tyrosine	√	√	√	√	√	√	√	√	√	×	×	√	√
3-phenyl-L-alanine	√	√	√	√	√	√	√	√	√	√	×	√	√
L-lysine hydrochloride	√	√	√	×	×	√	×	√	×	×	×	√	√
Histidine	√	√	√	√	√	√	√	√	√	√	√	√	√
Arginine	√	√	√	√	√	√	√	√	√	×	√	√	√
L-proline	√	√	√	√	√	√	√	√	√	×	×	√	√

【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	×	×	×
Hydrogen chloride	×	×	×
D-aspartic acid	×	×	×
L-threonine	×	×	×
L-serine	×	×	×
Glutamic acid	×	×	×
Glycine	×	×	×
L-alanine	×	×	×
Cystine	×	×	×
L-valine	×	×	×
DL-methionine	×	×	×
L-isoleucine	×	×	×
L-leucine	×	×	×
Tyrosine	×	×	×

3-phenyl-L-alanine	×	×	×
L-lysine hydrochloride	×	×	×
Histidine	×	×	×
Arginine	×	×	×
L-proline	×	×	×

【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	×	×	×	√	×	×	×	×	×
Hydrogen chloride	×	×	×	√	√	×	×	×	×
D-aspartic acid	×	×	×	√	×	×	×	×	×
L-threonine	×	×	×	√	√	×	×	×	×
L-serine	×	×	×	√	√	×	×	×	×
Glutamic acid	×	×	×	√	√	×	×	×	×
Glycine	×	×	×	√	√	×	×	×	×
L-alanine	×	×	×	√	√	×	×	×	×
Cystine	×	×	×	√	√	×	×	×	×
L-valine	×	×	×	√	√	×	×	×	×
DL-methionine	×	×	×	√	×	×	×	×	×
L-isoleucine	×	×	×	√	√	×	×	×	×
L-leucine	×	×	×	√	√	×	×	×	×
Tyrosine	×	×	×	√	√	×	×	×	×
3-phenyl-L-alanine	×	×	×	√	√	×	×	×	×
L-lysine hydrochloride	×	×	×	√	×	×	×	×	×
Histidine	×	×	×	√	√	×	×	×	×
Arginine	×	×	×	√	√	×	×	×	×
L-proline	×	×	×	√	√	×	×	×	×

[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
Hydrogen chloride	WGK 1	The regular and professional use of this substance for drinking water treatment, surface water remediation or waste water treatment is not restricted by this classification.
D-aspartic acid	WGK 1	
L-threonine	WGK 1	
L-serine	WGK 1	
Glutamic acid	WGK 1	
Glycine	WGK 1	
L-alanine	WGK 1	
Cystine	WGK 1	
L-valine	WGK 1	
DL-methionine	WGK 1	
L-isoleucine	WGK 1	
L-leucine	WGK 1	
Tyrosine	WGK 1	
3-phenyl-L-alanine	WGK 1	
Histidine	WGK 1	
Arginine	WGK 1	
L-proline	WGK 1	

【WGK 1】 slightlyhazardous to water
【WGK 2】 obviouslyhazardous 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
Hydrogen chloride	Chapter 5.2.4 Gaseous inorganic substances. Class III. Following values are not allowed to be exceeded in the. exhaust gasMass flow:0,15 kg/hr or Mass conc.:30 mg/m³. Specified as hydrogen chlorid.	
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.	
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.	
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.	
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.	
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.	
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.	
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.	
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.	
3-phenyl-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.	
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.	
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.	
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.	

German technical rules for hazardous substances(TRGS)

Component	TRGS	Remark
Water	TRGS 500|TRGS 509|TRGS 510	
Hydrogen chloride	TRGS 201|TRGS 400|TRGS 555|TRGS 600|TRGS 402|TRGS 401|TRGS 407|TRGS 745/TRBS 3145|TRGS 746/TRBS 3146|TRGS 510|TRGS 500	
L-threonine	TRGS 500|TRGS 509|TRGS 510|TRGS 800	
L-serine	TRGS 500|TRGS 509|TRGS 510|TRGS 800	
Glutamic acid	TRGS 500|TRGS 509|TRGS 510|TRGS 800	
Glycine	TRGS 500|TRGS 509|TRGS 510|TRGS 800	
L-alanine	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	
L-valine	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	
Tyrosine	TRGS 500|TRGS 509|TRGS 510|TRGS 800|TRGS 720|TRGS 721|TRGS 722|TRGS 723|TRGS 724	
3-phenyl-L-alanine	TRGS 500|TRGS 509|TRGS 510|TRGS 800	
Histidine	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	
L-proline	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	2026/01/07
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.