

SAFETY DATA SHEET



Amino Acid Supplement Kit - For R&D Only, Part Number 5062-2478

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

1.1 Product identifier

Product name : Amino Acid Supplement Kit - For R&D Only, Part Number 5062-2478
Part No. (Kit) : 5062-2478
Part No. : Sarcosine Not available.
L-Tryptophan Not available.
L-Norvaline Not available.
L-Glutamine Not available.
L-Asparagine Not available.
L-4-Hydroxyproline Not available.

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

Identified uses	
Analytical chemistry.	
Analytical Standards	
Sarcosine	1 g
L-Tryptophan	1 g
L-Norvaline	1 g
L-Glutamine	1 g
L-Asparagine	1 g
L-4-Hydroxyproline	1 g

1.3 Details of the supplier of the safety data sheet

Agilent Technologies Manufacturing GmbH & Co. KG
Hewlett-Packard-Str. 8
76337 Waldbronn
Germany
0800 603 1000

e-mail address of person responsible for this SDS : pdl-msds_author@agilent.com

1.4 Emergency telephone number

Emergency telephone number (with hours of operation) : CHEMTREC®: +(44)-870-8200418

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Product definition : Sarcosine Mono-constituent substance
L-Tryptophan Mono-constituent substance
L-Norvaline Mono-constituent substance
L-Glutamine Mono-constituent substance
L-Asparagine Mono-constituent substance
L-4-Hydroxyproline Mono-constituent substance

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

Not classified.

See Section 16 for the full text of the H statements declared above.

See Section 11 for more detailed information on health effects and symptoms.

Date of issue/Date of revision : 17/05/2017

SECTION 2: Hazards identification

2.2 Label elements

Signal word	: Sarcosine L-Tryptophan L-Norvaline L-Glutamine L-Asparagine L-4-Hydroxyproline	No signal word. No signal word. No signal word. No signal word. No signal word. No signal word.
Hazard statements	: Sarcosine L-Tryptophan L-Norvaline L-Glutamine L-Asparagine L-4-Hydroxyproline	No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards.
<u>Precautionary statements</u>		
Prevention	: Sarcosine L-Tryptophan L-Norvaline L-Glutamine L-Asparagine L-4-Hydroxyproline	Not applicable. Not applicable. Not applicable. Not applicable. Not applicable. Not applicable.
Response	: Sarcosine L-Tryptophan L-Norvaline L-Glutamine L-Asparagine L-4-Hydroxyproline	Not applicable. Not applicable. Not applicable. Not applicable. Not applicable. Not applicable.
Storage	: Sarcosine L-Tryptophan L-Norvaline L-Glutamine L-Asparagine L-4-Hydroxyproline	Not applicable. Not applicable. Not applicable. Not applicable. Not applicable. Not applicable.
Disposal	: Sarcosine L-Tryptophan L-Norvaline L-Glutamine L-Asparagine L-4-Hydroxyproline	Not applicable. Not applicable. Not applicable. Not applicable. Not applicable. Not applicable.
Supplemental label elements	: Sarcosine L-Tryptophan L-Norvaline L-Glutamine L-Asparagine L-4-Hydroxyproline	Not applicable. Not applicable. Not applicable. Not applicable. Not applicable. Not applicable.
Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles	: Sarcosine L-Tryptophan L-Norvaline L-Glutamine L-Asparagine L-4-Hydroxyproline	Not applicable. Not applicable. Not applicable. Not applicable. Not applicable. Not applicable.
<u>Special packaging requirements</u>		
Tactile warning of danger	: Sarcosine L-Tryptophan L-Norvaline L-Glutamine L-Asparagine L-4-Hydroxyproline	Not applicable. Not applicable. Not applicable. Not applicable. Not applicable. Not applicable.

Amino Acid Supplement Kit - For R&D Only, Part Number 5062-2478

SECTION 2: Hazards identification

2.3 Other hazards

Other hazards which do not result in classification	: <input checked="" type="checkbox"/> Sarcosine L-Tryptophan L-Norvaline L-Glutamine L-Asparagine L-4-Hydroxyproline	May form explosible dust-air mixture if dispersed. May form explosible dust-air mixture if dispersed. May form explosible dust-air mixture if dispersed. May form explosible dust-air mixture if dispersed. May form explosible dust-air mixture if dispersed. May form explosible dust-air mixture if dispersed.
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SECTION 3: Composition/information on ingredients

3.1 Substances	: Sarcosine L-Tryptophan L-Norvaline L-Glutamine L-Asparagine L-4-Hydroxyproline	Mono-constituent substance Mono-constituent substance Mono-constituent substance Mono-constituent substance Mono-constituent substance Mono-constituent substance
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Product/ingredient name	Identifiers	%	Regulation (EC) No. 1272/2008 [CLP]	Type
<input checked="" type="checkbox"/> Sarcosine Sarcosine	EC: 203-538-6 CAS: 107-97-1	100	Not classified.	[A]
L-Tryptophan L-Tryptophan	EC: 200-795-6 CAS: 73-22-3	100	Not classified.	[A]
L-Norvaline Norvaline	EC: 229-543-3 CAS: 6600-40-4	100	Not classified.	[A]
L-Glutamine Levoglutamide	EC: 200-292-1 CAS: 56-85-9	100	Not classified.	[A]
L-Asparagine Asparagine	EC: 200-735-9 CAS: 70-47-3	100	Not classified.	[A]
L-4-Hydroxyproline L-4-Hydroxyproline	EC: 200-091-9 CAS: 51-35-4	100	Not classified.	[A]

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Type

- [1] Substance classified with a health or environmental hazard
- [2] Substance with a workplace exposure limit
- [3] Substance meets the criteria for PBT according to Regulation (EC) No. 1907/2006, Annex XIII
- [4] Substance meets the criteria for vPvB according to Regulation (EC) No. 1907/2006, Annex XIII
- [5] Substance of equivalent concern
- [6] Additional disclosure due to company policy
- [A] Constituent
- [B] Impurity
- [C] Stabilising additive

SECTION 4: First aid measures

4.1 Description of first aid measures

Eye contact	: Sarcosine	Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Get medical attention if irritation occurs.
	L-Tryptophan	Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Get medical attention if irritation occurs.
	L-Norvaline	Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Get medical attention if irritation occurs.
	L-Glutamine	Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Get medical attention if irritation occurs.
	L-Asparagine	Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Get medical attention if irritation occurs.
	L-4-Hydroxyproline	Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Get medical attention if irritation occurs.
Inhalation	: Sarcosine	Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.
	L-Tryptophan	Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.
	L-Norvaline	Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.
	L-Glutamine	Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.
	L-Asparagine	Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.
	L-4-Hydroxyproline	Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

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Skin contact	: Sarcosine	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.
	L-Tryptophan	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.
	L-Norvaline	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.
	L-Glutamine	Wash contaminated skin with soap and water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.
	L-Asparagine	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.
	L-4-Hydroxyproline	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.
Ingestion	: Sarcosine	Wash out mouth with water. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur.
	L-Tryptophan	Wash out mouth with water. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur.
	L-Norvaline	Wash out mouth with water. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur.
	L-Glutamine	Wash out mouth with water. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur.
	L-Asparagine	Wash out mouth with water. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur.
	L-4-Hydroxyproline	Wash out mouth with water. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur.
Protection of first-aiders	: Sarcosine	No action shall be taken involving any personal risk or without suitable training.
	L-Tryptophan	No action shall be taken involving any personal risk or without suitable training.
	L-Norvaline	No action shall be taken involving any personal risk or without suitable training.
	L-Glutamine	No action shall be taken involving any personal risk or

SECTION 4: First aid measures

L-Asparagine	without suitable training. No action shall be taken involving any personal risk or without suitable training.
L-4-Hydroxyproline	No action shall be taken involving any personal risk or without suitable training.

4.2 Most important symptoms and effects, both acute and delayed

Potential acute health effects

Eye contact	: Sarcosine	Exposure to airborne concentrations above statutory or recommended exposure limits may cause irritation of the eyes.
	L-Tryptophan	Exposure to airborne concentrations above statutory or recommended exposure limits may cause irritation of the eyes.
	L-Norvaline	Exposure to airborne concentrations above statutory or recommended exposure limits may cause irritation of the eyes.
	L-Glutamine	Exposure to airborne concentrations above statutory or recommended exposure limits may cause irritation of the eyes.
	L-Asparagine	Exposure to airborne concentrations above statutory or recommended exposure limits may cause irritation of the eyes.
	L-4-Hydroxyproline	Exposure to airborne concentrations above statutory or recommended exposure limits may cause irritation of the eyes.
Inhalation	: Sarcosine	Exposure to airborne concentrations above statutory or recommended exposure limits may cause irritation of the nose, throat and lungs.
	L-Tryptophan	Exposure to airborne concentrations above statutory or recommended exposure limits may cause irritation of the nose, throat and lungs.
	L-Norvaline	Exposure to airborne concentrations above statutory or recommended exposure limits may cause irritation of the nose, throat and lungs.
	L-Glutamine	Exposure to airborne concentrations above statutory or recommended exposure limits may cause irritation of the nose, throat and lungs.
	L-Asparagine	Exposure to airborne concentrations above statutory or recommended exposure limits may cause irritation of the nose, throat and lungs.
	L-4-Hydroxyproline	Exposure to airborne concentrations above statutory or recommended exposure limits may cause irritation of the nose, throat and lungs.
Skin contact	: Sarcosine	No known significant effects or critical hazards.
	L-Tryptophan	No known significant effects or critical hazards.
	L-Norvaline	No known significant effects or critical hazards.
	L-Glutamine	No known significant effects or critical hazards.
	L-Asparagine	No known significant effects or critical hazards.
	L-4-Hydroxyproline	No known significant effects or critical hazards.
Ingestion	: Sarcosine	No known significant effects or critical hazards.
	L-Tryptophan	No known significant effects or critical hazards.
	L-Norvaline	No known significant effects or critical hazards.
	L-Glutamine	No known significant effects or critical hazards.
	L-Asparagine	No known significant effects or critical hazards.
	L-4-Hydroxyproline	No known significant effects or critical hazards.

Over-exposure signs/symptoms

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Eye contact	: Sarcosine	Adverse symptoms may include the following: irritation redness
	L-Tryptophan	Adverse symptoms may include the following: irritation redness
	L-Norvaline	Adverse symptoms may include the following: irritation redness
	L-Glutamine	Adverse symptoms may include the following: irritation redness
	L-Asparagine	Adverse symptoms may include the following: irritation redness
	L-4-Hydroxyproline	Adverse symptoms may include the following: irritation redness
Inhalation	: Sarcosine	Adverse symptoms may include the following: respiratory tract irritation coughing
	L-Tryptophan	Adverse symptoms may include the following: respiratory tract irritation coughing
	L-Norvaline	Adverse symptoms may include the following: respiratory tract irritation coughing
	L-Glutamine	Adverse symptoms may include the following: respiratory tract irritation coughing
	L-Asparagine	Adverse symptoms may include the following: respiratory tract irritation coughing
	L-4-Hydroxyproline	Adverse symptoms may include the following: respiratory tract irritation coughing
Skin contact	: Sarcosine	No specific data.
	L-Tryptophan	No specific data.
	L-Norvaline	No specific data.
	L-Glutamine	No specific data.
	L-Asparagine	No specific data.
	L-4-Hydroxyproline	No specific data.
Ingestion	: Sarcosine	No specific data.
	L-Tryptophan	No specific data.
	L-Norvaline	No specific data.
	L-Glutamine	No specific data.
	L-Asparagine	No specific data.
	L-4-Hydroxyproline	No specific data.

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician	: Sarcosine	In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.
	L-Tryptophan	In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.
	L-Norvaline	In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.
	L-Glutamine	In case of inhalation of decomposition products in a fire,

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	L-Asparagine	symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.
	L-4-Hydroxyproline	In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.
Specific treatments	: Sarcosine	No specific treatment.
	L-Tryptophan	No specific treatment.
	L-Norvaline	No specific treatment.
	L-Glutamine	No specific treatment.
	L-Asparagine	No specific treatment.
	L-4-Hydroxyproline	No specific treatment.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media	: Sarcosine	Use dry chemical powder.
	L-Tryptophan	Use dry chemical powder.
	L-Norvaline	Use dry chemical powder.
	L-Glutamine	Use dry chemical powder.
	L-Asparagine	Use dry chemical powder.
	L-4-Hydroxyproline	Use dry chemical powder.
Unsuitable extinguishing media	: Sarcosine	Avoid high pressure media which could cause the formation of a potentially explosible dust-air mixture.
	L-Tryptophan	Avoid high pressure media which could cause the formation of a potentially explosible dust-air mixture.
	L-Norvaline	Avoid high pressure media which could cause the formation of a potentially explosible dust-air mixture.
	L-Glutamine	Avoid high pressure media which could cause the formation of a potentially explosible dust-air mixture.
	L-Asparagine	Avoid high pressure media which could cause the formation of a potentially explosible dust-air mixture.
	L-4-Hydroxyproline	Avoid high pressure media which could cause the formation of a potentially explosible dust-air mixture.

5.2 Special hazards arising from the substance or mixture

Hazards from the substance or mixture	: Sarcosine	May form explosible dust-air mixture if dispersed.
	L-Tryptophan	May form explosible dust-air mixture if dispersed.
	L-Norvaline	May form explosible dust-air mixture if dispersed.
	L-Glutamine	May form explosible dust-air mixture if dispersed.
	L-Asparagine	May form explosible dust-air mixture if dispersed.
	L-4-Hydroxyproline	May form explosible dust-air mixture if dispersed.
Hazardous combustion products	: Sarcosine	Decomposition products may include the following materials: carbon dioxide carbon monoxide nitrogen oxides
	L-Tryptophan	Decomposition products may include the following materials: carbon dioxide carbon monoxide nitrogen oxides
	L-Norvaline	Decomposition products may include the following materials: carbon dioxide carbon monoxide nitrogen oxides
	L-Glutamine	Decomposition products may include the following materials: carbon dioxide carbon monoxide nitrogen oxides
	L-Asparagine	Decomposition products may include the following materials:

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	carbon dioxide carbon monoxide nitrogen oxides
L-4-Hydroxyproline	Decomposition products may include the following materials: carbon dioxide carbon monoxide nitrogen oxides

5.3 Advice for firefighters

Special precautions for fire-fighters

: Sarcosine	Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.
L-Tryptophan	Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.
L-Norvaline	Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.
L-Glutamine	Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.
L-Asparagine	Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.
L-4-Hydroxyproline	Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.

Special protective equipment for fire-fighters

: Sarcosine	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.
L-Tryptophan	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.
L-Norvaline	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.
L-Glutamine	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Clothing for fire-fighters (including helmets, protective boots and gloves)

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L-Asparagine	conforming to European standard EN 469 will provide a basic level of protection for chemical incidents. Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.
L-4-Hydroxyproline	conforming to European standard EN 469 will provide a basic level of protection for chemical incidents. Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel	: Sarcosine	No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing dust. Put on appropriate personal protective equipment.
	L-Tryptophan	No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing dust. Put on appropriate personal protective equipment.
	L-Norvaline	No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing dust. Put on appropriate personal protective equipment.
	L-Glutamine	No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing dust. Put on appropriate personal protective equipment.
	L-Asparagine	No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing dust. Put on appropriate personal protective equipment.
	L-4-Hydroxyproline	No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing dust. Put on appropriate personal protective equipment.

SECTION 6: Accidental release measures

For emergency responders

: Sarcosine	If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
L-Tryptophan	If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
L-Norvaline	If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
L-Glutamine	If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
L-Asparagine	If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
L-4-Hydroxyproline	If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

6.2 Environmental precautions

: Sarcosine	Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
L-Tryptophan	Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
L-Norvaline	Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
L-Glutamine	Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
L-Asparagine	Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
L-4-Hydroxyproline	Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

6.3 Methods and material for containment and cleaning up

Methods for cleaning up

: Sarcosine	Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Vacuum or sweep up material and place in a designated, labelled waste container. Dispose of via a licensed waste disposal contractor.
L-Tryptophan	Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Vacuum or sweep up material and place in a designated, labelled waste container. Dispose of via a licensed waste disposal contractor.
L-Norvaline	Move containers from spill area. Use spark-proof tools and

SECTION 6: Accidental release measures

	explosion-proof equipment. Vacuum or sweep up material and place in a designated, labelled waste container. Dispose of via a licensed waste disposal contractor.
L-Glutamine	Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Vacuum or sweep up material and place in a designated, labelled waste container. Dispose of via a licensed waste disposal contractor.
L-Asparagine	Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Vacuum or sweep up material and place in a designated, labelled waste container. Dispose of via a licensed waste disposal contractor.
L-4-Hydroxyproline	Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Vacuum or sweep up material and place in a designated, labelled waste container. Dispose of via a licensed waste disposal contractor.

6.4 Reference to other sections : See Section 1 for emergency contact information.
See Section 8 for information on appropriate personal protective equipment.
See Section 13 for additional waste treatment information.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Protective measures	: Sarcosine	Put on appropriate personal protective equipment (see Section 8). Avoid breathing dust. Avoid the creation of dust when handling and avoid all possible sources of ignition (spark or flame). Prevent dust accumulation. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Electrical equipment and lighting should be protected to appropriate standards to prevent dust coming into contact with hot surfaces, sparks or other ignition sources. Take precautionary measures against electrostatic discharges. To avoid fire or explosion, dissipate static electricity during transfer by earthing and bonding containers and equipment before transferring material.
	L-Tryptophan	Put on appropriate personal protective equipment (see Section 8). Avoid breathing dust. Avoid the creation of dust when handling and avoid all possible sources of ignition (spark or flame). Prevent dust accumulation. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Electrical equipment and lighting should be protected to appropriate standards to prevent dust coming into contact with hot surfaces, sparks or other ignition sources. Take precautionary measures against electrostatic discharges. To avoid fire or explosion, dissipate static electricity during transfer by earthing and bonding containers and equipment before transferring material.
	L-Norvaline	Put on appropriate personal protective equipment (see Section 8). Avoid breathing dust. Avoid the creation of dust when handling and avoid all possible sources of ignition (spark or flame). Prevent dust accumulation. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Electrical equipment and lighting should be protected to appropriate standards to prevent dust coming into contact with hot surfaces, sparks or other ignition sources. Take precautionary measures against electrostatic discharges. To avoid fire or explosion, dissipate static electricity during transfer by earthing and bonding containers and equipment before transferring

SECTION 7: Handling and storage

	L-Glutamine	material. Put on appropriate personal protective equipment (see Section 8). Avoid breathing dust. Avoid the creation of dust when handling and avoid all possible sources of ignition (spark or flame). Prevent dust accumulation. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Electrical equipment and lighting should be protected to appropriate standards to prevent dust coming into contact with hot surfaces, sparks or other ignition sources. Take precautionary measures against electrostatic discharges. To avoid fire or explosion, dissipate static electricity during transfer by earthing and bonding containers and equipment before transferring material.
	L-Asparagine	Put on appropriate personal protective equipment (see Section 8). Avoid breathing dust. Avoid the creation of dust when handling and avoid all possible sources of ignition (spark or flame). Prevent dust accumulation. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Electrical equipment and lighting should be protected to appropriate standards to prevent dust coming into contact with hot surfaces, sparks or other ignition sources. Take precautionary measures against electrostatic discharges. To avoid fire or explosion, dissipate static electricity during transfer by earthing and bonding containers and equipment before transferring material.
	L-4-Hydroxyproline	Put on appropriate personal protective equipment (see Section 8). Avoid breathing dust. Avoid the creation of dust when handling and avoid all possible sources of ignition (spark or flame). Prevent dust accumulation. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Electrical equipment and lighting should be protected to appropriate standards to prevent dust coming into contact with hot surfaces, sparks or other ignition sources. Take precautionary measures against electrostatic discharges. To avoid fire or explosion, dissipate static electricity during transfer by earthing and bonding containers and equipment before transferring material.
Advice on general occupational hygiene	: Sarcosine	Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.
	L-Tryptophan	Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.
	L-Norvaline	Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.
	L-Glutamine	Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and

SECTION 7: Handling and storage

L-Asparagine	protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures. Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.
L-4-Hydroxyproline	Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

7.2 Conditions for safe storage, including any incompatibilities

Storage	: L-Sarcosine	Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.
	L-Tryptophan	Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.
	L-Norvaline	Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.
	L-Glutamine	Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled

SECTION 7: Handling and storage

L-Asparagine	containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use. Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.
L-4-Hydroxyproline	Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.

7.3 Specific end use(s)

Recommendations	: Sarcosine	Industrial applications, Professional applications.
	L-Tryptophan	Industrial applications, Professional applications.
	L-Norvaline	Industrial applications, Professional applications.
	L-Glutamine	Industrial applications, Professional applications.
	L-Asparagine	Industrial applications, Professional applications.
	L-4-Hydroxyproline	Industrial applications, Professional applications.
Industrial sector specific solutions	: Sarcosine	Not applicable.
	L-Tryptophan	Not applicable.
	L-Norvaline	Not applicable.
	L-Glutamine	Not applicable.
	L-Asparagine	Not applicable.
	L-4-Hydroxyproline	Not applicable.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational exposure limits

No exposure limit value known.

Recommended monitoring procedures	: If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to monitoring standards, such as the following: European Standard EN 689 (Workplace atmospheres - Guidance for the assessment of exposure by inhalation to chemical agents for comparison with limit values and measurement strategy) European Standard EN 14042 (Workplace atmospheres - Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents) European Standard EN 482 (Workplace atmospheres - General requirements for the performance of procedures for the measurement of chemical agents) Reference to national guidance documents for methods for the determination of hazardous substances will also be required.
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SECTION 8: Exposure controls/personal protection

DNELs/DMELs

No DNELs/DMELs available.

PNECs

No PNECs available

8.2 Exposure controls

Appropriate engineering controls : Good general ventilation should be sufficient to control worker exposure to airborne contaminants.

Individual protection measures

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side-shields.

Skin protection

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection : Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance

Physical state	: Sarcosine	Solid. [Powder. Deliquescent solid.]
	L-Tryptophan	Solid. [Crystalline powder.]
	L-Norvaline	Solid. [Crystalline powder.]
	L-Glutamine	Solid. [Needles.]
	L-Asparagine	Solid. [Crystals.]
	L-4-Hydroxyproline	Solid. [Crystals.]
Colour	: Sarcosine	Not available.
	L-Tryptophan	White to yellowish.
	L-Norvaline	Not available.
	L-Glutamine	Not available.
	L-Asparagine	Not available.
	L-4-Hydroxyproline	White.

SECTION 9: Physical and chemical properties

Odour	: Sarcosine	Not available.
	L-Tryptophan	Odourless.
	L-Norvaline	Not available.
	L-Glutamine	Not available.
	L-Asparagine	Not available.
	L-4-Hydroxyproline	Odourless.
Odour threshold	: Sarcosine	Not available.
	L-Tryptophan	Not available.
	L-Norvaline	Not available.
	L-Glutamine	Not available.
	L-Asparagine	Not available.
	L-4-Hydroxyproline	Not available.
pH	: Sarcosine	Not available.
	L-Tryptophan	5.5 to 7 [Conc. (% w/w): 1%]
	L-Norvaline	Not available.
	L-Glutamine	Not available.
	L-Asparagine	Not available.
	L-4-Hydroxyproline	Not available.
Melting point/freezing point	: Sarcosine	208 to 212°C
	L-Tryptophan	278.3 to 279.3°C
	L-Norvaline	300°C
	L-Glutamine	Decomposition temperature: 185°C
	L-Asparagine	234 to 235°C
	L-4-Hydroxyproline	274°C
Initial boiling point and boiling range	: Sarcosine	Not available.
	L-Tryptophan	Not available.
	L-Norvaline	Not available.
	L-Glutamine	Not available.
	L-Asparagine	Not available.
	L-4-Hydroxyproline	Not available.
Flash point	: Sarcosine	Not available.
	L-Tryptophan	Not available.
	L-Norvaline	Not available.
	L-Glutamine	Not available.
	L-Asparagine	Not available.
	L-4-Hydroxyproline	Not available.
Evaporation rate	: Sarcosine	Not available.
	L-Tryptophan	Not available.
	L-Norvaline	Not available.
	L-Glutamine	Not available.
	L-Asparagine	Not available.
	L-4-Hydroxyproline	Not available.
Flammability (solid, gas)	: Sarcosine	Not available.
	L-Tryptophan	Not available.
	L-Norvaline	Not available.
	L-Glutamine	Not available.
	L-Asparagine	Not available.
	L-4-Hydroxyproline	Not available.
Upper/lower flammability or explosive limits	: Sarcosine	Not available.
	L-Tryptophan	Not available.
	L-Norvaline	Not available.
	L-Glutamine	Not available.
	L-Asparagine	Not available.
	L-4-Hydroxyproline	Not available.

SECTION 9: Physical and chemical properties

Vapour pressure	: Sarcosine	Not available.
	L-Tryptophan	0 kPa [room temperature]
	L-Norvaline	Not available.
	L-Glutamine	Not available.
	L-Asparagine	0.0000000064 kPa [room temperature]
	L-4-Hydroxyproline	Not available.
Vapour density	: Sarcosine	Not available.
	L-Tryptophan	Not available.
	L-Norvaline	Not available.
	L-Glutamine	Not available.
	L-Asparagine	Not available.
	L-4-Hydroxyproline	4.5 [Air = 1]
Relative density	: Sarcosine	Not available.
	L-Tryptophan	1.34
	L-Norvaline	Not available.
	L-Glutamine	Not available.
	L-Asparagine	Not available.
	L-4-Hydroxyproline	Not available.
Solubility(ies)	: Sarcosine	Soluble in the following materials: cold water and hot water.
	L-Tryptophan	Soluble in the following materials: cold water and hot water.
	L-Norvaline	Insoluble in the following materials: diethyl ether. Soluble in the following materials: cold water and hot water.
	L-Glutamine	Easily soluble in the following materials: cold water and hot water.
	L-Asparagine	Partially soluble in the following materials: cold water and hot water. Very slightly soluble in the following materials: methanol and diethyl ether.
	L-4-Hydroxyproline	Soluble in the following materials: cold water and hot water.
Partition coefficient: n-octanol/water	: Sarcosine	-2.78
	L-Tryptophan	-1.06
	L-Norvaline	-2.11
	L-Glutamine	-3.64
	L-Asparagine	-3.82
	L-4-Hydroxyproline	-3.17
Auto-ignition temperature	: Sarcosine	Not available.
	L-Tryptophan	>400°C
	L-Norvaline	Not available.
	L-Glutamine	Not available.
	L-Asparagine	Not available.
	L-4-Hydroxyproline	Not available.
Decomposition temperature	: Sarcosine	212°C
	L-Tryptophan	289°C
	L-Norvaline	Not available.
	L-Glutamine	185°C
	L-Asparagine	Not available.
	L-4-Hydroxyproline	275°C
Viscosity	: Sarcosine	Not available.
	L-Tryptophan	Not available.
	L-Norvaline	Not available.
	L-Glutamine	Not available.
	L-Asparagine	Not available.
	L-4-Hydroxyproline	Not available.

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SECTION 9: Physical and chemical properties

Explosive properties	: Sarcosine	Not available.
	L-Tryptophan	Not available.
	L-Norvaline	Not available.
	L-Glutamine	Not available.
	L-Asparagine	Not available.
	L-4-Hydroxyproline	Not available.
Oxidising properties	: Sarcosine	Not available.
	L-Tryptophan	Not available.
	L-Norvaline	Not available.
	L-Glutamine	Not available.
	L-Asparagine	Not available.
	L-4-Hydroxyproline	Not available.

9.2 Other information

No additional information.

SECTION 10: Stability and reactivity

10.1 Reactivity	: Sarcosine	No specific test data related to reactivity available for this product or its ingredients.
	L-Tryptophan	No specific test data related to reactivity available for this product or its ingredients.
	L-Norvaline	No specific test data related to reactivity available for this product or its ingredients.
	L-Glutamine	No specific test data related to reactivity available for this product or its ingredients.
	L-Asparagine	No specific test data related to reactivity available for this product or its ingredients.
	L-4-Hydroxyproline	No specific test data related to reactivity available for this product or its ingredients.
10.2 Chemical stability	: Sarcosine	The product is stable.
	L-Tryptophan	The product is stable.
	L-Norvaline	The product is stable.
	L-Glutamine	The product is stable.
	L-Asparagine	The product is stable.
	L-4-Hydroxyproline	The product is stable.
10.3 Possibility of hazardous reactions	: Sarcosine	Under normal conditions of storage and use, hazardous reactions will not occur.
	L-Tryptophan	Under normal conditions of storage and use, hazardous reactions will not occur.
	L-Norvaline	Under normal conditions of storage and use, hazardous reactions will not occur.
	L-Glutamine	Under normal conditions of storage and use, hazardous reactions will not occur.
	L-Asparagine	Under normal conditions of storage and use, hazardous reactions will not occur.
	L-4-Hydroxyproline	Under normal conditions of storage and use, hazardous reactions will not occur.
10.4 Conditions to avoid	: Sarcosine	Avoid the creation of dust when handling and avoid all possible sources of ignition (spark or flame). Take precautionary measures against electrostatic discharges. To avoid fire or explosion, dissipate static electricity during transfer by earthing and bonding containers and equipment before transferring material. Prevent dust accumulation.
	L-Tryptophan	Avoid the creation of dust when handling and avoid all possible sources of ignition (spark or flame). Take precautionary measures against electrostatic discharges. To

SECTION 10: Stability and reactivity

L-Norvaline	avoid fire or explosion, dissipate static electricity during transfer by earthing and bonding containers and equipment before transferring material. Prevent dust accumulation. Avoid the creation of dust when handling and avoid all possible sources of ignition (spark or flame). Take precautionary measures against electrostatic discharges. To avoid fire or explosion, dissipate static electricity during transfer by earthing and bonding containers and equipment before transferring material. Prevent dust accumulation.
L-Glutamine	Avoid the creation of dust when handling and avoid all possible sources of ignition (spark or flame). Take precautionary measures against electrostatic discharges. To avoid fire or explosion, dissipate static electricity during transfer by earthing and bonding containers and equipment before transferring material. Prevent dust accumulation.
L-Asparagine	Avoid the creation of dust when handling and avoid all possible sources of ignition (spark or flame). Take precautionary measures against electrostatic discharges. To avoid fire or explosion, dissipate static electricity during transfer by earthing and bonding containers and equipment before transferring material. Prevent dust accumulation.
L-4-Hydroxyproline	Avoid the creation of dust when handling and avoid all possible sources of ignition (spark or flame). Take precautionary measures against electrostatic discharges. To avoid fire or explosion, dissipate static electricity during transfer by earthing and bonding containers and equipment before transferring material. Prevent dust accumulation.

10.5 Incompatible materials

: Sarcosine	Reactive or incompatible with the following materials: oxidizing materials
L-Tryptophan	Reactive or incompatible with the following materials: oxidizing materials
L-Norvaline	Reactive or incompatible with the following materials: oxidizing materials
L-Glutamine	Reactive or incompatible with the following materials: oxidizing materials
L-Asparagine	Reactive or incompatible with the following materials: oxidizing materials
L-4-Hydroxyproline	Reactive or incompatible with the following materials: oxidizing materials

10.6 Hazardous decomposition products

: Sarcosine	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
L-Tryptophan	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
L-Norvaline	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
L-Glutamine	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
L-Asparagine	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
L-4-Hydroxyproline	Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
L-Tryptophan L-Tryptophan	LC50 Inhalation Dusts and mists	Rat - Male, Female	>5.17 mg/l	4 hours
	LD50 Oral	Rat	>16 g/kg	-
L-Glutamine Levoglutamide	LD50 Oral	Rat	7500 mg/kg	-

Acute toxicity estimates

Not available.

Irritation/Corrosion

Conclusion/Summary : Not available.

Sensitiser

Conclusion/Summary : Not available.

Specific target organ toxicity (single exposure)

Not available.

Specific target organ toxicity (repeated exposure)

Not available.

Aspiration hazard

Not available.

Information on likely routes of exposure

Sarcosine	Not available.
L-Tryptophan	Not available.
L-Norvaline	Not available.
L-Glutamine	Not available.
L-Asparagine	Not available.
L-4-Hydroxyproline	Not available.

Potential acute health effects

Inhalation	: Sarcosine	Exposure to airborne concentrations above statutory or recommended exposure limits may cause irritation of the nose, throat and lungs.
	L-Tryptophan	Exposure to airborne concentrations above statutory or recommended exposure limits may cause irritation of the nose, throat and lungs.
	L-Norvaline	Exposure to airborne concentrations above statutory or recommended exposure limits may cause irritation of the nose, throat and lungs.
	L-Glutamine	Exposure to airborne concentrations above statutory or recommended exposure limits may cause irritation of the nose, throat and lungs.
	L-Asparagine	Exposure to airborne concentrations above statutory or recommended exposure limits may cause irritation of the nose, throat and lungs.
	L-4-Hydroxyproline	Exposure to airborne concentrations above statutory or recommended exposure limits may cause irritation of the nose, throat and lungs.
Ingestion	: Sarcosine	No known significant effects or critical hazards.
	L-Tryptophan	No known significant effects or critical hazards.
	L-Norvaline	No known significant effects or critical hazards.
	L-Glutamine	No known significant effects or critical hazards.
	L-Asparagine	No known significant effects or critical hazards.
	L-4-Hydroxyproline	No known significant effects or critical hazards.

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Skin contact	: Sarcosine	No known significant effects or critical hazards.
	L-Tryptophan	No known significant effects or critical hazards.
	L-Norvaline	No known significant effects or critical hazards.
	L-Glutamine	No known significant effects or critical hazards.
	L-Asparagine	No known significant effects or critical hazards.
Eye contact	: Sarcosine	Exposure to airborne concentrations above statutory or recommended exposure limits may cause irritation of the eyes.
	L-Tryptophan	Exposure to airborne concentrations above statutory or recommended exposure limits may cause irritation of the eyes.
	L-Norvaline	Exposure to airborne concentrations above statutory or recommended exposure limits may cause irritation of the eyes.
	L-Glutamine	Exposure to airborne concentrations above statutory or recommended exposure limits may cause irritation of the eyes.
	L-Asparagine	Exposure to airborne concentrations above statutory or recommended exposure limits may cause irritation of the eyes.
	L-4-Hydroxyproline	Exposure to airborne concentrations above statutory or recommended exposure limits may cause irritation of the eyes.

Symptoms related to the physical, chemical and toxicological characteristics

Inhalation	: Sarcosine	Adverse symptoms may include the following: respiratory tract irritation coughing
	L-Tryptophan	Adverse symptoms may include the following: respiratory tract irritation coughing
	L-Norvaline	Adverse symptoms may include the following: respiratory tract irritation coughing
	L-Glutamine	Adverse symptoms may include the following: respiratory tract irritation coughing
	L-Asparagine	Adverse symptoms may include the following: respiratory tract irritation coughing
	L-4-Hydroxyproline	Adverse symptoms may include the following: respiratory tract irritation coughing
Ingestion	: Sarcosine	No specific data.
	L-Tryptophan	No specific data.
	L-Norvaline	No specific data.
	L-Glutamine	No specific data.
	L-Asparagine	No specific data.
	L-4-Hydroxyproline	No specific data.
Skin contact	: Sarcosine	No specific data.
	L-Tryptophan	No specific data.
	L-Norvaline	No specific data.
	L-Glutamine	No specific data.
	L-Asparagine	No specific data.
	L-4-Hydroxyproline	No specific data.

SECTION 11: Toxicological information

Eye contact	: Sarcosine	Adverse symptoms may include the following: irritation redness
	L-Tryptophan	Adverse symptoms may include the following: irritation redness
	L-Norvaline	Adverse symptoms may include the following: irritation redness
	L-Glutamine	Adverse symptoms may include the following: irritation redness
	L-Asparagine	Adverse symptoms may include the following: irritation redness
	L-4-Hydroxyproline	Adverse symptoms may include the following: irritation redness

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Short term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Potential chronic health effects

General	: Sarcosine	Repeated or prolonged inhalation of dust may lead to chronic respiratory irritation.
	L-Tryptophan	Repeated or prolonged inhalation of dust may lead to chronic respiratory irritation.
	L-Norvaline	Repeated or prolonged inhalation of dust may lead to chronic respiratory irritation.
	L-Glutamine	Repeated or prolonged inhalation of dust may lead to chronic respiratory irritation.
	L-Asparagine	Repeated or prolonged inhalation of dust may lead to chronic respiratory irritation.
	L-4-Hydroxyproline	Repeated or prolonged inhalation of dust may lead to chronic respiratory irritation.
Carcinogenicity	: Sarcosine	No known significant effects or critical hazards.
	L-Tryptophan	No known significant effects or critical hazards.
	L-Norvaline	No known significant effects or critical hazards.
	L-Glutamine	No known significant effects or critical hazards.
	L-Asparagine	No known significant effects or critical hazards.
	L-4-Hydroxyproline	No known significant effects or critical hazards.
Mutagenicity	: Sarcosine	No known significant effects or critical hazards.
	L-Tryptophan	No known significant effects or critical hazards.
	L-Norvaline	No known significant effects or critical hazards.
	L-Glutamine	No known significant effects or critical hazards.
	L-Asparagine	No known significant effects or critical hazards.
	L-4-Hydroxyproline	No known significant effects or critical hazards.

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Teratogenicity	:	Sarcosine L-Tryptophan L-Norvaline L-Glutamine L-Asparagine L-4-Hydroxyproline	No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards.
Developmental effects	:	Sarcosine L-Tryptophan L-Norvaline L-Glutamine L-Asparagine L-4-Hydroxyproline	No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards.
Fertility effects	:	Sarcosine L-Tryptophan L-Norvaline L-Glutamine L-Asparagine L-4-Hydroxyproline	No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards.

SECTION 12: Ecological information

12.1 Toxicity

Product/ingredient name	Result	Species	Exposure
L-Tryptophan L-Tryptophan	Acute EC50 >100 mg/l Fresh water Acute NOEC 100 mg/l Fresh water	Daphnia - Daphnia magna Daphnia - Daphnia magna	48 hours 48 hours

12.2 Persistence and degradability

Product/ingredient name	Test	Result	Dose	Inoculum
L-Tryptophan L-Tryptophan	OECD 301B Ready Biodegradability - CO2 Evolution Test	77 % - 28 days	-	-

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
L-Tryptophan L-Tryptophan	-	-	Readily

12.3 Bioaccumulative potential

Product/ingredient name	LogP _{ow}	BCF	Potential
Sarcosine Sarcosine	-2.78	-	low
L-Tryptophan L-Tryptophan	-1.06	-	low
L-Norvaline Norvaline	-2.11	-	low
L-Glutamine Levoglutamide	-3.64	-	low
L-Asparagine Asparagine	-3.82	-	low

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L-4-Hydroxyproline L-4-Hydroxyproline	-3.17	-	low
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12.4 Mobility in soil

Soil/water partition coefficient (K_{oc}) : Not available.

Mobility : Not available.

12.5 Results of PBT and vPvB assessment

PBT : Not applicable.

vPvB : Not applicable.

12.6 Other adverse effects : No known significant effects or critical hazards.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product

Methods of disposal : The generation of waste should be avoided or minimised wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction.

Hazardous waste : Within the present knowledge of the supplier, this product is not regarded as hazardous waste, as defined by EU Directive 2008/98/EC.

Packaging

Methods of disposal : The generation of waste should be avoided or minimised wherever possible. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible.

Special precautions : This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

SECTION 14: Transport information

ADR/RID / IMDG / IATA : Not regulated.

14.6 Special precautions for user : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

14.7 Transport in bulk according to Annex II of Marpol and the IBC Code : Not available.

SECTION 15: Regulatory information

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

EU Regulation (EC) No. 1907/2006 (REACH)

Annex XIV - List of substances subject to authorisation

Annex XIV

None of the components are listed.

Substances of very high concern

None of the components are listed.

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SECTION 15: Regulatory information

Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles	: Sarcosine	Not applicable.
	: L-Tryptophan	Not applicable.
	: L-Norvaline	Not applicable.
	: L-Glutamine	Not applicable.
	: L-Asparagine	Not applicable.
	: L-4-Hydroxyproline	Not applicable.

Other EU regulations

Ozone depleting substances (1005/2009/EU)

Not listed.

Prior Informed Consent (PIC) (649/2012/EU)

Not listed.

Seveso Directive

This product is not controlled under the Seveso Directive.

International regulations

Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

Montreal Protocol (Annexes A, B, C, E)

Not listed.

Stockholm Convention on Persistent Organic Pollutants

Not listed.

Rotterdam Convention on Prior Informed Consent (PIC)

Not listed.

UNECE Aarhus Protocol on POPs and Heavy Metals

Not listed.

Inventory list

Australia	: Not determined.
Canada	: Not determined.
China	: Not determined.
Europe	: All components are listed or exempted.
Japan	: <input checked="" type="checkbox"/> Japan inventory (ENCS) : All components are listed or exempted. <input checked="" type="checkbox"/> Japan inventory (ISHL) : All components are listed or exempted.
Malaysia	: Not determined.
New Zealand	: Not determined.
Philippines	: All components are listed or exempted.
Republic of Korea	: Not determined.
Taiwan	: All components are listed or exempted.
Thailand	: <input checked="" type="checkbox"/> Not determined.
Turkey	: Not determined.
United States	: All components are listed or exempted.
Viet Nam	: <input checked="" type="checkbox"/> Not determined.

15.2 Chemical safety assessment : This product contains substances for which Chemical Safety Assessments might still be required.

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SECTION 16: Other information

✔ Indicates information that has changed from previously issued version.

Abbreviations and acronyms

: ATE = Acute Toxicity Estimate
CLP = Classification, Labelling and Packaging Regulation [Regulation (EC) No. 1272/2008]
DNEL = Derived No Effect Level
EUH statement = CLP-specific Hazard statement
PNEC = Predicted No Effect Concentration
RRN = REACH Registration Number

Procedure used to derive the classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

Classification	Justification
Not classified.	

Full text of abbreviated H statements

Not applicable.

Full text of classifications [CLP/GHS]

Not applicable.

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Notice to reader

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