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-Trytophan 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

<table>
<thead>
<tr>
<th>Identified uses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sarcosine</td>
</tr>
<tr>
<td>L-Trytophan</td>
</tr>
<tr>
<td>L-Norvaline</td>
</tr>
<tr>
<td>L-Glutamine</td>
</tr>
<tr>
<td>L-Asparagine</td>
</tr>
<tr>
<td>L-4-Hydroxyproline</td>
</tr>
</tbody>
</table>

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-Trytophan 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.

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SECTION 2: Hazards identification

2.2 Label elements

**Signal word**
- Sarcosine: No signal word.
- L-Tryptophan: No signal word.
- L-Norvaline: No signal word.
- L-Glutamine: No signal word.
- L-Asparagine: No signal word.
- L-4-Hydroxyproline: No signal word.

**Hazard statements**
- 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.

**Precautionary statements**

**Prevention**
- Sarcosine: Not applicable.
- L-Tryptophan: Not applicable.
- L-Norvaline: Not applicable.
- L-Glutamine: Not applicable.
- L-Asparagine: Not applicable.
- L-4-Hydroxyproline: Not applicable.

**Response**
- Sarcosine: Not applicable.
- L-Tryptophan: Not applicable.
- L-Norvaline: Not applicable.
- L-Glutamine: Not applicable.
- L-Asparagine: Not applicable.
- L-4-Hydroxyproline: Not applicable.

**Storage**
- Sarcosine: Not applicable.
- L-Tryptophan: Not applicable.
- L-Norvaline: Not applicable.
- L-Glutamine: Not applicable.
- L-Asparagine: Not applicable.
- L-4-Hydroxyproline: Not applicable.

**Disposal**
- Sarcosine: Not applicable.
- L-Tryptophan: Not applicable.
- L-Norvaline: Not applicable.
- L-Glutamine: Not applicable.
- L-Asparagine: Not applicable.
- L-4-Hydroxyproline: Not applicable.

**Supplemental label elements**
- Sarcosine: Not applicable.
- L-Tryptophan: Not applicable.
- L-Norvaline: Not applicable.
- L-Glutamine: Not applicable.
- L-Asparagine: Not applicable.
- L-4-Hydroxyproline: Not applicable.

**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.

**Special packaging requirements**
- Sarcosine: Not applicable.
- L-Tryptophan: Not applicable.
- L-Norvaline: Not applicable.
- L-Glutamine: Not applicable.
- L-Asparagine: Not applicable.
- L-4-Hydroxyproline: Not applicable.

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SECTION 2: Hazards identification

2.3 Other hazards

Other hazards which do not result in classification:
- 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.

SECTION 3: Composition/information on ingredients

3.1 Substances:

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Identifiers</th>
<th>%</th>
<th>Regulation (EC) No. 1272/2008 [CLP]</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sarcosine</td>
<td>EC: 203-538-6 CAS: 107-97-1</td>
<td>100</td>
<td>Not classified.</td>
<td>[A]</td>
</tr>
<tr>
<td>L-Tryptophan</td>
<td>EC: 200-795-6 CAS: 73-22-3</td>
<td>100</td>
<td>Not classified.</td>
<td>[A]</td>
</tr>
<tr>
<td>L-Norvaline</td>
<td>EC: 229-543-3 CAS: 6600-40-4</td>
<td>100</td>
<td>Not classified.</td>
<td>[A]</td>
</tr>
<tr>
<td>L-Glutamine</td>
<td>EC: 200-292-1 CAS: 56-85-9</td>
<td>100</td>
<td>Not classified.</td>
<td>[A]</td>
</tr>
<tr>
<td>Levoglutamidade</td>
<td>EC: 200-735-9 CAS: 70-47-3</td>
<td>100</td>
<td>Not classified.</td>
<td>[A]</td>
</tr>
<tr>
<td>L-Asparagine</td>
<td>EC: 200-091-9 CAS: 51-35-4</td>
<td>100</td>
<td>Not classified.</td>
<td>[A]</td>
</tr>
</tbody>
</table>

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
- [5] Substance of equivalent concern
- [6] Additional disclosure due to company policy
- [A] Constituent
- [B] Impurity
- [C] Stabilising additive

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SECTION 4: First aid measures

4.1 Description of first aid measures

**Eye contact**

<table>
<thead>
<tr>
<th>Compound</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sarcosine</td>
<td>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.</td>
</tr>
<tr>
<td>L-Tryptophan</td>
<td>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.</td>
</tr>
<tr>
<td>L-Norvaline</td>
<td>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.</td>
</tr>
<tr>
<td>L-Glutamine</td>
<td>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.</td>
</tr>
<tr>
<td>L-Asparagine</td>
<td>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.</td>
</tr>
<tr>
<td>L-4-Hydroxyproline</td>
<td>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.</td>
</tr>
</tbody>
</table>

**Inhalation**

<table>
<thead>
<tr>
<th>Compound</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sarcosine</td>
<td>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.</td>
</tr>
<tr>
<td>L-Tryptophan</td>
<td>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.</td>
</tr>
<tr>
<td>L-Norvaline</td>
<td>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.</td>
</tr>
<tr>
<td>L-Glutamine</td>
<td>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.</td>
</tr>
<tr>
<td>L-Asparagine</td>
<td>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.</td>
</tr>
<tr>
<td>L-4-Hydroxyproline</td>
<td>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.</td>
</tr>
</tbody>
</table>
### SECTION 4: First aid measures

<table>
<thead>
<tr>
<th>Skin contact</th>
<th>Amino Acid</th>
<th>First aid measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sarcosine</td>
<td>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.</td>
<td><strong>Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.</strong></td>
</tr>
<tr>
<td>L-Tryptophan</td>
<td>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.</td>
<td><strong>Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.</strong></td>
</tr>
<tr>
<td>L-Norvaline</td>
<td>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.</td>
<td><strong>Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.</strong></td>
</tr>
<tr>
<td>L-Glutamine</td>
<td>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.</td>
<td><strong>Wash contaminated skin with soap and water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.</strong></td>
</tr>
<tr>
<td>L-Asparagine</td>
<td>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.</td>
<td><strong>Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.</strong></td>
</tr>
<tr>
<td>L-4-Hydroxyproline</td>
<td>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.</td>
<td><strong>Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.</strong></td>
</tr>
</tbody>
</table>

### Protection of first-aiders

<table>
<thead>
<tr>
<th>Protection of first-aiders</th>
<th>Amino Acid</th>
<th>First aid measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sarcosine</td>
<td>No action shall be taken involving any personal risk or without suitable training.</td>
<td><strong>No action shall be taken involving any personal risk or without suitable training.</strong></td>
</tr>
<tr>
<td>L-Tryptophan</td>
<td>No action shall be taken involving any personal risk or without suitable training.</td>
<td><strong>No action shall be taken involving any personal risk or without suitable training.</strong></td>
</tr>
<tr>
<td>L-Norvaline</td>
<td>No action shall be taken involving any personal risk or without suitable training.</td>
<td><strong>No action shall be taken involving any personal risk or without suitable training.</strong></td>
</tr>
<tr>
<td>L-Glutamine</td>
<td>No action shall be taken involving any personal risk or without suitable training.</td>
<td><strong>No action shall be taken involving any personal risk or without suitable training.</strong></td>
</tr>
</tbody>
</table>
SECTION 4: First aid measures

L-Asparagine  
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

<table>
<thead>
<tr>
<th>Eye contact</th>
<th>Sarcosine</th>
<th>Exposure to airborne concentrations above statutory or recommended exposure limits may cause irritation of the eyes.</th>
</tr>
</thead>
<tbody>
<tr>
<td>L-Tryptophan</td>
<td>Exposure to airborne concentrations above statutory or recommended exposure limits may cause irritation of the eyes.</td>
<td></td>
</tr>
<tr>
<td>L-Norvaline</td>
<td>Exposure to airborne concentrations above statutory or recommended exposure limits may cause irritation of the eyes.</td>
<td></td>
</tr>
<tr>
<td>L-Asparagine</td>
<td>Exposure to airborne concentrations above statutory or recommended exposure limits may cause irritation of the eyes.</td>
<td></td>
</tr>
<tr>
<td>L-4-Hydroxyproline</td>
<td>Exposure to airborne concentrations above statutory or recommended exposure limits may cause irritation of the eyes.</td>
<td></td>
</tr>
</tbody>
</table>

Inhalation

<table>
<thead>
<tr>
<th>Inhalation</th>
<th>Sarcosine</th>
<th>Exposure to airborne concentrations above statutory or recommended exposure limits may cause irritation of the nose, throat and lungs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>L-Tryptophan</td>
<td>Exposure to airborne concentrations above statutory or recommended exposure limits may cause irritation of the nose, throat and lungs.</td>
<td></td>
</tr>
<tr>
<td>L-Norvaline</td>
<td>Exposure to airborne concentrations above statutory or recommended exposure limits may cause irritation of the nose, throat and lungs.</td>
<td></td>
</tr>
<tr>
<td>L-Asparagine</td>
<td>Exposure to airborne concentrations above statutory or recommended exposure limits may cause irritation of the nose, throat and lungs.</td>
<td></td>
</tr>
<tr>
<td>L-4-Hydroxyproline</td>
<td>Exposure to airborne concentrations above statutory or recommended exposure limits may cause irritation of the nose, throat and lungs.</td>
<td></td>
</tr>
</tbody>
</table>

Skin contact

<table>
<thead>
<tr>
<th>Skin contact</th>
<th>Sarcosine</th>
<th>No known significant effects or critical hazards.</th>
</tr>
</thead>
<tbody>
<tr>
<td>L-Tryptophan</td>
<td>No known significant effects or critical hazards.</td>
<td></td>
</tr>
<tr>
<td>L-Norvaline</td>
<td>No known significant effects or critical hazards.</td>
<td></td>
</tr>
<tr>
<td>L-Asparagine</td>
<td>No known significant effects or critical hazards.</td>
<td></td>
</tr>
<tr>
<td>L-4-Hydroxyproline</td>
<td>No known significant effects or critical hazards.</td>
<td></td>
</tr>
</tbody>
</table>

Ingestion

<table>
<thead>
<tr>
<th>Ingestion</th>
<th>Sarcosine</th>
<th>No known significant effects or critical hazards.</th>
</tr>
</thead>
<tbody>
<tr>
<td>L-Tryptophan</td>
<td>No known significant effects or critical hazards.</td>
<td></td>
</tr>
<tr>
<td>L-Norvaline</td>
<td>No known significant effects or critical hazards.</td>
<td></td>
</tr>
<tr>
<td>L-Asparagine</td>
<td>No known significant effects or critical hazards.</td>
<td></td>
</tr>
<tr>
<td>L-4-Hydroxyproline</td>
<td>No known significant effects or critical hazards.</td>
<td></td>
</tr>
</tbody>
</table>

Over-exposure signs/symptoms

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### SECTION 4: First aid measures

<table>
<thead>
<tr>
<th>Exposure</th>
<th>Amino Acid</th>
<th>Adverse symptoms may include the following:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Eye contact</strong></td>
<td>Sarcosine</td>
<td>respiratory tract irritation</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>coughing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>L-Tryptophan</td>
<td>respiratory tract irritation</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>coughing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>L-Norvaline</td>
<td>respiratory tract irritation</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>coughing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>L-Glutamine</td>
<td>respiratory tract irritation</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>coughing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>L-Asparagine</td>
<td>respiratory tract irritation</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>coughing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>L-4-Hydroxyproline</td>
<td>respiratory tract irritation</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>coughing</td>
<td></td>
</tr>
<tr>
<td><strong>Inhalation</strong></td>
<td>Sarcosine</td>
<td>respiratory tract irritation</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>coughing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>L-Tryptophan</td>
<td>respiratory tract irritation</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>coughing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>L-Norvaline</td>
<td>respiratory tract irritation</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>coughing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>L-Glutamine</td>
<td>respiratory tract irritation</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>coughing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>L-Asparagine</td>
<td>respiratory tract irritation</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>coughing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>L-4-Hydroxyproline</td>
<td>respiratory tract irritation</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>coughing</td>
<td></td>
</tr>
<tr>
<td><strong>Skin contact</strong></td>
<td>Sarcosine</td>
<td>No specific data.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>L-Tryptophan</td>
<td>No specific data.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>L-Norvaline</td>
<td>No specific data.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>L-Glutamine</td>
<td>No specific data.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>L-Asparagine</td>
<td>No specific data.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>L-4-Hydroxyproline</td>
<td>No specific data.</td>
<td></td>
</tr>
<tr>
<td><strong>Ingestion</strong></td>
<td>Sarcosine</td>
<td>No specific data.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>L-Tryptophan</td>
<td>No specific data.</td>
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<td>L-Norvaline</td>
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<td></td>
<td>L-Asparagine</td>
<td>No specific data.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>L-4-Hydroxyproline</td>
<td>No specific data.</td>
<td></td>
</tr>
</tbody>
</table>

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,
SECTION 4: First aid measures

L-Asparagine
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
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-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 explosive dust-air mixture.
- L-Tryptophan: Avoid high pressure media which could cause the formation of a potentially explosive dust-air mixture.
- L-Norvaline: Avoid high pressure media which could cause the formation of a potentially explosive dust-air mixture.
- L-Glutamine: Avoid high pressure media which could cause the formation of a potentially explosive dust-air mixture.
- L-Asparagine: Avoid high pressure media which could cause the formation of a potentially explosive dust-air mixture.
- L-4-Hydroxyproline: Avoid high pressure media which could cause the formation of a potentially explosive dust-air mixture.

5.2 Special hazards arising from the substance or mixture

Hazards from the substance or mixture:
- Sarcosine: May form exploisible dust-air mixture if dispersed.
- L-Tryptophan: May form exploisible dust-air mixture if dispersed.
- L-Norvaline: May form exploisible dust-air mixture if dispersed.
- L-Glutamine: May form exploisible dust-air mixture if dispersed.
- L-Asparagine: May form exploisible dust-air mixture if dispersed.
- L-4-Hydroxyproline: May form exploisible 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:
SECTION 5: Firefighting measures

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) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.

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SECTION 5: Firefighting measures

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 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

### 6.2 Environmental precautions

<table>
<thead>
<tr>
<th>For emergency responders</th>
<th>Amino Acid</th>
<th>Precautions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sarcosine</td>
<td>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).</td>
</tr>
<tr>
<td></td>
<td>L-Tryptophan</td>
<td>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).</td>
</tr>
<tr>
<td></td>
<td>L-Norvaline</td>
<td>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).</td>
</tr>
<tr>
<td></td>
<td>L-Glutamine</td>
<td>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).</td>
</tr>
<tr>
<td></td>
<td>L-Asparagine</td>
<td>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).</td>
</tr>
<tr>
<td></td>
<td>L-4-Hydroxyproline</td>
<td>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).</td>
</tr>
</tbody>
</table>

### 6.3 Methods and material for containment and cleaning up

<table>
<thead>
<tr>
<th>Methods for cleaning up</th>
<th>Amino Acid</th>
<th>Instructions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sarcosine</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>L-Tryptophan</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>L-Norvaline</td>
<td>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.</td>
</tr>
</tbody>
</table>

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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.

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 material.
SECTION 7: Handling and storage

L-Glutamine
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

7.2 Conditions for safe storage, including any incompatibilities

Storage: 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-Asparagine
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.

L-Tryptophan
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.

Sarcosine
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
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
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.

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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. 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.
  - Insoluble in the following materials: diethyl ether.
- **L-Norvaline**: 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.
SECTION 9: Physical and chemical properties

Explosive properties

<table>
<thead>
<tr>
<th>Amino Acid</th>
<th>Availability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sarcosine</td>
<td>Not available.</td>
</tr>
<tr>
<td>L-Tryptophan</td>
<td>Not available.</td>
</tr>
<tr>
<td>L-Norvaline</td>
<td>Not available.</td>
</tr>
<tr>
<td>L-Glutamine</td>
<td>Not available.</td>
</tr>
<tr>
<td>L-Asparagine</td>
<td>Not available.</td>
</tr>
<tr>
<td>L-4-Hydroxyproline</td>
<td>Not available.</td>
</tr>
</tbody>
</table>

Oxidising properties

<table>
<thead>
<tr>
<th>Amino Acid</th>
<th>Availability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sarcosine</td>
<td>Not available.</td>
</tr>
<tr>
<td>L-Tryptophan</td>
<td>Not available.</td>
</tr>
<tr>
<td>L-Norvaline</td>
<td>Not available.</td>
</tr>
<tr>
<td>L-Glutamine</td>
<td>Not available.</td>
</tr>
<tr>
<td>L-Asparagine</td>
<td>Not available.</td>
</tr>
<tr>
<td>L-4-Hydroxyproline</td>
<td>Not available.</td>
</tr>
</tbody>
</table>

9.2 Other information

No additional information.

SECTION 10: Stability and reactivity

10.1 Reactivity

<table>
<thead>
<tr>
<th>Amino Acid</th>
<th>Reactivity Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sarcosine</td>
<td>No specific test data related to reactivity available for this product or its ingredients.</td>
</tr>
<tr>
<td>L-Tryptophan</td>
<td>No specific test data related to reactivity available for this product or its ingredients.</td>
</tr>
<tr>
<td>L-Norvaline</td>
<td>No specific test data related to reactivity available for this product or its ingredients.</td>
</tr>
<tr>
<td>L-Glutamine</td>
<td>No specific test data related to reactivity available for this product or its ingredients.</td>
</tr>
<tr>
<td>L-Asparagine</td>
<td>No specific test data related to reactivity available for this product or its ingredients.</td>
</tr>
<tr>
<td>L-4-Hydroxyproline</td>
<td>No specific test data related to reactivity available for this product or its ingredients.</td>
</tr>
</tbody>
</table>

10.2 Chemical stability

<table>
<thead>
<tr>
<th>Amino Acid</th>
<th>Stability Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sarcosine</td>
<td>The product is stable.</td>
</tr>
<tr>
<td>L-Tryptophan</td>
<td>The product is stable.</td>
</tr>
<tr>
<td>L-Norvaline</td>
<td>The product is stable.</td>
</tr>
<tr>
<td>L-Glutamine</td>
<td>The product is stable.</td>
</tr>
<tr>
<td>L-Asparagine</td>
<td>The product is stable.</td>
</tr>
<tr>
<td>L-4-Hydroxyproline</td>
<td>The product is stable.</td>
</tr>
</tbody>
</table>

10.3 Possibility of hazardous reactions

<table>
<thead>
<tr>
<th>Amino Acid</th>
<th>Hazardous Reaction Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sarcosine</td>
<td>Under normal conditions of storage and use, hazardous reactions will not occur.</td>
</tr>
<tr>
<td>L-Tryptophan</td>
<td>Under normal conditions of storage and use, hazardous reactions will not occur.</td>
</tr>
<tr>
<td>L-Norvaline</td>
<td>Under normal conditions of storage and use, hazardous reactions will not occur.</td>
</tr>
<tr>
<td>L-Glutamine</td>
<td>Under normal conditions of storage and use, hazardous reactions will not occur.</td>
</tr>
<tr>
<td>L-Asparagine</td>
<td>Under normal conditions of storage and use, hazardous reactions will not occur.</td>
</tr>
<tr>
<td>L-4-Hydroxyproline</td>
<td>Under normal conditions of storage and use, hazardous reactions will not occur.</td>
</tr>
</tbody>
</table>

10.4 Conditions to avoid

<table>
<thead>
<tr>
<th>Amino Acid</th>
<th>Conditions to Avoid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sarcosine</td>
<td>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.</td>
</tr>
</tbody>
</table>
| 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

10.6 Hazardous decomposition products

<table>
<thead>
<tr>
<th>Amino Acid</th>
<th>Hazardous Decomposition Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>L-Norvaline</td>
<td>Under normal conditions of storage and use, hazardous decomposition products should not be produced.</td>
</tr>
<tr>
<td>L-Glutamine</td>
<td>Under normal conditions of storage and use, hazardous decomposition products should not be produced.</td>
</tr>
<tr>
<td>L-Asparagine</td>
<td>Under normal conditions of storage and use, hazardous decomposition products should not be produced.</td>
</tr>
<tr>
<td>L-4-Hydroxyproline</td>
<td>Under normal conditions of storage and use, hazardous decomposition products should not be produced.</td>
</tr>
<tr>
<td>Sarcosine</td>
<td>Reactive or incompatible with the following materials: oxidizing materials</td>
</tr>
<tr>
<td>L-Tryptophan</td>
<td>Reactive or incompatible with the following materials: oxidizing materials</td>
</tr>
<tr>
<td>L-Norvaline</td>
<td>Reactive or incompatible with the following materials: oxidizing materials</td>
</tr>
<tr>
<td>L-Glutamine</td>
<td>Reactive or incompatible with the following materials: oxidizing materials</td>
</tr>
<tr>
<td>L-Asparagine</td>
<td>Reactive or incompatible with the following materials: oxidizing materials</td>
</tr>
<tr>
<td>L-4-Hydroxyproline</td>
<td>Reactive or incompatible with the following materials: oxidizing materials</td>
</tr>
</tbody>
</table>

10.5 Incompatible materials

<table>
<thead>
<tr>
<th>Amino Acid</th>
<th>Incompatible Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sarcosine</td>
<td>Reactive or incompatible with the following materials: oxidizing materials</td>
</tr>
<tr>
<td>L-Tryptophan</td>
<td>Reactive or incompatible with the following materials: oxidizing materials</td>
</tr>
<tr>
<td>L-Norvaline</td>
<td>Reactive or incompatible with the following materials: oxidizing materials</td>
</tr>
<tr>
<td>L-Glutamine</td>
<td>Reactive or incompatible with the following materials: oxidizing materials</td>
</tr>
<tr>
<td>L-Asparagine</td>
<td>Reactive or incompatible with the following materials: oxidizing materials</td>
</tr>
<tr>
<td>L-4-Hydroxyproline</td>
<td>Reactive or incompatible with the following materials: oxidizing materials</td>
</tr>
</tbody>
</table>

Avoid fire or explosion, dissipate static electricity during transfer by earthing and bonding containers and equipment before transferring material. Prevent dust accumulation.

L-Norvaline
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.
### 11.1 Information on toxicological effects

#### Acute toxicity

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Dose</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>L-Trytophan</td>
<td>LC50 Inhalation Dusts and mists</td>
<td>Rat - Male, Female</td>
<td>&gt;5.17 mg/l</td>
<td>4 hours</td>
</tr>
<tr>
<td></td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>&gt;16 g/kg</td>
<td>-</td>
</tr>
<tr>
<td>L-Glutamine</td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>7500 mg/kg</td>
<td>-</td>
</tr>
</tbody>
</table>

**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-Trytophan : 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-Trytophan : 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-Trytophan : 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.
**Amino Acid Supplement Kit - For R&D Only, Part Number 5062-2478**

**SECTION 11: Toxicological information**

<table>
<thead>
<tr>
<th>Skin contact</th>
<th>Amino Acid</th>
<th>Toxicological information</th>
</tr>
</thead>
<tbody>
<tr>
<td>L-Sarcosine</td>
<td>No known significant effects or critical hazards.</td>
<td></td>
</tr>
<tr>
<td>L-Tryptophan</td>
<td>No known significant effects or critical hazards.</td>
<td></td>
</tr>
<tr>
<td>L-Norvaline</td>
<td>No known significant effects or critical hazards.</td>
<td></td>
</tr>
<tr>
<td>L-Glutamine</td>
<td>No known significant effects or critical hazards.</td>
<td></td>
</tr>
<tr>
<td>L-Asparagine</td>
<td>No known significant effects or critical hazards.</td>
<td></td>
</tr>
<tr>
<td>L-4-Hydroxyproline</td>
<td>No known significant effects or critical hazards.</td>
<td></td>
</tr>
</tbody>
</table>

**Eye contact**

<table>
<thead>
<tr>
<th>Amino Acid</th>
<th>Toxicological information</th>
</tr>
</thead>
<tbody>
<tr>
<td>L-Sarcosine</td>
<td>Exposure to airborne concentrations above statutory or recommended exposure limits may cause irritation of the eyes.</td>
</tr>
<tr>
<td>L-Tryptophan</td>
<td>Exposure to airborne concentrations above statutory or recommended exposure limits may cause irritation of the eyes.</td>
</tr>
<tr>
<td>L-Norvaline</td>
<td>Exposure to airborne concentrations above statutory or recommended exposure limits may cause irritation of the eyes.</td>
</tr>
<tr>
<td>L-Glutamine</td>
<td>Exposure to airborne concentrations above statutory or recommended exposure limits may cause irritation of the eyes.</td>
</tr>
<tr>
<td>L-Asparagine</td>
<td>Exposure to airborne concentrations above statutory or recommended exposure limits may cause irritation of the eyes.</td>
</tr>
<tr>
<td>L-4-Hydroxyproline</td>
<td>Exposure to airborne concentrations above statutory or recommended exposure limits may cause irritation of the eyes.</td>
</tr>
</tbody>
</table>

**Symptoms related to the physical, chemical and toxicological characteristics**

**Inhalation**

<table>
<thead>
<tr>
<th>Amino Acid</th>
<th>Toxicological information</th>
</tr>
</thead>
<tbody>
<tr>
<td>L-Sarcosine</td>
<td>Adverse symptoms may include the following: respiratory tract irritation coughing</td>
</tr>
<tr>
<td>L-Tryptophan</td>
<td>Adverse symptoms may include the following: respiratory tract irritation coughing</td>
</tr>
<tr>
<td>L-Norvaline</td>
<td>Adverse symptoms may include the following: respiratory tract irritation coughing</td>
</tr>
<tr>
<td>L-Glutamine</td>
<td>Adverse symptoms may include the following: respiratory tract irritation coughing</td>
</tr>
<tr>
<td>L-Asparagine</td>
<td>Adverse symptoms may include the following: respiratory tract irritation coughing</td>
</tr>
<tr>
<td>L-4-Hydroxyproline</td>
<td>Adverse symptoms may include the following: respiratory tract irritation coughing</td>
</tr>
</tbody>
</table>

**Ingestion**

<table>
<thead>
<tr>
<th>Amino Acid</th>
<th>Toxicological information</th>
</tr>
</thead>
<tbody>
<tr>
<td>L-Sarcosine</td>
<td>No specific data.</td>
</tr>
<tr>
<td>L-Tryptophan</td>
<td>No specific data.</td>
</tr>
<tr>
<td>L-Norvaline</td>
<td>No specific data.</td>
</tr>
<tr>
<td>L-Glutamine</td>
<td>No specific data.</td>
</tr>
<tr>
<td>L-Asparagine</td>
<td>No specific data.</td>
</tr>
<tr>
<td>L-4-Hydroxyproline</td>
<td>No specific data.</td>
</tr>
</tbody>
</table>

**Skin contact**

<table>
<thead>
<tr>
<th>Amino Acid</th>
<th>Toxicological information</th>
</tr>
</thead>
<tbody>
<tr>
<td>L-Sarcosine</td>
<td>No specific data.</td>
</tr>
<tr>
<td>L-Tryptophan</td>
<td>No specific data.</td>
</tr>
<tr>
<td>L-Norvaline</td>
<td>No specific data.</td>
</tr>
<tr>
<td>L-Glutamine</td>
<td>No specific data.</td>
</tr>
<tr>
<td>L-Asparagine</td>
<td>No specific data.</td>
</tr>
<tr>
<td>L-4-Hydroxyproline</td>
<td>No specific data.</td>
</tr>
</tbody>
</table>
### SECTION 11: Toxicological information

#### Potential chronic health effects

<table>
<thead>
<tr>
<th>Eye contact</th>
<th>Adverse symptoms may include the following:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sarcosine</td>
<td>irritation</td>
</tr>
<tr>
<td>L-Tryptophan</td>
<td>irritation</td>
</tr>
<tr>
<td>L-Norvaline</td>
<td>irritation</td>
</tr>
<tr>
<td>L-Glutamine</td>
<td>irritation</td>
</tr>
<tr>
<td>L-Asparagine</td>
<td>irritation</td>
</tr>
<tr>
<td>L-4-Hydroxyproline</td>
<td>irritation</td>
</tr>
</tbody>
</table>

#### 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.

#### 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.
SECTION 11: Toxicological information

Teratogenicity:
- Sarcosine: No known significant effects or critical hazards.
- L-Trytophan: No known significant effects or critical hazards.
- L-Norvaline: 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.

Developmental effects:
- Sarcosine: No known significant effects or critical hazards.
- L-Trytophan: No known significant effects or critical hazards.
- L-Norvaline: 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.

Fertility effects:
- Sarcosine: No known significant effects or critical hazards.
- L-Trytophan: No known significant effects or critical hazards.
- L-Norvaline: 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.

SECTION 12: Ecological information

12.1 Toxicity

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>L-Tryptophan/L-Trytophan</td>
<td>Acute EC50 &gt;100 mg/l Fresh water</td>
<td>Daphnia - Daphnia magna</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute NOEC 100 mg/l Fresh water</td>
<td>Daphnia - Daphnia magna</td>
<td>48 hours</td>
</tr>
</tbody>
</table>

12.2 Persistence and degradability

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Test</th>
<th>Result</th>
<th>Dose</th>
<th>Inoculum</th>
</tr>
</thead>
<tbody>
<tr>
<td>L-Tryptophan/L-Trytophan</td>
<td>OECD 301B Ready Biodegradability CO2 Evolution Test</td>
<td>77 % - 28 days</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Aquatic half-life</th>
<th>Photolysis</th>
<th>Biodegradability</th>
</tr>
</thead>
<tbody>
<tr>
<td>L-Tryptophan/L-Trytophan</td>
<td>-</td>
<td>Readily</td>
</tr>
</tbody>
</table>

12.3 Bioaccumulative potential

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>LogPow</th>
<th>BCF</th>
<th>Potential</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sarcosine</td>
<td>-2.78</td>
<td>-</td>
<td>low</td>
</tr>
<tr>
<td>L-Tryptophan/L-Trytophan</td>
<td>-1.06</td>
<td>-</td>
<td>low</td>
</tr>
<tr>
<td>L-Norvaline/Norvaline</td>
<td>-2.11</td>
<td>-</td>
<td>low</td>
</tr>
<tr>
<td>L-Glutamine/Levoglutamid</td>
<td>-3.64</td>
<td>-</td>
<td>low</td>
</tr>
<tr>
<td>L-Asparagine/Asparagine</td>
<td>-3.82</td>
<td>-</td>
<td>low</td>
</tr>
</tbody>
</table>

Date of issue/Date of revision: 17/05/2017
SECTION 12: Ecological information

<table>
<thead>
<tr>
<th>Amino Acid Supplement Kit - For R&amp;D Only, Part Number 5062-2478</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>12.4 Mobility in soil</strong></td>
</tr>
<tr>
<td><strong>L-4-Hydroxyproline</strong></td>
</tr>
<tr>
<td><strong>Soil/water partition coefficient (K_{oc})</strong></td>
</tr>
<tr>
<td><strong>Mobility</strong></td>
</tr>
</tbody>
</table>

| **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

| **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. |

Date of issue/Date of revision: 17/05/2017
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**:
  - **Japan inventory (ENCS)**: All components are listed or exempted.
  - **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**: Not determined.
- **Turkey**: Not determined.
- **United States**: All components are listed or exempted.
- **Viet Nam**: Not determined.

**15.2 Chemical safety assessment**

- This product contains substances for which Chemical Safety Assessments might still be required.

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

<table>
<thead>
<tr>
<th>Classification</th>
<th>Justification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not classified.</td>
<td></td>
</tr>
</tbody>
</table>

Full text of abbreviated H statements

Not applicable.

Full text of classifications [CLP/GHS]

Not applicable.

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

Date of previous issue: 29/01/2016.

Version: 2

Notice to reader

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