



LABELED AMINO ACID STANDARDS SET A

Novachem Pty Ltd

Version No: 3.4

Safety Data Sheet according to WHS Regulations (Hazardous Chemicals) Amendment 2020 and ADG requirements

Chemwatch Hazard Alert Code: 2

Issue Date: 28/05/2023

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S.GHS.AUS.EN

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

Product Identifier

Product name	LABELED AMINO ACID STANDARDS SET A
Synonyms	Not Available
Other means of identification	NSK-A

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

Relevant identified uses	For professional use only
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Details of the manufacturer or supplier of the safety data sheet

Registered company name	Novachem Pty Ltd	Novachem Pty Ltd
Address	25 Crissane Road, Heidelberg West Victoria 3081 Australia	25 Crissane Road, Heidelberg West Victoria 3081 Australia
Telephone	+61384151255	+61384151255
Fax	+61386250088	+61386250088
Website	www.novachem.com.au	www.novachem.com.au
Email	novachem@novachem.com.au	novachem@novachem.com.au

Emergency telephone number

Association / Organisation	Victorian Poisons Information Centre	Victorian Poisons Information Centre
Emergency telephone numbers	13 11 26	13 11 26
Other emergency telephone numbers	Not Available	Not Available

SECTION 2 Hazards identification

Classification of the substance or mixture

Poisons Schedule	Not Applicable
Classification [1]	Serious Eye Damage/Eye Irritation Category 2A, Reproductive Toxicity Category 2, Specific Target Organ Toxicity - Repeated Exposure Category 2, Skin Corrosion/Irritation Category 2
Legend:	1. Classified by Chemwatch; 2. Classification drawn from HCIS; 3. Classification drawn from Regulation (EU) No 1272/2008 - Annex VI

Label elements

Hazard pictogram(s)	
Signal word	Warning

Hazard statement(s)

H319	Causes serious eye irritation.
H361d	Suspected of damaging the unborn child.
H373	May cause damage to organs through prolonged or repeated exposure.
H315	Causes skin irritation.

Precautionary statement(s) Prevention

P201	Obtain special instructions before use.
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P260	Do not breathe dust/fume.
P280	Wear protective gloves, protective clothing, eye protection and face protection.
P264	Wash all exposed external body areas thoroughly after handling.

Precautionary statement(s) Response

P308+P313	IF exposed or concerned: Get medical advice/ attention.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P314	Get medical advice/attention if you feel unwell.
P337+P313	If eye irritation persists: Get medical advice/attention.

Precautionary statement(s) Storage

P405	Store locked up.
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Precautionary statement(s) Disposal

P501	Dispose of contents/container to authorised hazardous or special waste collection point in accordance with any local regulation.
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SECTION 3 Composition / information on ingredients

Substances

See section below for composition of Mixtures

Mixtures

CAS No	%[weight]	Name
91795-59-4	18.356329	<u>glycine-2-13C-15N, 99 atom% 13 C, 98 atom% 15 N</u>
1119-34-2	10.277944	<u>arginine monohydrochloride</u>
60-18-4	8.918216	<u>L-tyrosine</u>
372-75-8	8.44831	<u>L-citrulline</u>
63-91-2	8.158368	<u>L-phenylalanine</u>
3184-13-2	8.128374	<u>ornithine hydrochloride</u>
13010-53-2	7.258548	<u>methionine-d3 (methyl-d3)</u>
56-86-0	7.158568	<u>L-glutamic acid</u>
56-84-8	6.488702	<u>L-aspartic acid</u>
87828-86-2	6.39872	<u>L-leucine-d3</u>
72-18-4	5.968806	<u>L-valine</u>
18806-29-6	4.439112	<u>L-alanine-2,3,3,3-D4</u>

Legend: 1. Classified by Chemwatch; 2. Classification drawn from HCIS; 3. Classification drawn from Regulation (EU) No 1272/2008 - Annex VI; 4. Classification drawn from C&L; * EU IOELVs available

SECTION 4 First aid measures

Description of first aid measures

Eye Contact	<p>If this product comes in contact with the eyes:</p> <ul style="list-style-type: none"> ▶ Wash out immediately with fresh running water. ▶ Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids. ▶ Seek medical attention without delay; if pain persists or recurs seek medical attention. ▶ Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.
Skin Contact	<p>If skin contact occurs:</p> <ul style="list-style-type: none"> ▶ Immediately remove all contaminated clothing, including footwear. ▶ Flush skin and hair with running water (and soap if available). ▶ Seek medical attention in event of irritation.
Inhalation	<ul style="list-style-type: none"> ▶ If dust is inhaled, remove from contaminated area. ▶ Encourage patient to blow nose to ensure clear passage of breathing. ▶ If irritation or discomfort persists seek medical attention.
Ingestion	<ul style="list-style-type: none"> ▶ Immediately give a glass of water. ▶ First aid is not generally required. If in doubt, contact a Poisons Information Centre or a doctor.

Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

SECTION 5 Firefighting measures

Extinguishing media

- ▶ Foam.
- ▶ Dry chemical powder.

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- ▶ BCF (where regulations permit).
- ▶ Carbon dioxide.

Special hazards arising from the substrate or mixture

Fire Incompatibility	▶ Avoid contamination with oxidising agents i.e. nitrates, oxidising acids, chlorine bleaches, pool chlorine etc. as ignition may result
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Advice for firefighters

Fire Fighting	<ul style="list-style-type: none"> ▶ Alert Fire Brigade and tell them location and nature of hazard. ▶ Wear breathing apparatus plus protective gloves. ▶ Prevent, by any means available, spillage from entering drains or water courses. ▶ Use water delivered as a fine spray to control fire and cool adjacent area.
Fire/Explosion Hazard	<ul style="list-style-type: none"> ▶ Combustible solid which burns but propagates flame with difficulty; it is estimated that most organic dusts are combustible (circa 70%) - according to the circumstances under which the combustion process occurs, such materials may cause fires and / or dust explosions. ▶ Organic powders when finely divided over a range of concentrations regardless of particulate size or shape and suspended in air or some other oxidizing medium may form explosive dust-air mixtures and result in a fire or dust explosion (including secondary explosions). ▶ Avoid generating dust, particularly clouds of dust in a confined or unventilated space as dusts may form an explosive mixture with air, and any source of ignition, i.e. flame or spark, will cause fire or explosion. Dust clouds generated by the fine grinding of the solid are a particular hazard; accumulations of fine dust (420 micron or less) may burn rapidly and fiercely if ignited - particles exceeding this limit will generally not form flammable dust clouds; once initiated, however, larger particles up to 1400 microns diameter will contribute to the propagation of an explosion. <p>Combustion products include: carbon monoxide (CO) carbon dioxide (CO₂) hydrogen chloride phosgene nitrogen oxides (NO_x) other pyrolysis products typical of burning organic material. May emit poisonous fumes. May emit corrosive fumes.</p>
HAZCHEM	Not Applicable

SECTION 6 Accidental release measures

Personal precautions, protective equipment and emergency procedures

See section 8

Environmental precautions

See section 12

Methods and material for containment and cleaning up

Minor Spills	<ul style="list-style-type: none"> ▶ Clean up waste regularly and abnormal spills immediately. ▶ Avoid breathing dust and contact with skin and eyes. ▶ Wear protective clothing, gloves, safety glasses and dust respirator. ▶ Use dry clean up procedures and avoid generating dust.
Major Spills	<p>Moderate hazard.</p> <ul style="list-style-type: none"> ▶ CAUTION: Advise personnel in area. ▶ Alert Emergency Services and tell them location and nature of hazard. ▶ Control personal contact by wearing protective clothing.

Personal Protective Equipment advice is contained in Section 8 of the SDS.

SECTION 7 Handling and storage

Precautions for safe handling

Safe handling	<ul style="list-style-type: none"> ▶ Avoid all personal contact, including inhalation. ▶ Wear protective clothing when risk of exposure occurs. ▶ Use in a well-ventilated area. ▶ Prevent concentration in hollows and sumps. ▶ Organic powders when finely divided over a range of concentrations regardless of particulate size or shape and suspended in air or some other oxidizing medium may form explosive dust-air mixtures and result in a fire or dust explosion (including secondary explosions) ▶ Minimise airborne dust and eliminate all ignition sources. Keep away from heat, hot surfaces, sparks, and flame. ▶ Establish good housekeeping practices. ▶ Remove dust accumulations on a regular basis by vacuuming or gentle sweeping to avoid creating dust clouds.
Other information	<ul style="list-style-type: none"> ▶ Store in original containers. ▶ Keep containers securely sealed. ▶ Store in a cool, dry area protected from environmental extremes. ▶ Store away from incompatible materials and foodstuff containers.

Conditions for safe storage, including any incompatibilities

Suitable container	<ul style="list-style-type: none"> ▶ Glass container is suitable for laboratory quantities ▶ Polyethylene or polypropylene container. ▶ Check all containers are clearly labelled and free from leaks.
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Storage incompatibility

► Avoid reaction with oxidising agents

SECTION 8 Exposure controls / personal protection

Control parameters

Occupational Exposure Limits (OEL)

INGREDIENT DATA

Not Available

Emergency Limits

Ingredient	TEEL-1	TEEL-2	TEEL-3
LABELED AMINO ACID STANDARDS SET A	Not Available	Not Available	Not Available


Ingredient	Original IDLH	Revised IDLH
glycine-2-13C-15N, 99 atom% 13 C, 98 atom% 15 N	Not Available	Not Available
arginine monohydrochloride	Not Available	Not Available
L-tyrosine	Not Available	Not Available
L-citrulline	Not Available	Not Available
L-phenylalanine	Not Available	Not Available
ornithine hydrochloride	Not Available	Not Available
methionine-d3 (methyl-d3)	Not Available	Not Available
L-glutamic acid	Not Available	Not Available
L-aspartic acid	Not Available	Not Available
L-leucine-d3	Not Available	Not Available
L-valine	Not Available	Not Available
L-alanine-2,3,3,3-D4	Not Available	Not Available

Occupational Exposure Banding

Ingredient	Occupational Exposure Band Rating	Occupational Exposure Band Limit
glycine-2-13C-15N, 99 atom% 13 C, 98 atom% 15 N	E	≤ 0.01 mg/m ³
L-tyrosine	E	≤ 0.01 mg/m ³
methionine-d3 (methyl-d3)	E	≤ 0.01 mg/m ³
L-aspartic acid	E	≤ 0.01 mg/m ³

Notes: Occupational exposure banding is a process of assigning chemicals into specific categories or bands based on a chemical's potency and the adverse health outcomes associated with exposure. The output of this process is an occupational exposure band (OEB), which corresponds to a range of exposure concentrations that are expected to protect worker health.

Exposure controls

Appropriate engineering controls	Enclosed local exhaust ventilation is required at points of dust, fume or vapour generation. HEPA terminated local exhaust ventilation should be considered at point of generation of dust, fumes or vapours. Barrier protection or laminar flow cabinets should be considered for laboratory scale handling. A fume hood or vented balance enclosure is recommended for weighing/ transferring quantities exceeding 500 mg.
Individual protection measures, such as personal protective equipment	
Eye and face protection	When handling very small quantities of the material eye protection may not be required. For laboratory, larger scale or bulk handling or where regular exposure in an occupational setting occurs: ► Chemical goggles. ► Face shield. Full face shield may be required for supplementary but never for primary protection of eyes.
Skin protection	See Hand protection below
Hands/feet protection	<p>The selection of suitable gloves does not only depend on the material, but also on further marks of quality which vary from manufacturer to manufacturer. Where the chemical is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.</p> <p>The exact break through time for substances has to be obtained from the manufacturer of the protective gloves and has to be observed when making a final choice.</p> <p>Personal hygiene is a key element of effective hand care.</p> <ul style="list-style-type: none"> ► Rubber gloves (nitrile or low-protein, powder-free latex, latex/ nitrile). Employees allergic to latex gloves should use nitrile gloves in preference. ► Double gloving should be considered. ► PVC gloves. <p>Experience indicates that the following polymers are suitable as glove materials for protection against undissolved, dry solids, where abrasive particles are not present.</p> <ul style="list-style-type: none"> ► polychloroprene. ► nitrile rubber.

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	▸ butyl rubber.
Body protection	See Other protection below
Other protection	<ul style="list-style-type: none"> ▸ For quantities up to 500 grams a laboratory coat may be suitable. ▸ For quantities up to 1 kilogram a disposable laboratory coat or coverall of low permeability is recommended. Coveralls should be buttoned at collar and cuffs. ▸ For quantities over 1 kilogram and manufacturing operations, wear disposable coverall of low permeability and disposable shoe covers.

Respiratory protection

Type -P Filter of sufficient capacity. (AS/NZS 1716 & 1715, EN 143:2000 & 149:2001, ANSI Z88 or national equivalent)

Required Minimum Protection Factor	Half-Face Respirator	Full-Face Respirator	Powered Air Respirator
up to 10 x ES	P1 Air-line*	-	PAPR-P1
up to 50 x ES	Air-line**	P2	PAPR-P2
up to 100 x ES	-	P3	-
		Air-line*	-
100+ x ES	-	Air-line**	PAPR-P3

* - Negative pressure demand ** - Continuous flow

A(All classes) = Organic vapours, B AUS or B1 = Acid gasses, B2 = Acid gas or hydrogen cyanide(HCN), B3 = Acid gas or hydrogen cyanide(HCN), E = Sulfur dioxide(SO₂), G = Agricultural chemicals, K = Ammonia(NH₃), Hg = Mercury, NO = Oxides of nitrogen, MB = Methyl bromide, AX = Low boiling point organic compounds(below 65 degC)

- Respirators may be necessary when engineering and administrative controls do not adequately prevent exposures.
- The decision to use respiratory protection should be based on professional judgment that takes into account toxicity information, exposure measurement data, and frequency and likelihood of the worker's exposure - ensure users are not subject to high thermal loads which may result in heat stress or distress due to personal protective equipment (powered, positive flow, full face apparatus may be an option).
- Published occupational exposure limits, where they exist, will assist in determining the adequacy of the selected respiratory protection. These may be government mandated or vendor recommended.
- Certified respirators will be useful for protecting workers from inhalation of particulates when properly selected and fit tested as part of a complete respiratory protection program.
- Where protection from nuisance levels of dusts are desired, use type N95 (US) or type P1 (EN143) dust masks. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU)
- Use approved positive flow mask if significant quantities of dust becomes airborne.
- Try to avoid creating dust conditions.

Class P2 particulate filters are used for protection against mechanically and thermally generated particulates or both.

P2 is a respiratory filter rating under various international standards, Filters at least 94% of airborne particles

Suitable for:

- Relatively small particles generated by mechanical processes eg. grinding, cutting, sanding, drilling, sawing.
- Sub-micron thermally generated particles e.g. welding fumes, fertilizer and bushfire smoke.
- Biologically active airborne particles under specified infection control applications e.g. viruses, bacteria, COVID-19, SARS

SECTION 9 Physical and chemical properties

Information on basic physical and chemical properties

Appearance	White to off-white Solid		
Physical state	Solid	Relative density (Water = 1)	Not Available
Odour	Not Available	Partition coefficient n-octanol / water	Not Available
Odour threshold	Not Available	Auto-ignition temperature (°C)	Not Available
pH (as supplied)	Not Available	Decomposition temperature (°C)	Not Available
Melting point / freezing point (°C)	Not Available	Viscosity (cSt)	Not Available
Initial boiling point and boiling range (°C)	Not Available	Molecular weight (g/mol)	Not Available
Flash point (°C)	Not Available	Taste	Not Available
Evaporation rate	Not Available	Explosive properties	Not Available
Flammability	Not Available	Oxidising properties	Not Available
Upper Explosive Limit (%)	Not Available	Surface Tension (dyn/cm or mN/m)	Not Applicable
Lower Explosive Limit (%)	Not Available	Volatile Component (%vol)	Not Available
Vapour pressure (kPa)	Not Available	Gas group	Not Available
Solubility in water	Not Available	pH as a solution (1%)	Not Available
Vapour density (Air = 1)	Not Available	VOC g/L	Not Available

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SECTION 10 Stability and reactivity

Reactivity	See section 7
Chemical stability	<ul style="list-style-type: none"> ▶ Unstable in the presence of incompatible materials. ▶ Product is considered stable. ▶ Hazardous polymerisation will not occur.
Possibility of hazardous reactions	See section 7
Conditions to avoid	See section 7
Incompatible materials	See section 7
Hazardous decomposition products	See section 5

SECTION 11 Toxicological information

Information on toxicological effects

Inhaled	The material is not thought to produce adverse health effects or irritation of the respiratory tract (as classified by EC Directives using animal models). Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable control measures be used in an occupational setting. Not normally a hazard due to non-volatile nature of product
Ingestion	The material has NOT been classified by EC Directives or other classification systems as "harmful by ingestion". This is because of the lack of corroborating animal or human evidence.
Skin Contact	This material can cause inflammation of the skin on contact in some persons. The material may accentuate any pre-existing dermatitis condition Skin contact is not thought to have harmful health effects (as classified under EC Directives); the material may still produce health damage following entry through wounds, lesions or abrasions. Open cuts, abraded or irritated skin should not be exposed to this material Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.
Eye	This material can cause eye irritation and damage in some persons.
Chronic	Repeated or long-term occupational exposure is likely to produce cumulative health effects involving organs or biochemical systems. Based on experience with animal studies, exposure to the material may result in toxic effects to the development of the foetus, at levels which do not cause significant toxic effects to the mother.

LABELED AMINO ACID STANDARDS SET A	TOXICITY	IRRITATION
	Not Available	Not Available
glycine-2-13C-15N, 99 atom% 13 C, 98 atom% 15 N	TOXICITY	IRRITATION
	Not Available	Not Available
arginine monohydrochloride	TOXICITY	IRRITATION
	Oral (Rat) LD50: 12000 mg/kg ^[2]	Eye: no adverse effect observed (not irritating) ^[1]
		Skin: no adverse effect observed (not irritating) ^[1]
L-tyrosine	TOXICITY	IRRITATION
	Oral (Rat) LD50: >618 mg/kg ^[1]	Eye: no adverse effect observed (not irritating) ^[1]
L-citrulline	TOXICITY	IRRITATION
	Not Available	Not Available
L-phenylalanine	TOXICITY	IRRITATION
	Oral (Rat) LD50: >=10000<=16000 mg/kg ^[1]	Eye: no adverse effect observed (not irritating) ^[1]
		Skin: no adverse effect observed (not irritating) ^[1]
ornithine hydrochloride	TOXICITY	IRRITATION
	Oral (Rat) LD50: 10000 mg/kg ^[2]	Skin: no adverse effect observed (not irritating) ^[1]
methionine-d3 (methyl-d3)	TOXICITY	IRRITATION
	Not Available	Not Available
L-glutamic acid	TOXICITY	IRRITATION
	dermal (rat) LD50: >2000 mg/kg ^[1]	Eye: no adverse effect observed (not irritating) ^[1]
	Oral (Rabbit) LD50: 2300 mg/kg ^[2]	Skin: no adverse effect observed (not irritating) ^[1]

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L-aspartic acid	TOXICITY	IRRITATION
	Dermal (rabbit) LD50: 5000 mg/kg ^[1]	Not Available
	Oral (Rat) LD50: 2000 mg/kg ^[1]	
L-leucine-d3	TOXICITY	IRRITATION
	Not Available	Not Available
L-valine	TOXICITY	IRRITATION
	Inhalation(Rat) LC50: >5.26 mg/L4h ^[1]	Eye: no adverse effect observed (not irritating) ^[1]
	Oral (Rat) LD50: >2000 mg/kg ^[1]	Skin: no adverse effect observed (not irritating) ^[1]
L-alanine-2,3,3,3-D4	TOXICITY	IRRITATION
	Not Available	Not Available

Legend: 1. Value obtained from Europe ECHA Registered Substances - Acute toxicity 2. Value obtained from manufacturer's SDS. Unless otherwise specified data extracted from RTECS - Register of Toxic Effect of chemical Substances

ARGININE MONOHYDROCHLORIDE	D-arginine monohydrochloride [RTECS No.: CF 1995000]
L-TYROSINE	Reproductive effector in rats. Maternal effects involving ovaries and fallopian tubes recorded. Asthma-like symptoms may continue for months or even years after exposure to the material ends. This may be due to a non-allergic condition known as reactive airways dysfunction syndrome (RADS) which can occur after exposure to high levels of highly irritating compound. Main criteria for diagnosing RADS include the absence of previous airways disease in a non-atopic individual, with sudden onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant. Other criteria for diagnosis of RADS include a reversible airflow pattern on lung function tests, moderate to severe bronchial hyperreactivity on methacholine challenge testing, and the lack of minimal lymphocytic inflammation, without eosinophilia.
L-PHENYLALANINE	Bacterial cell mutagen. Reproductive effector in monkey.
ORNITHINE HYDROCHLORIDE	for L-ornithine monohydrochloride
L-VALINE	Micro-organism cell mutagen.
LABELED AMINO ACID STANDARDS SET A & L-PHENYLALANINE	<p>Adverse effects associated with gabapentinoids, including somnolence, dizziness and ataxia, occur in healthy volunteers implying an ability to modulate transmitter release within the CNS. Furthermore, de novo sensitivity of those with chronic pain, epilepsy and anxiety disorders to gabapentinoids implicates other factors within CNS circuits that determine the additional inhibitory activity of these drugs. The comparative effects of gabapentinoids in animal models and neuropathic patients are suggestive of similar processes being involved. It is worth considering continuation of profiling and sub-grouping of patients within trials as this could lead to the identification of better predictors of efficacy.</p> <p>Side effects of treatment with mhu (mu) opioid agonists such as morphine may include nausea, vomiting, sedation, constriction of the pupils, irritability, pallor, slow heart rate, low blood pressure, and sweating. Respiratory depression, psychological dependence and other disturbing psychotic effects have been recorded. Approved mu opioid antagonists for use in the treatment of these adverse effects include naloxone and naltrexone. Naloxone, in contrast to naltrexone may be addictive.</p> <p>for delta-opioid receptor agonists:</p> <p>Activation of delta receptors produces some analgesia, although less than that of mhu-opioid agonists. Many delta agonists may also cause seizures at high doses, although not all delta agonists produce this effect.</p> <p>Evidence for whether delta agonists produce respiratory depression is mixed; high doses of the delta agonist peptide DPDPE produced respiratory depression in sheep but in tests on mice the non-peptide delta agonist SNC-80 produced respiratory depression only at the very high dose of 40 mg/kg. In contrast both the peptide delta agonist Deltorphin II and the non-peptide delta agonist (+)-BW373U86 actually stimulated respiratory function and blocked the respiratory depressant effect of the potent mhu-opioid agonist alfentanil, without affecting pain relief. It thus seems likely that while delta opioid agonists can produce respiratory depression at very high doses, at lower doses they have the opposite effect, a fact that may make mixed mu/delta agonists such as DPI-3290 potentially very useful drugs that might be much safer than the mhu agonists currently used for pain relief.</p> <p>Delta agonists may constitute a novel class of antidepressant drugs, following robust evidence of both antidepressant effects and also up-regulation of BDNF (brain-derived neurotrophic factor) production in the brain in animal models of depression.</p> <p>For G-protein inhibitors/ antagonists/ modulators.</p> <p>G protein-coupled receptors (GPCRs) are essential cell membrane signaling molecules and represent the most important class of drug targets. Some signaling pathways downstream of a GPCR may be responsible for drug adverse effects, while others mediate therapeutic efficacy. Biased ligands preferentially activate only a subset of all GPCR signaling pathways. They hold great potential to become next-generation GPCR drugs with less side effects due to their potential to exclusively activate desired signaling pathways.</p>
L-CITRULLINE & L-PHENYLALANINE & L-ASPARTIC ACID	No significant acute toxicological data identified in literature search.

Acute Toxicity	✗	Carcinogenicity	✗
Skin Irritation/Corrosion	✓	Reproductivity	✓
Serious Eye Damage/Irritation	✓	STOT - Single Exposure	✗
Respiratory or Skin sensitisation	✗	STOT - Repeated Exposure	✓
Mutagenicity	✗	Aspiration Hazard	✗

Legend: ✗ – Data either not available or does not fill the criteria for classification
 ✓ – Data available to make classification

SECTION 12 Ecological information

Toxicity

LABELED AMINO ACID STANDARDS SET A	Endpoint	Test Duration (hr)	Species	Value	Source
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	Not Available	Not Available	Not Available	Not Available	Not Available
glycine-2-13C-15N, 99 atom% 13 C, 98 atom% 15 N	Endpoint	Test Duration (hr)	Species	Value	Source
	Not Available	Not Available	Not Available	Not Available	Not Available
arginine monohydrochloride	Endpoint	Test Duration (hr)	Species	Value	Source
	LC50	96h	Fish	>1000mg/L	2
	NOEC(ECx)	24h	Crustacea	<1000mg/L	2
L-tyrosine	Endpoint	Test Duration (hr)	Species	Value	Source
	NOEC(ECx)	72h	Algae or other aquatic plants	63.2mg/l	2
	EC50	72h	Algae or other aquatic plants	>63.2mg/l	2
	EC50	48h	Crustacea	>100mg/l	2
L-citrulline	Endpoint	Test Duration (hr)	Species	Value	Source
	EC10(ECx)	48h	Algae or other aquatic plants	343-657mg/l	4
L-phenylalanine	Endpoint	Test Duration (hr)	Species	Value	Source
	NOEC(ECx)	48h	Crustacea	100mg/l	2
	EC50	72h	Algae or other aquatic plants	>100mg/l	2
	LC50	96h	Fish	324mg/l	2
	EC50	48h	Crustacea	>100mg/l	2
ornithine hydrochloride	Endpoint	Test Duration (hr)	Species	Value	Source
	EC10(ECx)	48h	Crustacea	100mg/l	2
	EC50	72h	Algae or other aquatic plants	>100mg/l	2
	EC50	48h	Crustacea	>100mg/l	2
methionine-d3 (methyl-d3)	Endpoint	Test Duration (hr)	Species	Value	Source
	Not Available	Not Available	Not Available	Not Available	Not Available
L-glutamic acid	Endpoint	Test Duration (hr)	Species	Value	Source
	NOEC(ECx)	72h	Algae or other aquatic plants	16mg/l	2
	EC50	72h	Algae or other aquatic plants	27mg/l	2
	LC50	96h	Fish	>99.47mg/l	2
	EC50	48h	Crustacea	>83.14mg/l	2
L-aspartic acid	Endpoint	Test Duration (hr)	Species	Value	Source
	NOEC(ECx)	72h	Algae or other aquatic plants	3.81mg/l	2
	EC50	72h	Algae or other aquatic plants	5.56mg/l	2
	LC50	96h	Fish	>100mg/l	2
	EC50	96h	Algae or other aquatic plants	2237mg/l	2
	EC50	48h	Crustacea	63mg/l	2
L-leucine-d3	Endpoint	Test Duration (hr)	Species	Value	Source
	Not Available	Not Available	Not Available	Not Available	Not Available
L-valine	Endpoint	Test Duration (hr)	Species	Value	Source
	EC50(ECx)	24h	Crustacea	>1000mg/L	2
	LC50	96h	Fish	>1000mg/L	2
L-alanine-2,3,3,3-D4	Endpoint	Test Duration (hr)	Species	Value	Source
	Not Available	Not Available	Not Available	Not Available	Not Available

Legend: Extracted from 1. IUCLID Toxicity Data 2. Europe ECHA Registered Substances - Ecotoxicological Information - Aquatic Toxicity 4. US EPA, Ecotox database - Aquatic Toxicity Data 5. ECETOC Aquatic Hazard Assessment Data 6. NITE (Japan) - Bioconcentration Data 7. METI (Japan) - Bioconcentration Data 8. Vendor Data

DO NOT discharge into sewer or waterways.

Persistence and degradability

Ingredient	Persistence: Water/Soil	Persistence: Air
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LABELED AMINO ACID STANDARDS SET A

Ingredient	Persistence: Water/Soil	Persistence: Air
arginine monohydrochloride	LOW	LOW
L-tyrosine	HIGH	HIGH
L-citrulline	LOW	LOW
L-phenylalanine	HIGH	HIGH
ornithine hydrochloride	LOW	LOW
methionine-d3 (methyl-d3)	LOW	LOW
L-glutamic acid	LOW	LOW
L-aspartic acid	LOW	LOW
L-leucine-d3	HIGH	HIGH
L-valine	HIGH	HIGH

Bioaccumulative potential

Ingredient	Bioaccumulation
arginine monohydrochloride	LOW (LogKOW = -4.0041)
L-tyrosine	LOW (LogKOW = -1.7628)
L-citrulline	LOW (LogKOW = -3.19)
L-phenylalanine	LOW (LogKOW = -1.2826)
ornithine hydrochloride	LOW (LogKOW = -3.4792)
methionine-d3 (methyl-d3)	LOW (LogKOW = -2.4127)
L-glutamic acid	LOW (LogKOW = -3.69)
L-aspartic acid	LOW (LogKOW = -3.89)
L-leucine-d3	LOW (LogKOW = -1.5906)
L-valine	LOW (LogKOW = -2.26)

Mobility in soil

Ingredient	Mobility
arginine monohydrochloride	LOW (KOC = 20.86)
L-tyrosine	LOW (KOC = 97.15)
L-citrulline	LOW (KOC = 10)
L-phenylalanine	LOW (KOC = 59.98)
ornithine hydrochloride	LOW (KOC = 7.029)
methionine-d3 (methyl-d3)	LOW (KOC = 9.356)
L-glutamic acid	LOW (KOC = 14.46)
L-aspartic acid	LOW (KOC = 7.842)
L-leucine-d3	LOW (KOC = 7.842)
L-valine	LOW (KOC = 4.341)

SECTION 13 Disposal considerations

Waste treatment methods

Product / Packaging disposal	<ul style="list-style-type: none"> ▶ DO NOT allow wash water from cleaning or process equipment to enter drains. ▶ It may be necessary to collect all wash water for treatment before disposal. ▶ In all cases disposal to sewer may be subject to local laws and regulations and these should be considered first. ▶ Where in doubt contact the responsible authority.
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SECTION 14 Transport information

Labels Required

Marine Pollutant	NO
HAZCHEM	Not Applicable

Land transport (ADG): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS

Air transport (ICAO-IATA / DGR): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS

Sea transport (IMDG-Code / GGVSee): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS

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

Not Applicable

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

Product name	Group
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Continued...

LABELED AMINO ACID STANDARDS SET A

Product name	Group
glycine-2-13C-15N, 99 atom% 13 C, 98 atom% 15 N	Not Available
arginine monohydrochloride	Not Available
L-tyrosine	Not Available
L-citrulline	Not Available
L-phenylalanine	Not Available
ornithine hydrochloride	Not Available
methionine-d3 (methyl-d3)	Not Available
L-glutamic acid	Not Available
L-aspartic acid	Not Available
L-leucine-d3	Not Available
L-valine	Not Available
L-alanine-2,3,3,3-D4	Not Available

Transport in bulk in accordance with the IGC Code

Product name	Ship Type
glycine-2-13C-15N, 99 atom% 13 C, 98 atom% 15 N	Not Available
arginine monohydrochloride	Not Available
L-tyrosine	Not Available
L-citrulline	Not Available
L-phenylalanine	Not Available
ornithine hydrochloride	Not Available
methionine-d3 (methyl-d3)	Not Available
L-glutamic acid	Not Available
L-aspartic acid	Not Available
L-leucine-d3	Not Available
L-valine	Not Available
L-alanine-2,3,3,3-D4	Not Available

SECTION 15 Regulatory information

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

glycine-2-13C-15N, 99 atom% 13 C, 98 atom% 15 N is found on the following regulatory lists

Not Applicable

arginine monohydrochloride is found on the following regulatory lists

Australian Inventory of Industrial Chemicals (AIIC)

L-tyrosine is found on the following regulatory lists

Australian Inventory of Industrial Chemicals (AIIC)

L-citrulline is found on the following regulatory lists

Australian Inventory of Industrial Chemicals (AIIC)

L-phenylalanine is found on the following regulatory lists

Australian Inventory of Industrial Chemicals (AIIC)

ornithine hydrochloride is found on the following regulatory lists

Australian Inventory of Industrial Chemicals (AIIC)

methionine-d3 (methyl-d3) is found on the following regulatory lists

Not Applicable

L-glutamic acid is found on the following regulatory lists

Australian Inventory of Industrial Chemicals (AIIC)

L-aspartic acid is found on the following regulatory lists

Australian Inventory of Industrial Chemicals (AIIC)

L-leucine-d3 is found on the following regulatory lists

Not Applicable

L-valine is found on the following regulatory lists

Australian Inventory of Industrial Chemicals (AIIC)

L-alanine-2,3,3,3-D4 is found on the following regulatory lists

Not Applicable

LABELED AMINO ACID STANDARDS SET A

National Inventory Status

National Inventory	Status
Australia - AIIC / Australia Non-Industrial Use	No (glycine-2-13C-15N, 99 atom% 13 C, 98 atom% 15 N; methionine-d3 (methyl-d3); L-leucine-d3; L-alanine-2,3,3,3-D4)
Canada - DSL	No (glycine-2-13C-15N, 99 atom% 13 C, 98 atom% 15 N; L-citrulline; methionine-d3 (methyl-d3); L-leucine-d3; L-alanine-2,3,3,3-D4)
Canada - NDSL	No (glycine-2-13C-15N, 99 atom% 13 C, 98 atom% 15 N; L-tyrosine; L-phenylalanine; methionine-d3 (methyl-d3); L-aspartic acid; L-leucine-d3; L-valine; L-alanine-2,3,3,3-D4)
China - IECSC	No (glycine-2-13C-15N, 99 atom% 13 C, 98 atom% 15 N; methionine-d3 (methyl-d3); L-leucine-d3; L-alanine-2,3,3,3-D4)
Europe - EINEC / ELINCS / NLP	No (glycine-2-13C-15N, 99 atom% 13 C, 98 atom% 15 N; methionine-d3 (methyl-d3); L-leucine-d3; L-alanine-2,3,3,3-D4)
Japan - ENCS	No (glycine-2-13C-15N, 99 atom% 13 C, 98 atom% 15 N; arginine monohydrochloride; ornithine hydrochloride; methionine-d3 (methyl-d3); L-leucine-d3; L-alanine-2,3,3,3-D4)
Korea - KECI	No (glycine-2-13C-15N, 99 atom% 13 C, 98 atom% 15 N; L-citrulline; methionine-d3 (methyl-d3); L-leucine-d3; L-alanine-2,3,3,3-D4)
New Zealand - NZIoC	No (glycine-2-13C-15N, 99 atom% 13 C, 98 atom% 15 N; methionine-d3 (methyl-d3); L-leucine-d3; L-alanine-2,3,3,3-D4)
Philippines - PICCS	No (glycine-2-13C-15N, 99 atom% 13 C, 98 atom% 15 N; methionine-d3 (methyl-d3); L-leucine-d3; L-alanine-2,3,3,3-D4)
USA - TSCA	No (glycine-2-13C-15N, 99 atom% 13 C, 98 atom% 15 N; methionine-d3 (methyl-d3); L-leucine-d3; L-alanine-2,3,3,3-D4)
Taiwan - TCSI	No (glycine-2-13C-15N, 99 atom% 13 C, 98 atom% 15 N; methionine-d3 (methyl-d3); L-alanine-2,3,3,3-D4)
Mexico - INSQ	No (glycine-2-13C-15N, 99 atom% 13 C, 98 atom% 15 N; L-tyrosine; L-citrulline; L-phenylalanine; ornithine hydrochloride; methionine-d3 (methyl-d3); L-leucine-d3; L-alanine-2,3,3,3-D4)
Vietnam - NCI	No (glycine-2-13C-15N, 99 atom% 13 C, 98 atom% 15 N; methionine-d3 (methyl-d3); L-leucine-d3; L-alanine-2,3,3,3-D4)
Russia - FBEPH	No (glycine-2-13C-15N, 99 atom% 13 C, 98 atom% 15 N; L-citrulline; ornithine hydrochloride; methionine-d3 (methyl-d3); L-leucine-d3; L-valine; L-alanine-2,3,3,3-D4)
Legend:	Yes = All CAS declared ingredients are on the inventory No = One or more of the CAS listed ingredients are not on the inventory. These ingredients may be exempt or will require registration.

SECTION 16 Other information

Revision Date	28/05/2023
Initial Date	03/04/2021

SDS Version Summary

Version	Date of Update	Sections Updated
2.4	28/05/2023	Identification of the substance / mixture and of the company / undertaking - Synonyms

Other information

Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.

The SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

Definitions and abbreviations

PC— TWA: Permissible Concentration-Time Weighted Average
PC— STEL: Permissible Concentration-Short Term Exposure Limit
IARC: International Agency for Research on Cancer
ACGIH: American Conference of Governmental Industrial Hygienists
STEL: Short Term Exposure Limit
TEEL: Temporary Emergency Exposure Limit.
IDLH: Immediately Dangerous to Life or Health Concentrations
ES: Exposure Standard
OSF: Odour Safety Factor
NOAEL :No Observed Adverse Effect Level
LOAEL: Lowest Observed Adverse Effect Level
TLV: Threshold Limit Value
LOD: Limit Of Detection
OTV: Odour Threshold Value
BCF: BioConcentration Factors
BEI: Biological Exposure Index
AIIC: Australian Inventory of Industrial Chemicals
DSL: Domestic Substances List
NDSL: Non-Domestic Substances List
IECSC: Inventory of Existing Chemical Substance in China
EINECS: European INventory of Existing Commercial chemical Substances
ELINCS: European List of Notified Chemical Substances
NLP: No-Longer Polymers
ENCS: Existing and New Chemical Substances Inventory
KECI: Korea Existing Chemicals Inventory
NZIoC: New Zealand Inventory of Chemicals
PICCS: Philippine Inventory of Chemicals and Chemical Substances
TSCA: Toxic Substances Control Act
TCSI: Taiwan Chemical Substance Inventory
INSQ: Inventario Nacional de Sustancias Químicas
NCI: National Chemical Inventory
FBEPH: Russian Register of Potentially Hazardous Chemical and Biological Substances

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