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SECTION 1: CHEMICAL PRODUCT & COMPANY INFORMATION

1.1. **Product name:** Puretitre natural compound library in dimethyl sulfoxide (DMSO)

Catalogue code: PT200

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

For laboratory research use only, not for human or veterinary use.

1.3. **Details of the supplier of the safety data sheet:**

Company Name: Caithness Biotechnologies Ltd, Leicester, United Kingdom. Email: contact@caithnessbiotechnologies.com

1.4. **Emergency contact:** +44 (0) 116 326 3802 Mon - Fri 9 am to 5 pm
National Poisons Information Service 0344 892 0111

SECTION 2: HAZARDS IDENTIFICATION

2.1 **Classification of the substance or mixture:**

CLP classification	- Not a hazardous substance according to Regulation (EC) No 1272/2008
Physical hazards	- Based on available data, the classification criteria are not met.
Health hazards	- Based on available data, the classification criteria are not met.
Environmental hazards	- Based on available data, the classification criteria are not met.

GHS classification	Placard	Key word	GHS hazard phrase
Flammable liquids, category 4	None	Warning	Combustible liquid
Acute toxicity, oral, category 4	Exclamation point	Warning	Harmful if swallowed
Skin corrosion / irritation, category 2	Exclamation point	Warning	Causes skin irritation
Serious eye damage / irritation, category 2A	Exclamation point	Warning	Causes serious eye irritation

2.2 **Label elements:**

Hazard statements - Combustible liquid.

GHS Hazard phrases:	H227 Combustible liquid. H302 Harmful if swallowed. H315 Causes skin irritation. H319 Causes serious eye irritation.
GHS Precaution Phrases:	P280: Wear protective clothing/gloves/eye protection/face protection. P210: Keep away from heat sparks/open flames/hot surfaces, no smoking. P264: Wash hands thoroughly after handling. P362+364 Take off contaminated clothing and wash before reuse.
GHS Response Phrases:	P302+352: IF ON SKIN. Wash with plenty of soap and water. P332+313: If skin irritation occurs, get medical advice/attention. P305+351+338: IF IN EYES. Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing. P337+313: If eye irritation persists, get medical advice/attention.
GHS Storage and Disposal Phrases:	Please refer to section 7 for storage and section 13 for disposal information.
Adverse human health effects and symptoms:	Causes skin and serious eye irritation. DMSO has the potential to carry toxic materials or materials of unknown toxicity into body. DMSO is readily absorbed through skin. Material may be irritating to the mucous membranes and upper respiratory tract. May be harmful by inhalation, ingestion, or skin absorption. May cause respiratory system irritation.
Target organs:	To the best of our knowledge, the toxicological properties have not been thoroughly investigated.
LD50 / LC50:	Eyes, reproductive system, kidneys, respiratory system, liver, skin.
Medical conditions generally aggravated by exposure:	Please refer to section 11. No data available.

2.3 **Other hazards:**

DMSO readily penetrates skin and may carry other dissolved chemicals into the body.

SECTION 3: COMPOSITION / INFORMATION ON INGREDIENTS

Component	CAS No.	EC No.	Concentration	Risk phrases	RTECS #
Dimethyl sulfoxide	67-68-5	200-664-3	>99%	R36/38	PV6210000
Natural compounds	N/A	N/A	<1%	N/A	N/A

Reach registration number: 01-2119431362-50

SECTION 4: FIRST AID MEASURES

4.1 Description of first aid measures:

General Advice	If symptoms persist, call a physician. Show this safety data sheet to the doctor in attendance.
Eye Contact	Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Obtain medical attention.
Skin Contact	Wash off immediately with plenty of water for at least 15 minutes. Get medical attention immediately if symptoms occur.
Ingestion	Do not induce vomiting. Obtain medical attention.
Inhalation	Move to fresh air. If breathing is difficult, give oxygen. Get medical attention immediately if symptoms occur.
Protection of first-aiders	No special precautions required.

4.2. Most important symptoms and effects, both acute and delayed: None reasonably foreseeable.

4.3. Indication of any immediate medical attention and special treatment needed:

Notes to Physician: Treat symptomatically.

SECTION 5: FIRE FIGHTING MEASURES

5.1. Suitable Extinguishing Media: Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide. Cool closed containers exposed to fire with water spray.

Extinguishing media which must not be used for safety reasons: No information available.

5.2. Special hazards arising from the substance or mixture: Combustible material. Containers may explode when heated. Thermal decomposition can lead to release of irritating gases and vapors.

Hazardous Combustion Products: Carbon monoxide (CO), Carbon dioxide (CO₂), Sulfur oxides, Sulfides, Formaldehyde.

5.3. Advice for firefighters: As with any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures: Use personal protective equipment. Remove all sources of ignition. Take precautionary measures against static discharges. Ensure adequate ventilation.

6.2. Environmental precautions: Should not be released into the environment. Do not flush into surface water or sanitary sewer system. See Section 12 for additional ecological information.

6.3. Methods and material for containment and cleaning up: Remove all sources of ignition. Soak up with inert absorbent material. Keep in suitable, closed containers for disposal.

6.4. Reference to other sections: Refer to protective measures listed in Sections 8 and 13.

SECTION 7: HANDLING AND STORAGE

7.1. Precautions for safe handling: Wear personal protective equipment. Ensure adequate ventilation. Keep away from open flames, hot surfaces and sources of ignition. Avoid contact with skin, eyes and clothing. Avoid ingestion and inhalation.

7.2. Conditions for safe storage, including any incompatibilities: Keep containers tightly closed in a dry, cool and well-ventilated place. Keep away from heat and sources of ignition.

7.3. Specific end use(s): Use in research laboratories.

SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1. Control parameters

Exposure limits:

Component	Germany	Austria	Denmark	Switzerland	Sweden
Dimethyl sulfoxide	TWA: 50 ppm (8 Stunden). MAK (8 Stunden). MAK (8 Stunden). MAK Höhepunkt: 100 ppm Höhepunkt: 320 mg/m ³ Haut	Haut MAK-TMW: 50 ppm 8 Stunden MAK-TMW: 160 mg/m ³ 8 Stunden	TWA: 50 ppm 8 timer TWA: 160 mg/m ³ 8 timer	Haut/Peau STEL: 100 ppm 15 Minuten STEL: 320 mg/m ³ 15 Minuten TWA: 50 ppm 8 Stunden TWA: 160 mg/m ³ 8 Stunden	STV: 150 ppm 15 minuter STV: 500 mg/m ³ 15 minuter LLV: 50 ppm 8 timmar. LLV: 150 mg/m ³ 8 timmar. Hud
Natural compounds	No information	No information	No information	No information	No information

Monitoring methods: BS EN 14042:2003 Title Identifier: Workplace atmospheres. Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents. MDHS70 General methods for sampling airborne gases and vapours.

Derived No Effect Level (DNEL): No information available.

Predicted No Effect Concentration (PNEC): No information available.

8.2. Exposure controls

Protective equipment summary - Hazard label information: Engineering controls (ventilation etc):	Compatible chemical resistant gloves. Eye wash station in work area. Lab coat. Safety glasses. Safety shower in work area. Vent hood. Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits.
Eye protection: Protective gloves:	Safety glasses. Compatible chemical resistant gloves. Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. (Refer to manufacturer/supplier).
Other protective clothing: Respiratory equipment: Work/Hygienic/Maintenance practices:	Lab coat. NIOSH approved respirator, as conditions warrant. Do not take internally. Facilities storing or utilising this material should be equipped with an eyewash facility and a safety shower.
Environmental exposure controls:	Wash thoroughly after handling. No data available.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties:

Component:	Dimethyl sulfoxide	Component:	Dimethyl sulfoxide
Appearance:	Colourless	Explosion limit (lower):	2.6 Vol%
Physical state:	Liquid	Explosion limit (upper):	42 Vol%
Odour:	Odourless	Vapour pressure:	0.55 mbar @ 20°C
pH:	No information available	Vapour density:	2.7 (air = 1.0)
Melting point:	18.4°C	Specific gravity:	1.10
Flash point:	87°C	Water solubility:	Soluble
Molecular formula:	C ₂ H ₆ O S	Autoignition temperature:	301°C
Molecular weight:	78.13	Decomposition temperature:	>190°C
Evaporation rate:	No information available	Explosive properties:	No information available.
Flammability (solid, gas):	Not applicable (liquid)	Oxidising properties:	No information available.

SECTION 10: STABILITY AND REACTIVITY

10.1. Reactivity: - No information available.

10.2. Chemical stability: - Hygroscopic.

10.3. Possibility of hazardous reactions:

Hazardous polymerisation - Hazardous polymerisation does not occur.

Hazardous reactions - Thermal decomposition can take place above 189°C.

10.4. Conditions to avoid:

Incompatible products. Excess heat. Keep away from open flames, hot surfaces and sources of ignition.

10.5. Incompatible materials: Strong oxidising agents. Strong acids. Strong bases.

10.6. Hazardous decomposition products:

Carbon monoxide (CO). Carbon dioxide (CO₂). Sulfur oxides. Sulfides. Formaldehyde.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects:

(a) acute toxicity;

Oral - Based on available data, the classification criteria are not met

Dermal - Based on available data, the classification criteria are not met

Inhalation - Based on available data, the classification criteria are not met

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
Dimethyl sulfoxide	LD50 = 14,500 mg/kg (Rat)	LD50 = 40,000 mg/kg (Rat)	No information
Natural compounds	No information	No information	No information

(b) skin corrosion/irritation; Based on available data, the classification criteria are not met

(c) serious eye damage/irritation; Based on available data, the classification criteria are not met

- (d) respiratory or skin sensitization;
 Respiratory - Based on available data, the classification criteria are not met
 Skin - Based on available data, the classification criteria are not met
- (e) germ cell mutagenicity; Based on available data, the classification criteria are not met
- (f) carcinogenicity; Based on available data, the classification criteria are not met
 To the best of our knowledge, there are no known carcinogenic chemicals in this product
- (g) reproductive toxicity; Based on available data, the classification criteria are not met
- (h) STOT-single exposure; Based on available data, the classification criteria are not met
- (i) STOT-repeated exposure; Based on available data, the classification criteria are not met
 Target Organs - No information available.
- (j) aspiration hazard; Based on available data, the classification criteria are not met
- 11.2. Symptoms / effects, both acute and delayed: No information available

SECTION 12: ECOLOGICAL INFORMATION

12.1. Toxicity:

Component	Freshwater Fish	Water Flea	Freshwater Algae	Microtox
Dimethyl sulfoxide	40 g/L LC50 96 h 33-37 g/L LC50 96 h	EC50 24h 7000 mg/L	EC50 96h 12350 - 25500 mg/L	Pseudomonas putida 16 h = 16 g/L EC50 Photobacterium phosphoreum 5 min = 77 mg/L EC50 Tetrahymena pyriformis 24 h = 32 g/L EC50
Natural compounds	No information	No information	No information	No information

12.2. Persistence and degradability biodegradation: 90% (28d)

Persistence: Soluble in water, persistence is unlikely, based on information available.

Degradation in sewage treatment plant: Contains no substances known to be hazardous to the environment or not degradable in waste water treatment plants.

12.3. Bioaccumulative potential: Bioaccumulation is unlikely

Dimethyl sulfoxide log Pow = -2.03. Bioconcentration factor (BCF): No data available.

12.4. Mobility in soil

The product will likely be highly mobile in soils and the environment due to its water solubility.

12.5. Results of PBT and vPvB assessment: No data available for assessment.

12.6. Other adverse effects:

- | | |
|---------------------------------|-------------------|
| Endocrine Disruptor Information | - No information. |
| Persistent Organic Pollutant | - No information. |
| Ozone Depletion Potential | - No information. |

SECTION 13: DISPOSAL CONSIDERATIONS

13.1. Waste Disposal Method: Dispose of product in accordance with local, state and federal regulations.

SECTION 14: TRANSPORT INFORMATION

- | | | |
|---|--|----------------------|
| 14.1. Land Transport (US DOT): | DOT Proper Shipping Name | Not dangerous goods. |
| 14.2. Land Transport (European ADR/RID): | ADR/RID Shipping Name | Not dangerous goods. |
| 14.3. Air Transport (ICAO/IATA): | ICAO/IATA Shipping Name | Not dangerous goods. |
| 14.4. Additional transport information: | Transport in accordance with local, state and federal regulations. | |
| 14.5. Environmental hazards: | No hazards identified | |
| 14.6. Special precautions for user: | No special precautions required | |
| 14.7. Bulk transport according to Annex II of MARPOL73/78 and the IBC code: | Not applicable, packaged goods. | |

SECTION 15: REGULATORY INFORMATION

15.1. European Community Hazard Symbol Codes: Xi: Irritant

15.2. European Community Risk and Safety Phrases:

R36/38	Irritating to eyes and skin.
S24/25	Avoid contact with skin and eyes.
S26	In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S36/37/39	Wear suitable protective clothing, gloves and eye/face protection.
S45	In case of accident or if you feel unwell, seek medical advice immediately (show the label whenever possible).

US EPA SARA Title III:

Component	CAS #	Sec.302 (EHS)	Sec.304 (RQ)	Sec.313 (TRI)	Sec.110
Dimethyl sulfoxide	67-68-5	No	No	No	No
Natural compounds	-	No	No	No	No

International Inventories: (X = listed)

Component	EINECS	ELINCS	NLP	TSCA	DSL	NDSL	PICCS	ENCS	IECSC	AICS	KECL
Dimethyl sulfoxide	200-664-3	-	-	X	X	-	X	X	X	X	X
Natural compounds	-	-	-	-	-	-	-	-	-	-	-

Take note of Control of Substances Hazardous to Health Regulations (COSHH) 2002 and 2005 Amendment.

Take note of Directive 94/33/EC on the protection of young people at work.

Take note of Directive 98/24/EC on the protection of the health and safety of workers from the risks related to chemical agents at work.

Regulatory information statement: This SDS was prepared in accordance with Regulation (EC) No.1272/2008 and European Directive 67/548/EEC as amended.

15.2. Chemical safety assessment: A Chemical Safety Assessment/Report (CSA/CSR) has not been conducted.

SECTION 16: OTHER INFORMATION

16.1. Abbreviations / legend:

ACGIH	American Conference of Governmental Industrial Hygienists	LC50	Lethal Concentration 50%
ADR	European Agreement Concerning the International Carriage of Dangerous Goods by Road	LD50	Lethal Dose 50%
AICS	Australian Inventory of Chemical Substances	MARPOL	International Convention for the Prevention of Pollution from Ships
ATE	Acute Toxicity Estimate	NOEC	No Observed Effect Concentration
BCF	Bioconcentration factor	NZIoC	New Zealand Inventory of Chemicals
CAS	Chemical Abstracts Service	OECD	Organisation for Economic Cooperation and Development
DNEL	Derived No Effect Level	PBT	Persistent, Bioaccumulative, Toxic
DSL/NDSL	Canadian Domestic Substances List/NonDomestic Substances List	PICCS	Philippines Inventory of Chemicals and Chemical Substances
EC50	Effective Concentration 50%	PNEC	Predicted No Effect Concentration
EINECS/ELINCS	European Inventory of Existing Commercial Chemical Substances/EU List of Notified Chemical Substances	POW	Partition coefficient Octanol:Water
ENCS	Japanese Existing and New Chemical Substances	RPE	Respiratory Protective Equipment
IARC	International Agency for Research on Cancer	TSCA	United States Toxic Substances Control Act Section 8(b) Inventory
ICAO/IATA	International Civil Aviation Organization/International Air Transport Association	TWA	Time Weighted Average
IECSC	Chinese Inventory of Existing Chemical Substances	VOC	Volatile Organic Compounds
IMO/IMDG	International Maritime Organization/International Maritime Dangerous Goods Code	vPvB	very Persistent, very Bioaccumulative
KECL	Korean Existing and Evaluated Chemical Substances	WEL	Workplace Exposure Limit

16.2. Key literature references and sources for data: Supplier's SDS, Chemadvisor - LOLI, Merck index, RTECS.

16.3. SDS creation date: 31/01/2019; SDS revision date: 31/01/2021

16.4. Disclaimer:

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

End of Safety Data Sheet