


Safety Data Sheet:

Nodularin

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1. Identification of the Substance and the Manufacturer

1.1. Product identifiers

Product name	Nodularin	Formula	C ₄₁ H ₆₀ N ₈ O ₁₀
Product Code	NOD	RTECS	GU2294250
CAS#	118399-22-7	Molecular weight	824.96 g/mol
ECHA#	621-437-9	Substance? Mixture?	Substance
HSDB#	7749		
Synonyms	<ul style="list-style-type: none"> ▪ Nodularin ▪ Nodularin-R ▪ Cyclo((Z)-2,3-didehydro-N-methyl-2-aminobutanoyl-erythro-3-methyl-D-beta-aspartyl-L-arginyl-(2S,3S,4E,6E,8S,9S)-4,5,6,7-tetradehydro-9-methoxy-2,6,8-trimethyl-10-phenyl-3-aminodecanoyl-D-gamma-glutamyl) ▪ Cyclo(L-arginyl-(2S,3S,4E,6E,8S,9S)-3-amino-9-methoxy-2,6,8-trimethyl-10-phenyl-4,6-decadienoyl-D-gamma-glutamyl-(2Z)-2-(methylamino)-2-butenoyl-(3S)-3-methyl-D-beta-aspartyl) 		
Source	Nodularia spumigena (a blue-green alga)	Version Date	27 June, 2023

1.2. Intended uses of the Substance and uses advised against

1.2.1. Intended use: Reference material. Research and development. Laboratory reagent. Manufacturing of substances. To be used by professionals only	1.2.2. Uses advised against: Not a drug, Not a food additive Not to be used in humans or animals.
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1.3. Contacts

1.3.1. Details of the supplier of the SDS

FERMENTEK ltd 4 Yatziv street, POB 47120 Jerusalem 97800, Israel	Tel: +972 2 5853953 Fax: +972 2 5853943 eMail: Fermentek@Fermentek.com Safety@Fermentek.com Website: Fermentek.com
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This company is the manufacturer of the product and the supplier of the safety data sheet

1.3.2. Emergency Telephone number

**For chemical emergency spill, leak, fire, exposure, or accident calls CHEMTREC day or night:
 Within USA and Canada: 1-800-424-9300. Outside USA and Canada: +1 703-527-3887**

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2. Hazards' identification.

2.1. Classification of the Substance.

2.1.1. GHS Classification: According to EU Reg. 1272/2008 and US OSHA 1910.1200)

Accute toxicity: Oral	Category 2	H300	Fatal if swallowed
Accute toxicity: On skin	Category 2	H310	Fatal in contact with skin
Accute toxicity: Inhal	Category 2	H330	Fatal if inhaled
Skin Irrit.	Category 2	H315	Causes skin irritation
Skin Sens	Category 1	H317	May cause an allergic skin reaction
Eye Irrit.	Category 2	H319	Causes serious eye irritation
STOT/SE Lungs	Category 3	H335	May cause respiratory irritation

2.2. GHS Label elements, including precautionary statements

2.2.1. Pictogram: {  } Signal word: {Danger}

2.2.2. Hazard Statements

H301+H310+H330	Fatal if swallowed, inhaled or in contact with skin
H315	Causes skin irritation
H317	May cause an allergic skin reaction
H319	Causes serious eye irritation
H335	May cause respiratory irritation

2.2.3. GHS Precautionary Statements

P203	Obtain, read and follow all safety instructions before use.
P261	Avoid breathing dust or mist.
P264	Wash {hands} thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P272	Contaminated work clothing should not be allowed out of the workplace.
P280	Wear protective gloves/protective clothing/eye protection/face protection/hearing protection

2.2.4. GHS Response Phrases:

P301+P316	IF SWALLOWED: Get emergency medical help immediately.
P330	Rinse mouth
P302+P352+P316	IF ON SKIN: wash with plenty of water
P332+P316,	If skin irritation occurs: Get medical help immediately.
P362+P364	Take off contaminated clothing and wash it before reuse.
P305+P351+P338 P316	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do - continue rinsing Get emergency medical help immediately
P319	Get medical help if you feel unwell.

3. Composition/information on ingredients

Substance	
Substance Name:	Nodularin
Concentration	<=100%
CAS Registry#:	118399-22-7
EC#:	621-437-9


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Molecular Formula:	<i>C₄₁H₆₀N₈O₁₀</i>
Molecular Weight:	824.96 g/mol
Classification	Ac Tox. 2; Ac Tox. 1; Ac Tox. 2; Skin Irrit. 2; Eye Irrit. 2; Skin Sens. 1; STOT SE 3; H300, H330, H310, H315, H319, H317, H335
Mixture?	Substance

4. First Aid Measures.

4.1. Description of First Aid Measures.

General advice:	First-aiders need to protect themselves. If medical attention is required, show this safety data sheet to the doctor in attendance.
Eye contact:	Rinse out with plenty of water. Remove contact lenses.
Skin Contact:	In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/shower.
Ingestion:	If swallowed: give water to drink (two glasses at most). Seek medical advice immediately.
Inhalation:	If inhaled, move the person into fresh air.

4.2. Most important symptoms and effects, both acute and delayed

General symptoms	None known
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4.3. Indication of any immediate medical attention and special treatment needed

Note to physicians	No data available
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5. Fire-fighting measures.

5.1. Extinguishing media.

Suitable extinguishing media	Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.
Unsuitable extinguishing media	None known

5.2. Other information

Hazardous combustion products	Carbon oxides, Nitrogen oxides, Sulfur oxides, Sulfur dihydrogen, Formula <i>C₄₁H₆₀N₈O₁₀</i>
Advice for firefighters	Wear self-contained breathing apparatus for fire fighting if necessary. Wear protective suit.

6. Accidental release measures

6.1. Personal precautions, protective equipment, and emergency procedures

Personal precautions	Use personal protective equipment as required. Keep people away from and upwind of spill/leak.
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6.2. Environmental precautions

Environmental precautions	Prevent further leakage or spillage if safe to do so. Prevent product from entering drains.
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6.3. Methods and material for containment and cleaning up

Methods for containment:	Prevent further leakage or spillage if safe to do so. Cover the powder spill with a plastic sheet or tarp to minimize spreading. Dike far ahead of liquid spill for later disposal.
Methods for cleaning up:	Clean-up should be dealt with only by qualified personnel familiar with the specific substance. Cover liquid spill with sand, earth or other non-combustible absorbent material (e.g., sand, earth, diatomaceous earth, and vermiculite). Cover the powder spill with a plastic sheet or tarp to minimize spreading. Sweep up and shovel into suitable containers for disposal.



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7. Handling and storage

7.1. Precautions for safe handling

Advice on safe handling:	Avoid contact with skin, eyes or clothing. Use personal protective equipment as required. Wash contaminated clothing before reuse. Do not breathe dust/fume/gas/mist/vapors/spray. Do not eat, drink or smoke when using this product.
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7.2. Conditions for safe storage, including any incompatibilities

Storage Conditions:	Keep container tightly closed in a dry and well-ventilated place. Keep out of the reach of children. Store at -20 °C.
Suitable packaging	Must only be kept in original packaging.
Incompatible materials:	None known based on information available.

8. Exposure Controls/Personal Protection

8.1. Control parameters

Control parameters	Components with workplace control parameters
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8.2. Exposure controls

Appropriate engineering controls	Showers, Eyewash stations, Ventilation systems Avoid contact with skin, eyes, and clothing. Wash hands before breaks and immediately after handling the product. Use fume-hood for routine work.
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8.3. Personal protective equipment

[PPE=Personal Protection Equipment]	
PPE: Respiratory protection	Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).
PPE: Hand Protection:	Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal techniques to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices, and wash and dry hands
PPE: Eye Protection:	Use a face shield and safety glasses. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166 (EU)
PPE: Skin and Body Protection:	Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands. The selected protective gloves have to satisfy the specifications of Regulation (EU) 2016/425 and the standard EN 374 derived from it.

9. Physical and chemical properties

9.1. Physical/chemical properties

Physical State at room temperature	Solid
Appearance	Powder, White
No further safety relevant data are available	

10. Stability and reactivity

Reactivity:	No information available.
Chemical stability:	Stable under normal conditions.


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Conditions to avoid	Heat, flames and sparks. Sunlight.
Incompatible materials	Strong reducers and oxidizers
Possibility of Hazardous Reactions	None under normal processing
Hazardous combustion products	See section 5

11. Toxicological information

11.1. Information on toxicological effects

11.1.1. Acute Toxicity

Acute toxicity:	Oral, Rat, LD50 estimate= 6 mg/kg, estimates are based on LD50/interperitoneal. Oral, Mouse, LD50 estimate= 5 mg/kg Estimates are based on LD50/interperitoneal. No other acute toxicity information is available.
Skin corrosion/irritation:	No data available
Serious eye damage/eye irritation:	No data available
Respiratory or skin sensitization/corrosion:	No data available

11.1.2. Chronic toxicity

Chronic toxicity	No data available
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11.1.3. CRM (Carcinogene, Mutagene, Reproductive hazards)

Germ cell mutagenicity:	Mutagenicity in- vitro/human liver and in-vivo / rodent/liver has been reported
Carcinogenicity:	Group 3: Not classifiable as to its carcinogenicity to humans
Reproductive toxicity / Teratogenicity:	Male repro-toxicity in rodents has been reported.

11.2. Additional information

RTECS number	GU2294250
General symptoms	No data available

12. Ecological Information

Eco-Toxicity	No data available
Other adverse effects	No data available

13. Disposal Considerations

13.1. Waste treatment methods

Waste Disposal	Dispose of in accordance with local regulations
Contaminated packaging	Dispose of as unused product

14. Transport information

14.1. UN Number, Proper Shipping Name, Transport Hazard Class, packing group

	US DOT	ADR/RID	IATA	IMDG
UN Number	UN 3642	UN 3642	UN 3642	UN 3642
UN proper shipping name	Toxins, Extracted from Living Sources, Solid, N.O.S. (Nodularin)	Toxins, Extracted from Living Sources, Solid, N.O.S. (Nodularin)	Toxins, Extracted from Living Sources, Solid, N.O.S. (Nodularin)	Toxins, Extracted from Living Sources, Solid, N.O.S. (Nodularin)
Transport Hazard Class & Packing Group	Class 6.1 (Poison) Packing group: I	Class 6.1 (Poison) Packing group: I	Class 6.1 (Poison) Packing group: I	Class 6.1 (Poison) Packing group: I

Excepted quantities (EQ)	Code: E5 Maximum net quantity per inner packaging: 1 g Maximum net quantity per outer packaging: 300 g
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De Minimis Quantities exemption

When sold in quantities of less than or equal to 1 mL, or 1 g, with an Excepted Quantity Code of E1, E2, E4, or E5, this item meets the De Minimis Quantities exemption, per IATA 2.6.10. Therefore, packaging does not have to be labeled as Dangerous Goods/Excepted Quantity.

15. Regulatory information

15.1. Safety, health, and environmental regulations/legislation

USA EPA / TSCA	This product is not listed on the USA EPA TSCA
USA SARA	Section 355 (extremely hazardous substances): Substance is not listed. · Section 313 (Specific toxic chemical listings): Substance is not listed. · TSCA (Toxic Substances Control Act): Substance is not listed. · Hazardous Air Pollutants Substance is not listed. ·
Proposition 65	Chemicals known to cause cancer: Substance is not listed. · Chemicals known to cause reproductive toxicity for females: Substance is not listed. · Chemicals known to cause reproductive toxicity for males: Substance is not listed. · Chemicals known to cause developmental toxicity: Substance is not listed. ·
EU ECHA Status	This product is registered with the EU ECHA, Number 621-437-9 REACH: Neither Registered nor PreRegistered. ANNEX III (criteria for 1 - 10 tonne registered substances): Not Listed

16. Other information

16.1. Department issuing this SDS

Quality systems and regulatory affairs

16.2. General 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 here is designed only as 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.

16.3. The users'/employers' responsibility:

A risk assessment should be performed by the employer/user prior to the use of this product.

All recommendations included in this document, are advisory in nature.

The type of protective equipment must be selected based on the amount and concentration of all dangerous materials being used in the workplace.

16.4. No-Copyright statement

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16.5. Abbreviations and acronyms:

Acute Tox.:	Acute toxicity
CAS:	Chemical Abstracts Service
DOT:	US Department of Transportation
ECHA	European Chemicals Agency
EINECS:	European Inventory of Existing Commercial Chemical Substances
Eye Dam.:	Serious eye damage/eye irritation
HSDB	Hazardous Substances Data Bank


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<i>HMIS:</i>	<i>Hazardous Materials Identification System (USA)</i>
<i>IATA:</i>	<i>International Air Transport Association</i>
<i>IMDG:</i>	<i>International Maritime Code for Dangerous Goods</i>
<i>LC50:</i>	<i>Lethal concentration, Median</i>
<i>LD50:</i>	<i>Lethal dose, Median</i>
<i>NDG</i>	<i>Not dangerous goods (for transport)</i>
<i>NFPA:</i>	<i>National Fire Protection Association USA</i>
<i>NIOSH:</i>	<i>National Institute for Occupational Safety</i>
<i>OSHA:</i>	<i>Occupational Safety & Health</i>
<i>PBT:</i>	<i>Persistent, Bioaccumulative, and Toxic</i>
<i>PEL:</i>	<i>Permissible Exposure Limit</i>
<i>REL:</i>	<i>Recommended Exposure Limit</i>
<i>Repr.:</i>	<i>Reproductive toxicity</i>
<i>RTECS:</i>	<i>Registry of Toxic Effects of Chemical Substances</i>
<i>Skin Irrit:</i>	<i>Skin corrosion/irritation</i>
<i>STOT/SE</i>	<i>Specific target organ toxicity/Single exposure</i>
<i>STOT/RE</i>	<i>Specific target organ toxicity/Repeated exposure</i>
<i>T3DB</i>	<i>Toxin and Toxin Target Database</i>
<i>TDL0</i>	<i>Toxic dose, least published</i>

16.6. End of SDS