

**Safety Data Sheet**

according to Regulation (EC) No 1907/2006

**Verrucarin A**

Revision date: 31.07.2019

Product code: LS-1186

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**SECTION 1: Identification of the substance/mixture and of the company/undertaking****1.1. Product identifier**

Verrucarin A

**Further trade names**Muconomycin A  
NSC 126728  
NSC 200736  
Glutinosin-I  
Myrothecin-I

(4S,5R,10E,12Z,16R,16aS,17S,18R,19aR,23aR)

-4,5,6,7,16,16a,19a,22-Octahydro-4-hydroxy-5,16a,21-trimethylspiro[16,18-methano-1H,3H,23H-  
[1,6,12]trioxacyclooctadecino[3,4-d][1]benzopyran-17(18H),2'-oxirane]-3,9,14-trione

(1'R,4'E,6'E,16a'R,23a'R)

-13'-hydroxy-12',19',23a'-trimethyl-1',12',13',18',20a',23a'-hexahydro-10'H,16'H,17'H,22'H-spiro[oxirane-2,23'-  
[1,22]methano[1,6,12]trioxacyclooctadecino[3,4-d]chromene]-3',8',14'(11'H)-trione

CAS No: 3148-09-2

EC No: 636-535-7

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

for professional use only. Laboratory chemical

**Uses advised against**

Do not use for private purposes (household).

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

Company name:	Iris Biotech GmbH	
Street:	Adalbert-Zoellner-Straße 1	
Place:	D-95615 Marktredwitz, Germany	
Post-office box:	568	
	D-95605 Marktredwitz, Germany	
Telephone:	+49 9231 97121 0	Telefax: +49 9231 97121 99
e-mail:	info@iris-biotech.de	
Contact person:	Compliance Department	Telephone: +49 9231 97121 0
e-mail:	sds@iris-biotech.de	
Internet:	www.iris-biotech.de	
Responsible Department:	Only available during office hours.	

**1.4. Emergency telephone number:** +49 (0)89 19240 (POISON CENTER Munich: 24 h)**Further Information**

Emergency telephone: 24h

A registration number is not available for this substance as the substance or its use are exempted from registration according to Article 2 REACH Regulation (EC) No 1907/2006, the annual tonnage does not require a registration or the registration is envisaged for a later registration deadline.

**SECTION 2: Hazards identification****2.1. Classification of the substance or mixture****Regulation (EC) No. 1272/2008**

Hazard categories:

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Acute toxicity: Acute Tox. 1  
Acute toxicity: Acute Tox. 2  
Acute toxicity: Acute Tox. 2  
Hazard Statements:  
Fatal if inhaled.  
Fatal if swallowed.  
Fatal in contact with skin.

**2.2. Label elements****Regulation (EC) No. 1272/2008****Signal word:** Danger**Pictograms:****Hazard statements**

H300+H310+H330 Fatal if swallowed, in contact with skin or if inhaled.

**Precautionary statements**

P260 Do not breathe dust/fume/gas/mist/vapours/spray.  
P262 Do not get in eyes, on skin, or on clothing.  
P264 Wash hands thoroughly after handling.  
P280 Wear protective gloves/protective clothing/eye protection/face protection/hearing protection.  
P284 Wear respiratory protection.  
P301+P310 IF SWALLOWED: Immediately call a POISON CENTER/doctor.  
P302+P352 IF ON SKIN: Wash with plenty of Water.  
P310 Immediately call a POISON CENTER/doctor.  
P361+P364 Take off immediately all contaminated clothing and wash it before reuse.  
P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.  
P310 Immediately call a POISON CENTER/doctor.  
P403+P233 Store in a well-ventilated place. Keep container tightly closed.  
P405 Store locked up.  
P501 Dispose of contents/container to an approved disposal site.

**Additional advice on labelling**

Warning - substance not yet tested completely.

**2.3. Other hazards**

No information available.

**SECTION 3: Composition/information on ingredients****3.1. Substances****Chemical characterization**

(1'R,4'E,6'E,16a'R,23a'R)  
-13'-hydroxy-12',19',23a'-trimethyl-1',12',13',18',20a',23a'-hexahydro-10'H,16'H,17'H,22'H-spiro[oxirane-2,23'-  
[1,22]methano[1,6,12]trioxacyclooctadecino[3,4-d]chromene]-3',8',14'(11'H)-trione

Sum formula: C<sub>27</sub>H<sub>34</sub>O<sub>9</sub>

Molecular weight: 502,57 g/mol

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**Hazardous components**

CAS No	Chemical name			Quantity
	EC No	Index No	REACH No	
	GHS Classification			
3148-09-2	Verrucarin A			<=100 %
	636-535-7			
	Acute Tox. 1, Acute Tox. 2, Acute Tox. 2; H330 H310 H300			

Full text of H and EUH statements: see section 16.

**Specific Conc. Limits, M-factors and ATE**

CAS No	EC No	Chemical name	Quantity
	Specific Conc. Limits, M-factors and ATE		
3148-09-2	636-535-7	Verrucarin A	<=100 %
	inhalation: ATE = 0,05 mg/l (vapours); inhalation: ATE = 0,005 mg/l (dusts or mists); dermal: ATE = 50 mg/kg; oral: ATE = 5 mg/kg		

**SECTION 4: First aid measures**
**4.1. Description of first aid measures**
**General information**

First aider: Pay attention to self-protection! Remove affected person from the danger area and lay down. In case of accident or unwellness, seek medical advice immediately (show directions for use or safety data sheet if possible).

**After inhalation**

Provide fresh air. No mouth-to-mouth or mouth-to-nose resuscitation. Use Ambu bag or ventilator. Call a physician immediately. Remove casualty to fresh air and keep warm and at rest. In case of irregular breathing or respiratory arrest provide artificial respiration.

In all cases of doubt, or when symptoms persist, seek medical advice.

**After contact with skin**

After contact with skin, wash immediately with plenty of water and soap. Take off immediately all contaminated clothing and wash it before reuse. Call a physician immediately.

In all cases of doubt, or when symptoms persist, seek medical advice.

**After contact with eyes**

After eye contact: Rinse immediately carefully and thoroughly with eye-bath or water. Consult an ophthalmologist.

**After ingestion**

Rinse mouth immediately and drink plenty of water. Induce vomiting when the affected person is not unconscious. Call a physician immediately. Rinse mouth thoroughly with water. Never give anything by mouth to an unconscious person or a person with cramps.

In all cases of doubt, or when symptoms persist, seek medical advice.

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

No information available.

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

Treat symptomatically.

**SECTION 5: Firefighting measures**
**5.1. Extinguishing media**
**Suitable extinguishing media**

Co-ordinate fire-fighting measures to the fire surroundings. Water spray. alcohol resistant foam. Dry extinguishing powder. Carbon dioxide (CO<sub>2</sub>). Sand.

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**Unsuitable extinguishing media**

High power water jet.

**5.2. Special hazards arising from the substance or mixture**

Non-flammable. Thermal decomposition can lead to the escape of irritating gases and vapours.

In case of fire may be liberated: Carbon dioxide (CO<sub>2</sub>). Carbon monoxide (CO). Nitrogen oxides (NO<sub>x</sub>).**5.3. Advice for firefighters**

Wear a self-contained breathing apparatus and chemical protective clothing. Full protection suit.

**Additional information**

Suppress gases/vapours/mists with water spray jet. Collect contaminated fire extinguishing water separately.

Do not allow entering drains or surface water. Usual measures for fire prevention.

**SECTION 6: Accidental release measures****6.1. Personal precautions, protective equipment and emergency procedures****General advice**

Avoid dust formation. Do not breathe dust. Avoid contact with skin, eyes and clothes. Use personal protection equipment. Provide adequate ventilation. Avoid breathing dust/fume/gas/mist/vapours/spray.

Avoid contact with skin, eyes and clothes.

Wear personal protection equipment.

In case of fire: Evacuate area.

**6.2. Environmental precautions**

Do not allow to enter into surface water or drains. Do not allow to enter into soil/subsoil.

In case of gas escape or of entry into waterways, soil or drains, inform the responsible authorities.

**6.3. Methods and material for containment and cleaning up****Other information**

Take up mechanically. Treat the recovered material as prescribed in the section on waste disposal. Absorb with liquid-binding material (sand, diatomaceous earth, acid- or universal binding agents). Collect in closed and suitable containers for disposal. Clean floors and contaminated objects with: Water, if necessary together with cleansing agents. Avoid dust formation.

**6.4. Reference to other sections**

Safe handling: see section 7

Personal protection equipment: see section 8

Disposal: see section 13

**SECTION 7: Handling and storage****7.1. Precautions for safe handling****Advice on safe handling**

If handled uncovered, arrangements with local exhaust ventilation have to be used. Avoid dust formation. Do not breathe dust. Provide adequate ventilation.

Avoid contact with skin, eyes and clothes.

**Advice on protection against fire and explosion**

Provide adequate ventilation. Keep away from sources of ignition - No smoking.

Usual measures for fire prevention.

**Advice on general occupational hygiene**

Remove contaminated, saturated clothing immediately. Draw up and observe skin protection programme.

Wash hands and face before breaks and after work and take a shower if necessary. When using do not eat, drink, smoke, sniff. Avoid contact with skin, eyes and clothes. Provide adequate ventilation.

**Further information on handling**

Never use pressure to empty container. When using do not smoke. Restrict access to stockrooms. Containers which are opened carefully and kept upright to prevent leakage.

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**7.2. Conditions for safe storage, including any incompatibilities****Requirements for storage rooms and vessels**

Keep container tightly closed. Keep locked up. Store in a place accessible by authorized persons only.  
Provide adequate ventilation as well as local exhaust at critical locations. Keep container tightly closed in a cool, well-ventilated place.  
Handle and store contents under inert gas. Protect from moisture.  
storage temperature: -20 °C

**Hints on joint storage**

No special measures are necessary.

**Further information on storage conditions**

In tightly closed containers in a cool, dry place.

**7.3. Specific end use(s)**

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated.

**SECTION 8: Exposure controls/personal protection****8.1. Control parameters****Additional advice on limit values**

The receiver of our product is singularly responsible for adhering to existing laws and regulations.

**8.2. Exposure controls****Appropriate engineering controls**

If handled uncovered, arrangements with local exhaust ventilation have to be used. Do not breathe dust. The receiver of our product is singularly responsible for adhering to existing laws and regulations.

**Individual protection measures, such as personal protective equipment****Eye/face protection**

Wear eye/face protection.

**Hand protection**

When handling with chemical substances, protective gloves must be worn with the CE-label including the four control digits. The quality of the protective gloves resistant to chemicals must be chosen as a function of the specific working place concentration and quantity of hazardous substances. For special purposes, it is recommended to check the resistance to chemicals of the protective gloves mentioned above together with the supplier of these gloves. Wear suitable gloves.

**Skin protection**

Wear suitable protective clothing.

**Respiratory protection**

In case of inadequate ventilation wear respiratory protection. If technical exhaust or ventilation measures are not possible or insufficient, respiratory protection must be worn.

**Environmental exposure controls**

Discharge into the environment must be avoided.

**SECTION 9: Physical and chemical properties****9.1. Information on basic physical and chemical properties**

Physical state: solid  
Colour: white/ whitish

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Odour: No data available

**Changes in the physical state**

Melting point/freezing point: not determined

Boiling point or initial boiling point and boiling range: not determined

Sublimation point: not determined

Softening point: not determined

Flash point: No data available

**Flammability**

Solid/liquid: not determined

Gas: not applicable

**Explosive properties**

The product is not: Explosive.

Lower explosion limits: not determined

Upper explosion limits: not determined

Auto-ignition temperature: not determined

**Self-ignition temperature**

Solid: not determined

Gas: not applicable

Decomposition temperature: not determined

pH-Value: not determined

Water solubility: No data available

**Solubility in other solvents**

Soluble in: Ethanol. Methanol. Dichloromethane (DCM). Dimethylsulfoxide (DMSO)

Partition coefficient n-octanol/water: not determined

Vapour pressure: not determined

Vapour pressure: not determined

Density: not determined

Bulk density: No data available

Relative vapour density: not determined

**9.2. Other information****Information with regard to physical hazard classes**

Sustaining combustion: No data available

Oxidizing properties

No data available

**Other safety characteristics**

Solvent content: No data available

Solid content: not determined

Evaporation rate: not determined

**Further Information****SECTION 10: Stability and reactivity****10.1. Reactivity**

No data available

**10.2. Chemical stability**

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Stable under recommended storage conditions.

**10.3. Possibility of hazardous reactions**

No data available

**10.4. Conditions to avoid**

 Protect from moisture.  
 Keep away from heat.

**10.5. Incompatible materials**

Store away from: Oxidizing agents. Alkali (lye), concentrated. Strong acid.

**10.6. Hazardous decomposition products**

 Thermal decomposition can lead to the escape of irritating gases and vapours.  
 In case of fire may be liberated: Carbon dioxide (CO<sub>2</sub>). Carbon monoxide (CO). Nitrogen oxides (NO<sub>x</sub>).

**Further information**

In case of fire: See chapter 5.

**SECTION 11: Toxicological information**
**11.1. Information on hazard classes as defined in Regulation (EC) No 1272/2008**
**Toxicokinetics, metabolism and distribution**

No data available

**Acute toxicity**

 Fatal if inhaled.  
 Fatal if swallowed.  
 Fatal in contact with skin.  
 LD50 intravenous - Rat - 0,87 mg/kg  
 LD50 subcutaneous - Mouse - 3,9 mg/kg

CAS No	Chemical name				
	Exposure route	Dose	Species	Source	Method
3148-09-2	Verrucarin A				
	oral	ATE 5 mg/kg			
	dermal	ATE 50 mg/kg			
	inhalation vapour	ATE 0,05 mg/l			
	inhalation aerosol	ATE 0,005 mg/l			

**Irritation and corrosivity**

 Based on available data, the classification criteria are not met.  
 Skin - guinea pig. Result: Mild skin irritation

**Sensitising effects**

Based on available data, the classification criteria are not met.

**Carcinogenic/mutagenic/toxic effects for reproduction**

 Based on available data, the classification criteria are not met.  
 Germ cell mutagenicity: mouse - lymphocyte - DNA inhibition

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

**STOT-single exposure**

Based on available data, the classification criteria are not met.

**STOT-repeated exposure**

Based on available data, the classification criteria are not met.

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**Aspiration hazard**

Based on available data, the classification criteria are not met.

**Specific effects in experiment on an animal**

No data available

**Additional information on tests**

Special hazards arising from the substance or mixture. Classification according to Regulation (EC) No 1272/2008 [CLP]: health hazard properties.

**Practical experience**

No data available

**Further information**

RTECS: WH1314900

Necrosis, Ulceration. Symptoms may be delayed.

Caution! To the best of our knowledge the toxicological properties of this material have not been thoroughly investigated.

**SECTION 12: Ecological information****12.1. Toxicity**

No data available

**12.2. Persistence and degradability**

No data available

**12.3. Bioaccumulative potential**

No data available

**12.4. Mobility in soil**

No data available

**12.5. Results of PBT and vPvB assessment**

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted.

**12.7. Other adverse effects**

Warning - substance not yet tested completely.

**Further information**

Do not allow to enter into surface water or drains. Do not allow to enter into soil/subsoil.

**SECTION 13: Disposal considerations****13.1. Waste treatment methods****Disposal recommendations**

Do not allow to enter into surface water or drains. Do not allow to enter into soil/subsoil. Dispose of waste according to applicable legislation.

Consult the appropriate local waste disposal expert about waste disposal.

Offer surplus and non-recyclable solutions to a licensed disposal company. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

**Contaminated packaging**

Hazardous waste according to Directive 2008/98/EC (waste framework directive). Handle contaminated packages in the same way as the substance itself.

**SECTION 14: Transport information****Land transport (ADR/RID)****14.1. UN number or ID number:**

UN 3462



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**14.2. UN proper shipping name:** TOXINS, EXTRACTED FROM LIVING SOURCES, SOLID, N.O.S.  
(Verrucarin A)

**14.3. Transport hazard class(es):** 6.1

**14.4. Packing group:** I

Hazard label: 6.1



Classification code: T2

Special Provisions: 210 274

Limited quantity: 0

Excepted quantity: E5

Transport category: 1

Hazard No: 66

Tunnel restriction code: C/E

**Inland waterways transport (ADN)**

**14.1. UN number or ID number:** UN 3462

**14.2. UN proper shipping name:** TOXINS, EXTRACTED FROM LIVING SOURCES, SOLID, N.O.S.  
(Verrucarin A)

**14.3. Transport hazard class(es):** 6.1

**14.4. Packing group:** I

Hazard label: 6.1



Classification code: T2

Special Provisions: 210 274 802

Limited quantity: 0

Excepted quantity: E5

**Marine transport (IMDG)**

**14.1. UN number or ID number:** UN 3462

**14.2. UN proper shipping name:** TOXINS, EXTRACTED FROM LIVING SOURCES, SOLID, N.O.S.  
(Verrucarin A)

**14.3. Transport hazard class(es):** 6.1

**14.4. Packing group:** I

Hazard label: 6.1



Special Provisions: 210, 274

Limited quantity: 0

Excepted quantity: E5

EmS: F-A, S-A

**Air transport (ICAO-TI/IATA-DGR)**

**14.1. UN number or ID number:** UN 3462

**14.2. UN proper shipping name:** TOXINS, EXTRACTED FROM LIVING SOURCES, SOLID, N.O.S.  
(Verrucarin A)

**14.3. Transport hazard class(es):** 6.1

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**14.4. Packing group:**

I

Hazard label:

6.1



Special Provisions:

A3 A43

Limited quantity Passenger:

Forbidden

Passenger LQ:

Forbidden

Excepted quantity:

E5

IATA-packing instructions - Passenger:

666

IATA-max. quantity - Passenger:

5 kg

IATA-packing instructions - Cargo:

673

IATA-max. quantity - Cargo:

50 kg

**14.5. Environmental hazards**

ENVIRONMENTALLY HAZARDOUS:

No

**14.6. Special precautions for user**

Warning: Acute Toxicity.

**14.7. Maritime transport in bulk according to IMO instruments**

not applicable

**SECTION 15: Regulatory information****15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture****EU regulatory information**Information according to 2012/18/EU  
(SEVESO III):

H1 ACUTE TOXIC

**Additional information**

Safety Data Sheet according to Regulation (EC) No. 1907/2006 (REACH)

**National regulatory information**

Employment restrictions:

Observe restrictions to employment for juveniles according to the 'juvenile work protection guideline' (94/33/EC). Observe employment restrictions under the Maternity Protection Directive (92/85/EEC) for expectant or nursing mothers.

Water hazard class (D):

3 - highly hazardous to water

Skin resorption/Sensitization:

Permeates easily through outer skin and causes poisoning.

**15.2. Chemical safety assessment**

For this substance a chemical safety assessment has not been carried out.

**SECTION 16: Other information****Abbreviations and acronyms**ADR: Accord européen sur le transport des marchandises dangereuses par Route  
(European Agreement concerning the International Carriage of Dangerous Goods by Road)

IMDG: International Maritime Code for Dangerous Goods

IATA: International Air Transport Association

GHS: Globally Harmonized System of Classification and Labelling of Chemicals

EINECS: European Inventory of Existing Commercial Chemical Substances

ELINCS: European List of Notified Chemical Substances

CAS: Chemical Abstracts Service

LC50: Lethal concentration, 50%

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LD50: Lethal dose, 50%  
CLP: Classification, labelling and Packaging  
REACH: Registration, Evaluation and Authorization of Chemicals  
GHS: Globally Harmonised System of Classification, Labelling and Packaging of Chemicals  
UN: United Nations  
DNEL: Derived No Effect Level  
DMEL: Derived Minimal Effect Level  
PNEC: Predicted No Effect Concentration  
ATE: Acute toxicity estimate  
LL50: Lethal loading, 50%  
EL50: Effect loading, 50%  
EC50: Effective Concentration 50%  
ErC50: Effective Concentration 50%, growth rate  
NOEC: No Observed Effect Concentration  
BCF: Bio-concentration factor  
PBT: persistent, bioaccumulative, toxic  
vPvB: very persistent, very bioaccumulative  
RID: Regulations concerning the international carriage of dangerous goods by rail  
ADN: European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways (Accord européen relatif au transport international des marchandises dangereuses par voies de navigation intérieures)  
EmS: Emergency Schedules  
MFAG: Medical First Aid Guide  
ICAO: International Civil Aviation Organization  
MARPOL: International Convention for the Prevention of Marine Pollution from Ships  
IBC: Intermediate Bulk Container  
SVHC: Substance of Very High Concern  
For abbreviations and acronyms, see table at <http://abbrev.esdscom.eu>

**Relevant H and EUH statements (number and full text)**

H300	Fatal if swallowed.
H300+H310+H330	Fatal if swallowed, in contact with skin or if inhaled.
H310	Fatal in contact with skin.
H330	Fatal if inhaled.

**Further Information**

The information is based on the present level of our knowledge. It does not, however, give assurance of product properties and establishes no contract legal rights. The receiver of our product is singularly responsible for adhering to existing laws and regulations.