

Safety data sheet

Safe Work Australia - Code of Practice



Putrescin ≥99 %, for biochemistry

article number: **8379**
Version: **GHS 1.0 en**

date of compilation: 2019-09-11

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

1.1 Product identifier

Identification of the substance	Putrescin
Article number	8379
Registration number (REACH)	It is not required to list the identified uses because the substance is not subject to registration according to REACH (< 1 t/a)
EC number	203-782-3
CAS number	110-60-1

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

Identified uses:	laboratory chemical laboratory and analytical use
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1.3 Details of the supplier of the safety data sheet

Carl Roth GmbH + Co KG
Schoemperlenstr. 3-5
D-76185 Karlsruhe
Germany

Telephone: +49 (0) 721 - 56 06 0

Telefax: +49 (0) 721 - 56 06 149

e-mail: sicherheit@carlroth.de

Website: www.carlroth.de

Competent person responsible for the safety data sheet : Department Health, Safety and Environment

e-mail (competent person) : sicherheit@carlroth.de

1.4 Emergency telephone number

Name	Street	Postal code/city	Telephone	Website
NSW Poisons Information Centre Childrens Hospital	Hawkesbury Road	2145 Westmead, NSW	131126	

Emergency information service

Poison Centre Munich: +49/(0)89 19240

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification acc. to GHS

Classification acc. to GHS			
Section	Hazard class	Hazard class and category	Hazard statement
2.6	flammable liquid	(Flam. Liq. 3)	H226
2.16	substance or mixture corrosive to metals	(Met. Corr. 1)	H290

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Classification acc. to GHS			
Section	Hazard class	Hazard class and category	Hazard statement
3.10	acute toxicity (oral)	(Acute Tox. 4)	H302
3.2	skin corrosion/irritation	(Skin Corr. 1B)	H314

2.2 Label elements

Labelling GHS

Signal word

Danger

Pictograms

GHS02, GHS05,
GHS07



Hazard statements

H226 Flammable liquid and vapour
H290 May be corrosive to metals
H302 Harmful if swallowed
H314 Causes severe skin burns and eye damage

Precautionary statements

Precautionary statements - prevention

P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
P260 Do not breathe dusts or mists.
P280 Wear protective gloves/protective clothing/eye protection/face protection.

Precautionary statements - response

P303+P361+P353 IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P370+P378 In case of fire: Use sand, carbon dioxide or powder extinguisher for extinction.

Precautionary statements - storage

P403+P235 Store in a well-ventilated place. Keep cool.

Labelling of packages where the contents do not exceed 125 ml

Signal word: **Danger**

Symbol(s)



H314 Causes severe skin burns and eye damage.
P260 Do not breathe dusts or mists.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P303+P361+P353 IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
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2.3 Other hazards

There is no additional information.

SECTION 3: Composition/information on ingredients

3.1 Substances

Name of substance	1,4-Diaminobutane
EC number	203-782-3
CAS number	110-60-1
Molecular formula	C ₄ H ₁₂ N ₂
Molar mass	88.15 g/mol

SECTION 4: First aid measures

4.1 Description of first aid measures



General notes

Take off immediately all contaminated clothing. Self-protection of the first aider.

Following inhalation

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

Following skin contact

After contact with skin, wash immediately with plenty of water. Immediate medical treatment required because corrosive injuries that are not treated are hard to cure.

Following eye contact

In case of contact with eyes flush immediately with plenty of flowing water for 10 to 15 minutes holding eyelids apart and consult an ophthalmologist. Protect uninjured eye.

Following ingestion

Rinse mouth immediately and drink plenty of water. Rinse mouth with water (only if the person is conscious). If swallowed danger of perforation of the esophagus and the stomach (strong corrosive effects). Call a physician immediately.

4.2 Most important symptoms and effects, both acute and delayed

Corrosion, Risk of blindness, Nausea, Vomiting, Gastric perforation, Cough, Dyspnoea

4.3 Indication of any immediate medical attention and special treatment needed

none

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SECTION 5: Firefighting measures

5.1 Extinguishing media



Suitable extinguishing media

Co-ordinate fire-fighting measures to the fire surroundings
water spray, foam, dry extinguishing powder, carbon dioxide (CO₂)

Unsuitable extinguishing media

water jet

5.2 Special hazards arising from the substance or mixture

Combustible. If heated: Vapours are heavier than air, spread along floors and form explosive mixtures with air.

Hazardous combustion products

In case of fire may be liberated: ammonia (NH₃), nitrogen oxides (NO_x), carbon monoxide (CO), carbon dioxide (CO₂)

5.3 Advice for firefighters

Fight fire with normal precautions from a reasonable distance. Wear self-contained breathing apparatus. Wear full chemical protective clothing.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures



For non-emergency personnel

Do not breathe dust. Use personal protective equipment as required. Avoid contact with skin, eyes and clothes. Do not breathe dust. Do not breathe vapour/spray. Avoidance of ignition sources.

6.2 Environmental precautions

Keep away from drains, surface and ground water. Explosive properties.

6.3 Methods and material for containment and cleaning up

Advice on how to contain a spill

Covering of drains.

Advice on how to clean up a spill

Take up mechanically. Control of dust.

Other information relating to spills and releases

Place in appropriate containers for disposal. Ventilate affected area.

6.4 Reference to other sections

Hazardous combustion products: see section 5. Personal protective equipment: see section 8. Incompatible materials: see section 10. Disposal considerations: see section 13.

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SECTION 7: Handling and storage

7.1 Precautions for safe handling

Provision of sufficient ventilation. Use extractor hood (laboratory). Handle and open container with care. Clear contaminated areas thoroughly. Avoid exposure. Avoid dust formation. Avoid: Aerosol or mist formation.

- **Measures to prevent fire as well as aerosol and dust generation**



Keep away from sources of ignition - No smoking.

Take precautionary measures against static discharge.

Advice on general occupational hygiene

Wash hands before breaks and after work. Keep away from food, drink and animal feedingstuffs. When using do not smoke.

7.2 Conditions for safe storage, including any incompatibilities

Store in a well-ventilated place. Keep container tightly closed. Store in a dry place.

Incompatible substances or mixtures

Observe hints for combined storage.

Consideration of other advice

- **Ventilation requirements**

Use local and general ventilation.

- **Specific designs for storage rooms or vessels**

Recommended storage temperature: 15 – 25 °C.

7.3 Specific end use(s)

No information available.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

National limit values

Occupational exposure limit values (Workplace Exposure Limits)

Data are not available.

Relevant DNELs/DMELs/PNECs and other threshold levels

- **human health values**

Endpoint	Threshold level	Protection goal, route of exposure	Used in	Exposure time
DNEL	7.3 mg/m ³	human, inhalatory	worker (industry)	chronic - systemic effects
DNEL	7.3 mg/m ³	human, inhalatory	worker (industry)	acute - systemic effects
DNEL	7.3 mg/m ³	human, inhalatory	worker (industry)	chronic - local effects
DNEL	7.3 mg/m ³	human, inhalatory	worker (industry)	acute - local effects

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• environmental values

Endpoint	Threshold level	Environmental compartment	Exposure time
PNEC	0.73 mg/l	freshwater	short-term (single instance)
PNEC	0.073 mg/l	marine water	short-term (single instance)
PNEC	3.25 mg/l	sewage treatment plant (STP)	short-term (single instance)
PNEC	0.648 mg/kg	freshwater sediment	short-term (single instance)
PNEC	0.148 mg/kg	soil	short-term (single instance)

8.2 Exposure controls

Individual protection measures (personal protective equipment)

Eye/face protection



Use safety goggle with side protection. Wear face protection.

Skin protection



• hand protection

Wear suitable gloves. Chemical protection gloves are suitable, which are tested according to EN 374. Check leak-tightness/impermeability prior to use. 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. The times are approximate values from measurements at 22 ° C and permanent contact. Increased temperatures due to heated substances, body heat etc. and a reduction of the effective layer thickness by stretching can lead to a considerable reduction of the breakthrough time. If in doubt, contact manufacturer. At an approx. 1.5 times larger / smaller layer thickness, the respective breakthrough time is doubled / halved. The data apply only to the pure substance. When transferred to substance mixtures, they may only be considered as a guide.

• type of material

Butyl caoutchouc (butyl rubber)

• material thickness

0,7mm

• breakthrough times of the glove material

>480 minutes (permeation: level 6)

• other protection measures

Take recovery periods for skin regeneration. Preventive skin protection (barrier creams/ointments) is recommended.

Respiratory protection



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Respiratory protection necessary at: Dust formation, Aerosol or mist formation. Particulate filter device (EN 143). P2 (filters at least 94 % of airborne particles, colour code: White). Type: K-P2 (combined filters against ammonia, organic ammonia derivatives and particles, colour code: Green/White). Type: ABEK-P2 (combined filters against gases, vapours and particles, colour code: Brown/Grey/Yellow/Green/White).

Environmental exposure controls

Keep away from drains, surface and ground water.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance

Physical state	solid (powder, crystalline)
Colour	colourless
Odour	pungent like: amine
Odour threshold	No data available

Other physical and chemical parameters

pH (value)	This information is not available.
Melting point/freezing point	28 °C
Initial boiling point and boiling range	158 – 159 °C at 1,013 hPa
Flash point	45 °C at 1,013 hPa
Evaporation rate	no data available
Flammability (solid, gas)	These information are not available

Explosive limits

• lower explosion limit (LEL)	0.7 vol%
• upper explosion limit (UEL)	11.2 vol%
Explosion limits of dust clouds	these information are not available
Vapour pressure	436 Pa at 25 °C
Density	0.877 g/cm ³ at 25 °C
Vapour density	This information is not available.
Relative density	Information on this property is not available.

Solubility(ies)

Water solubility	40 g/l at 20 °C
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Partition coefficient

n-octanol/water (log KOW)	-0.84 (25 °C) (ECHA)
Auto-ignition temperature	420 °C - ECHA
Decomposition temperature	no data available
Viscosity	not relevant (solid matter)
• kinematic viscosity	2.184 mm ² /s

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• dynamic viscosity	1.915 mPa s at 25 °C
Explosive properties	Shall not be classified as explosive
Oxidising properties	none

9.2 Other information

Surface tension	0.033 N/m (40 °C)
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SECTION 10: Stability and reactivity

10.1 Reactivity

Risk of ignition. Substance or mixture corrosive to metals. In case of warming: Vapours can form explosive mixtures with air.

10.2 Chemical stability

Moisture-sensitive.

10.3 Possibility of hazardous reactions

Violent reaction with: Aldehydes, Ketone, Nitrate, Phenols, Acid chlorides, inorganic, Acids, Strong oxidiser

10.4 Conditions to avoid

Protect from moisture. Keep away from heat.

10.5 Incompatible materials

different metals

10.6 Hazardous decomposition products

Hazardous combustion products: see section 5.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Exposure route	Endpoint	Value	Species	Source
oral	LD50	740 mg/kg	rat	ECHA

Skin corrosion/irritation

Causes severe burns.

Serious eye damage/eye irritation

Causes serious eye damage.

Respiratory or skin sensitisation

Shall not be classified as a respiratory or skin sensitiser.

Summary of evaluation of the CMR properties

Shall not be classified as germ cell mutagenic, carcinogenic nor as a reproductive toxicant

• Specific target organ toxicity - single exposure

Shall not be classified as a specific target organ toxicant (single exposure).

• Specific target organ toxicity - repeated exposure

Shall not be classified as a specific target organ toxicant (repeated exposure).

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Aspiration hazard

Shall not be classified as presenting an aspiration hazard.

Symptoms related to the physical, chemical and toxicological characteristics

- **If swallowed**

If swallowed danger of perforation of the esophagus and the stomach (strong corrosive effects)

- **If in eyes**

causes burns, Causes serious eye damage, risk of blindness

- **If inhaled**

cough, Dyspnoea

- **If on skin**

causes severe burns, causes poorly healing wounds

Other information

None

SECTION 12: Ecological information

12.1 Toxicity

acc. to 1272/2008/EC: Shall not be classified as hazardous to the aquatic environment.

Aquatic toxicity (acute)

Endpoint	Value	Species	Source	Exposure time
LC50	730 mg/l	fish	ECHA	96 h

Aquatic toxicity (chronic)

Endpoint	Value	Species	Source	Exposure time
NOEC	>10 mg/l	fish	ECHA	28 d

12.2 Process of degradability

The substance is readily biodegradable.

Theoretical Oxygen Demand with nitrification: 2.768 mg/mg

Theoretical Oxygen Demand: 1.996 mg/mg

Theoretical Carbon Dioxide: 1.997 mg/mg

Process	Degradation rate	Time
carbon dioxide generation	≥89 %	28 d

12.3 Bioaccumulative potential

Does not significantly accumulate in organisms.

n-octanol/water (log KOW)

-0.84 (25 °C)

12.4 Mobility in soil

Data are not available.

12.5 Results of PBT and vPvB assessment

Data are not available.

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12.6 Other adverse effects

Data are not available.

SECTION 13: Disposal considerations

13.1 Waste treatment methods



This material and its container must be disposed of as hazardous waste. Dispose of contents/container in accordance with local/regional/national/international regulations.

Sewage disposal-relevant information

Do not empty into drains.

Waste treatment of containers/packagings

It is a dangerous waste; only packagings which are approved (e.g. acc. to ADR) may be used.

Sewage disposal-relevant information

Do not empty into drains.

Waste treatment of containers/packagings

It is a dangerous waste; only packagings which are approved (e.g. acc. to ADR) may be used.


13.2 Relevant provisions relating to waste

The allocation of waste identity numbers/waste descriptions must be carried out according to the EEC, specific to the industry and process.

13.3 Remarks

Waste shall be separated into the categories that can be handled separately by the local or national waste management facilities. Please consider the relevant national or regional provisions.

SECTION 14: Transport information

14.1	UN number	3286
14.2	UN proper shipping name	FLAMMABLE LIQUID, TOXIC, CORROSIVE, N.O.S.
	Hazardous ingredients	Putrescin
14.3	Transport hazard class(es)	
	Class	3 (flammable liquids)
14.4	Packing group	II (substance presenting medium danger)
14.5	Environmental hazards	none (non-environmentally hazardous acc. to the dangerous goods regulations)
14.6	Special precautions for user	Provisions for dangerous goods (ADR) should be complied within the premises.

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

The cargo is not intended to be carried in bulk.

14.8 Information for each of the UN Model Regulations

• Transport of dangerous goods by road, rail and inland waterway (ADR/RID/ADN)

UN number	3286
Proper shipping name	FLAMMABLE LIQUID, TOXIC, CORROSIVE, N.O.S.
Particulars in the transport document	UN3286, FLAMMABLE LIQUID, TOXIC, CORROSIVE, N.O.S., (Putrescin), 3 (6.1+8), II, (D/E)
Class	3
Classification code	FTC
Packing group	II
Danger label(s)	3+6.1+8



Special provisions (SP)	274, 802(ADN)
Excepted quantities (EQ)	E2
Limited quantities (LQ)	1 L
Transport category (TC)	2
Tunnel restriction code (TRC)	D/E
Hazard identification No	368
Emergency Action Code	3WE

• International Maritime Dangerous Goods Code (IMDG)

UN number	3286
Proper shipping name	FLAMMABLE LIQUID, TOXIC, CORROSIVE, N.O.S.
Particulars in the shipper's declaration	UN3286, FLAMMABLE LIQUID, TOXIC, CORROSIVE, N.O.S., (Putrescin), 3 (6.1+8), II, 45°C c.c.
Class	3
Subsidiary risk(s)	6.1 8
Marine pollutant	-
Packing group	II
Danger label(s)	3+6.1+8



Special provisions (SP)	274
Excepted quantities (EQ)	E2


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Limited quantities (LQ)	1 L
EmS	F-E, S-C
Stowage category	B
• International Civil Aviation Organization (ICAO-IATA/DGR)	
UN number	3286
Proper shipping name	Flammable liquid, toxic, corrosive, n.o.s.
Particulars in the shipper's declaration	UN3286, Flammable liquid, toxic, corrosive, n.o.s., (Putrescin), 3 (6.1+8), II
Class	3
Subsidiary risk(s)	6.1 + 8
Packing group	II
Danger label(s)	3+6.1+8
	
Excepted quantities (EQ)	E2
Limited quantities (LQ)	0,5 L

SECTION 15: Regulatory information

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

National inventories

Substance is listed in the following national inventories:

Country	National inventories	Status
AU	AICS	substance is listed
CA	NDSL	substance is listed
CN	IECSC	substance is listed
EU	ECSI	substance is listed
EU	REACH Reg.	substance is listed
JP	CSCL-ENCs	substance is listed
KR	KECI	substance is listed
MX	INSQ	substance is listed
NZ	NZIoC	substance is listed
PH	PICCS	substance is listed
TW	TCSI	substance is listed
US	TSCA	substance is listed

Legend

AICS	Australian Inventory of Chemical Substances
CSCL-ENCs	List of Existing and New Chemical Substances (CSCL-ENCs)
ECSI	EC Substance Inventory (EINECS, ELINCS, NLP)
IECSC	Inventory of Existing Chemical Substances Produced or Imported in China

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Legend

INSQ	National Inventory of Chemical Substances
KECI	Korea Existing Chemicals Inventory
NDSL	Non-domestic Substances List (NDSL)
NZIoC	New Zealand Inventory of Chemicals
PICCS	Philippine Inventory of Chemicals and Chemical Substances
REACH Reg.	REACH registered substances
TCSI	Taiwan Chemical Substance Inventory
TSCA	Toxic Substance Control Act

15.2 Chemical Safety Assessment

No Chemical Safety Assessment has been carried out for this substance.

SECTION 16: Other information

Abbreviations and acronyms

Abbr.	Descriptions of used abbreviations
ADN	Accord européen relatif au transport international des marchandises dangereuses par voies de navigation intérieures (European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways)
ADR	Accord européen relatif au transport international des marchandises dangereuses par route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
CAS	Chemical Abstracts Service (service that maintains the most comprehensive list of chemical substances)
CMR	Carcinogenic, Mutagenic or toxic for Reproduction
DGR	Dangerous Goods Regulations (see IATA/DGR)
DMEL	Derived Minimal Effect Level
DNEL	Derived No-Effect Level
EINECS	European Inventory of Existing Commercial Chemical Substances
ELINCS	European List of Notified Chemical Substances
EmS	Emergency Schedule
GHS	"Globally Harmonized System of Classification and Labelling of Chemicals" developed by the United Nations
IATA	International Air Transport Association
IATA/DGR	Dangerous Goods Regulations (DGR) for the air transport (IATA)
ICAO	International Civil Aviation Organization
IMDG	International Maritime Dangerous Goods Code
LC50	Lethal Concentration 50%: the LC50 corresponds to the concentration of a tested substance causing 50 % lethality during a specified time interval
LD50	Lethal Dose 50 %: the LD50 corresponds to the dose of a tested substance causing 50 % lethality during a specified time interval
MARPOL	International Convention for the Prevention of Pollution from Ships (abbr. of "Marine Pollutant")
NLP	No-Longer Polymer
NOEC	No Observed Effect Concentration
PBT	Persistent, Bioaccumulative and Toxic
PNEC	Predicted No-Effect Concentration
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals
RID	Règlement concernant le transport International ferroviaire des marchandises Dangereuses (Regulations concerning the International carriage of Dangerous goods by Rail)
vPvB	very Persistent and very Bioaccumulative

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Key literature references and sources for data

- UN Recommendations on the Transport of Dangerous Good
- Dangerous Goods Regulations (DGR) for the air transport (IATA)
- International Maritime Dangerous Goods Code (IMDG)

List of relevant phrases (code and full text as stated in chapter 2 and 3)

Code	Text
H226	flammable liquid and vapour
H290	may be corrosive to metals
H302	harmful if swallowed
H314	causes severe skin burns and eye damage

Disclaimer

The above information describes exclusively the safety requirements of the product and is based on our present-day knowledge. The information is intended to give you advice about the safe handling of the product named in this safety data sheet, for storage, processing, transport and disposal. The information cannot be transferred to other products. In the case of mixing the product with other products or in the case of processing, the information on this safety data sheet is not necessarily valid for the new made-up material.