

Safety Data Sheet

Ouabain octahydrate (in DMSO)

Cat#: orb1745280

Creation Date: November 26, 2024

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1. IDENTIFICATION

1.1 GHS Product identifier

Product name: Ouabain octahydrate (in DMSO)

Catalog No.: orb1745280

1.2 Recommended use of the chemical and restrictions on use

Identified uses: no data available

2. HAZARD IDENTIFICATION

2.1 Classification of the substance or mixture

Acute toxicity - Category 3, Oral

Acute toxicity - Category 3, Inhalation

Specific target organ toxicity – repeated exposure, Category 2

2.2 GHS Label elements, including precautionary statements

Pictogram(s):



Signal word: Danger

Hazard statement(s): H301 Toxic if swallowed

H331 Toxic if inhaled

H373 May cause damage to organs through prolonged or repeated exposure

Precautionary statement(s):

P264 Wash ... thoroughly after handling.

P270 Do not eat, drink or smoke when using this product.

P261 Avoid breathing dust/fume/gas/mist/vapours/spray.

Prevention:

P271 Use only outdoors or in a well-ventilated area.

P260 Do not breathe dust/fume/gas/mist/vapours/spray.

Response:	P301+P316 IF SWALLOWED: Get emergency medical help immediately.
	P321 Specific treatment (see ... on this label).
	P330 Rinse mouth.
	P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
	P316 Get emergency medical help immediately.
Storage:	P319 Get medical help if you feel unwell.
	P405 Store locked up.
	P403+P233 Store in a well-ventilated place. Keep container tightly closed.
Disposal:	P501 Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

2.3 Other hazards which do not result in classification

no data available

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Chemical name	Common names and synonyms	CAS number	EC number
Ouabain octahydrate	-	11018-89-6	-
DMSO	-	67-68-5	200-664-3

4. FIRST-AID MEASURES

4.1 Description of necessary first-aid measures

General advice

no data available

If inhaled

Move the victim into fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration and consult a doctor immediately. Do not use mouth to mouth resuscitation if the victim ingested or inhaled the chemical.

Following skin contact

Take off contaminated clothing immediately. Wash off with soap and plenty of water. Consult a doctor.

Following eye contact

Rinse with pure water for at least 15 minutes. Consult a doctor.

Following ingestion

Rinse mouth with water. Do not induce vomiting. Never give anything by mouth to an unconscious person. Call a doctor or Poison Control Center immediately.

4.2 Most important symptoms/effects, acute and delayed

In case of accidental oral ingestion, specific measures should be taken to induce emesis. Additional measures which may be considered are gastric lavage, activated charcoal and forced diuresis.

4.3 Indication of immediate medical attention and special treatment needed, if necessary

Slight eye irritation. (USCG, 1999)

5. FIRE-FIGHTING MEASURES

5.1 Extinguishing media

For small (incipient) fires, use media such as "alcohol" foam, dry chemical, or carbon dioxide. For large fires, apply water from as far as possible. Use very large quantities (flooding) of water applied as a mist or spray; solid streams of water may be ineffective. Cool all affected containers with flooding quantities of water.

5.2 Specific hazards arising from the chemical

Special Hazards of Combustion Products: Sulfur dioxide, formaldehyde, and methyl mercaptan can form (USCG, 1999)

5.3 Special protective actions for fire-fighters

Wear self-contained breathing apparatus for firefighting if necessary. Use water spray, foam, powder, carbon dioxide. In case of fire: keep drums, etc., cool by spraying with water.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Avoid dust formation. Avoid breathing mist, gas or vapours. Avoid contacting with skin and eye. Use personal protective equipment. Wear chemical impermeable gloves. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak.

6.2 Environmental precautions

Personal protection: chemical protection suit and filter respirator for organic gases and vapours adapted to the airborne concentration of the substance. Ventilation. Collect leaking and spilled liquid in sealable containers as far as possible. Absorb remaining liquid in sand or inert absorbent. Then store and dispose of according to local regulations.

6.3 Methods and materials for containment and cleaning up

Collect and arrange disposal. Keep the chemical in suitable and closed containers for disposal. Remove all sources of ignition. Use spark-proof tools and explosion-proof equipment. Adhered or collected material should be promptly disposed of, in accordance with appropriate laws and regulations.

Accidental Release Measures. Personal precautions, protective equipment and emergency procedures: Avoid breathing vapours, mist or gas. Remove all sources of ignition. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.; Environmental precautions: Prevent further leakage or spillage if safe to do so. Do not let products enter drains.; Methods and

materials for containment and cleaning up: Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet brushing and place in container for disposal according to local regulations. Keep in suitable, closed containers for disposal.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Handling in a well-ventilated place. Wear suitable protective clothing. Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Use non-sparking tools. Prevent fire caused by electrostatic discharge steam.

NO open flames. Above 87°C use a closed system, ventilation and explosion-proof electrical equipment. Handling in a well-ventilated place. Wear suitable protective clothing. Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Use non-sparking tools. Prevent fire caused by electrostatic discharge steam.

7.2 Conditions for safe storage, including any incompatibilities

Store the container tightly closed in a dry, cool and well-ventilated place. Store apart from foodstuff containers or incompatible materials.

Separated from strong oxidants. Cool. Keep in the dark. Keep in a well-ventilated room. Store away from oxidizing agents, heat, and ignition sources.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Occupational Exposure limit values

MAK: 160 mg/m³, 50 ppm; peak limitation category: I(2); skin absorption (H); pregnancy risk group: B

Biological limit values

no data available

8.2 Appropriate engineering controls

Ensure adequate ventilation. Handle in accordance with good industrial hygiene and safety practice. Set up emergency exits and the risk-elimination area.

8.3 Individual protection measures, such as personal protective equipment (PPE)

Eye/face protection

Wear tightly fitting safety goggles with side-shields conforming to EN 166(EU) or NIOSH (US).

Skin protection

Wear fire/flammable resistant and impervious clothing. Handle with gloves. Gloves must be inspected prior to use. Wash and dry hands. The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.

Respiratory protection

If the exposure limits are exceeded, irritation or other symptoms are experienced, use a full-face respirator. Use ventilation, local exhaust or breathing protection.

Thermal hazards

no data available

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state	Liquid
Color	no data available
Odour	DMSO: Slightly sulfurous odor
Melting/freezing point	Ouabain octahydrate: 260°C; DMSO: 18.5 °C.
Boiling point or initial boiling point and boiling range	Ouabain octahydrate: 838.2°C at 760 mmHg; DMSO: 189 °C. Atm. press.: 1 013 hPa.
Flammability	DMSO: Combustible. Gives off irritating or toxic fumes (or gases) in a fire.
Lower and upper explosion limit/flammability limit	DMSO: Lower flammable limit: 2.6% by volume; Upper flammable limit: 42% by volume
Flash point	Ouabain octahydrate: 272.9°C; DMSO: 87 °C. Atm. press.: 1 013 hPa.
Auto-ignition temperature	DMSO: 300 - 302 °C. Atm. press.: 1 013 hPa.
Decomposition temperature	no data available
pH	no data available
Kinematic viscosity	DMSO: dynamic viscosity (in mPa s) = 2.14. Temperature: 20°C.
Solubility	Ouabain octahydrate (solid): DMSO: 68.61 50 mg/mL (68.61 mM), H ₂ O: 2.85 2.08 mg/mL (2.85 mM), Sonication is recommended.
N-octanol-water partition coefficient	DMSO: log Pow = -1.35. Temperature: 20 °C.
Vapour pressure	DMSO: 0.417 mm Hg. Temperature: 20 °C.
Density and/ or relative density	Ouabain octahydrate: 1.51 g/cm ³ ; DMSO: 1.1 g/cm ³ . Temperature: 20 °C.; 1.09 g/cm ³ . Temperature: 30 °C.; 1.08 g/cm ³ . Temperature: 40 °C.
Relative vapour density	DMSO: 2.7 (vs air)
Particle characteristics	no data available

10. STABILITY AND REACTIVITY

10.1 Reactivity

Decomposes on heating and on burning. This produces toxic fumes including sulfur oxides. Reacts violently with strong oxidants such as perchlorates.

10.2 Chemical stability

no data available.

10.3 Possibility of hazardous reactions

Combustible when exposed to heat or flame. The vapour is heavier than air and may travel along the ground; distant ignition possible.

DMSO decomposes violently on contact with many acyl halides and related compounds such as acetyl chloride, benzenesulfonyl chloride, benzoyl chloride, cyanuric chloride, phosphorus trichloride, phosphorus oxychloride, and thionyl chloride [Chem. Eng. News 35(9):87 (1957)].

10.4 Conditions to avoid

no data available.

10.5 Incompatible materials

DMSO can react with oxidizing materials.

10.6 Hazardous decomposition products

When heated to decomposition it emits toxic fumes of /sulfur oxides/.

11. TOXICOLOGICAL INFORMATION

Acute toxicity

DMSO

Oral: LD50 - rat (male/female) - 28 300 mg/kg bw.

Remarks: Lethal? doses? caused? ataxia,? myasthenia,? decreased motor? activity,? and? bradypnea.

Inhalation: LC0 - rat (male/female) - > 5.33 mg/L air.

Dermal: LD50 - rat (male/female) - ca. 40 000 mg/kg bw.

Skin corrosion/irritation

no data available

Serious eye damage/irritation

no data available

Respiratory or skin sensitization

no data available

Germ cell mutagenicity

no data available

Carcinogenicity

no data available

Reproductive toxicity

no data available

STOT-single exposure

The substance is irritating to the eyes and skin. Exposure to high concentrations could cause lowering of consciousness. May accelerate skin absorption of other materials. See Notes.

STOT-repeated exposure

Repeated or prolonged contact with skin may cause dermatitis. The substance may have effects on the liver and blood. This may result in impaired functions and lesions of blood cells.

Aspiration hazard

No indication can be given about the rate at which a harmful concentration of this substance in the air is reached on evaporation at 20°C.

12. ECOLOGICAL INFORMATION

12.1 Toxicity

DMSO

Toxicity to fish: LC50 - Danio rerio (previous name: Brachydanio rerio) - > 25 g/L - 96 h.

Toxicity to daphnia and other aquatic invertebrates: EC50 - Daphnia magna - 24.6 g/L - 48 h.

Toxicity to algae: EC50 - Pseudokirchneriella subcapitata (previous names: Raphidocelis subcapitata, Selenastrum capricornutum) - 17g/L - 72 h.

Toxicity to microorganisms: EC50 - activated sludge, domestic - 10 - 100 mg/L - 30 min.

12.2 Persistence and degradability

DMSO

AEROBIC: Dimethyl sulfoxide, present at 100 mg/L, reached 3.1% of its theoretical BOD in 2 weeks using an activated sludge in°Culum at 30 mg/L in the Japanese MITI test(1). Little degradation of dimethyl sulfoxide (<20%) was noted in a screening test using an activated sludge in°Culum(2). Using the OECD 301E method, 99% degradation was observed (3). Using the OECD 303A method (domestic sewage simulation), 90% degradation of dimethyl sulfoxide was observed at a concentration of 65 mg/L over a 32-day incubation period (3,4). One ready biodegradation test performed following the norm AFNOR NFT 90-312 concluded that dimethyl sulfoxide is readily biodegradable (4). Dimethyl sulfoxide, at a 500 mg/L concentration, was entirely biodegraded within about 37 hours with aerobic settling sludge obtained from the activated sludge process at an opto-electronic plant, under optimized pH/temperature conditions (4). The available biodegradation screening tests have conflicting results (3), but based on available data and weight-of-evidence approach, dimethyl sulfoxide is expected to be inherently biodegradable(4).

12.3 Bioaccumulative potential

no data available

12.4 Mobility in soil

DMSO

Using a structure estimation method based on molecular connectivity indices (1), the K^{oc} of dimethyl sulfoxide can be estimated to be 2(SRC). According to a classification scheme (2), this estimated K^{oc} value suggests that dimethyl sulfoxide is expected to have very high mobility in soil.

12.5 Other adverse effects

no data available

13. DISPOSAL CONSIDERATIONS

13.1 Disposal methods

Product

The material can be disposed of by removal to a licensed chemical destruction plant or by controlled incineration with flue gas scrubbing. Do not contaminate water, foodstuffs, feed or seed by storage or disposal. Do not discharge to sewer systems.

Contaminated packaging

Containers can be triply rinsed (or equivalent) and offered for recycling or reconditioning. Alternatively, the packaging can be punctured to make it unusable for other purposes and then be disposed of in a sanitary landfill. Controlled incineration with flue gas scrubbing is possible for combustible packaging materials.

14. TRANSPORT INFORMATION

14.1 UN Number

no data available

14.2 UN Proper Shipping Name

no data available

14.3 Transport hazard class(es)

no data available

14.4 Packing group, if applicable

no data available

14.5 Environmental hazards

no data available

14.6 Special precautions for user

no data available

14.7 Transport in bulk according to IMO instruments

no data available

15 REGULATORY INFORMATION

15.1 Safety, health and environmental regulations specific for the product in question

European Inventory of Existing Commercial Chemical Substances (EINECS)	Listed.
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EC Inventory	Listed.
United States Toxic Substances Control Act (TSCA) Inventory	Listed.
China Catalog of Hazardous chemicals 2015	Not Listed.
New Zealand Inventory of Chemicals (NZIoC)	Listed.
Philippines Inventory of Chemicals and Chemical Substances (PICCS)	Listed.
Vietnam National Chemical Inventory	Listed.
Chinese Chemical Inventory of Existing Chemical Substances (China IECSC)	Listed.
Korea Existing Chemicals List (KECL)	Listed.

16. OTHER INFORMATION

Abbreviations and acronyms

- CAS: Chemical Abstracts Service
- ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road
- RID: Regulation concerning the International Carriage of Dangerous Goods by Rail
- IMDG: International Maritime Dangerous Goods
- IATA: International Air Transportation Association
- TWA: Time Weighted Average
- STEL: Short term exposure limit
- LC50: Lethal Concentration 50%
- LD50: Lethal Dose 50%
- EC50: Effective Concentration 50%

References

IPCS - The International Chemical Safety Cards (ICSC), website:

<http://www.ilo.org/dyn/icsc/showcard.home>

HSDB - Hazardous Substances Data Bank, website: <https://toxnet.nlm.nih.gov/newtoxnet/hsdb.htm>

IARC - International Agency for Research on Cancer, website: <http://www.iarc.fr/>

eChemPortal - The Global Portal to Information on Chemical Substances by OECD, website:

http://www.echemportal.org/echemportal/index?pageID=0&request_locale=en

CAMEO Chemicals, website: <http://cameochemicals.noaa.gov/search/simple>

ChemIDplus, website: <http://chem.sis.nlm.nih.gov/chemidplus/chemidlite.jsp>

ERG - Emergency Response Guidebook by U.S. Department of Transportation, website:

<http://www.phmsa.dot.gov/hazmat/library/erg>

Germany GESTIS-database on hazard substance, website: <http://www.dguv.de/ifa/gestis/gestis-stoffdatenbank/index-2.jsp>

ECHA - European Chemicals Agency, website: <https://echa.europa.eu/>

Other Information

Special attention needed when toxic materials present in Dimethyl sulphoxide because of enhanced skin absorption.