

According to REACH Regulations (EC) 1907/2006 and (EU) 2020/878

1. Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Product code : GX9093
 Product name : Osmium(VIII) oxide solution, 4% OsO₄
 CAS number : 20816-12-0
 Physical form : liquid, mixture
 REACH : A registration number is not available for this substance as the substance or its uses are exempted from registration, the annual tonnage does not require a registration or the registration is envisaged for a later registration deadline.

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

PC21: Laboratory chemicals.

1.3 Details of the supplier of the safety data sheet

| | | | |
|--------------|------------------------------|-----------|--|
| Company name | : Glentham Life Sciences Ltd | Telephone | : +44 (0) 1225 667 798 |
| | Unit 5 Leafield Way | Fax | : +44 (0) 2033 978 909 |
| | Corsham SN13 9SW | Email | : info@glentham.com |
| | United Kingdom | Web | : www.glentham.com |

1.4 Emergency telephone number

Emergency telephone : NHS Direct 111 (UK, 24 hours), 112 (EU, 24 Hours), +44 (0) 1225 667 798 (09.00 – 17.00 GMT) number

2. Hazards identification

2.1 Classification of the substance or mixture

Classification under CLP according to (EC) 1272/2008

| | |
|------|---------------|
| H300 | Acute Tox. 2 |
| H310 | Acute Tox. 1 |
| H314 | Skin Corr. 1B |
| H330 | Acute Tox. 2 |

2.2 Label elements

Label elements under CLP according to (EC) 1272/2008

Pictograms



GHS05 GHS06

Signal words

Danger

Hazard statements

| | |
|------|---|
| H300 | Fatal if swallowed |
| H310 | Fatal in contact with skin |
| H314 | Causes severe skin burns and eye damage |
| H330 | Fatal if inhaled |

Precautionary statements

| | |
|----------------|--|
| P262 | Do not get in eyes, on skin, or on clothing. |
| P280 | Wear protective gloves/protective clothing/eye protection/face protection. |
| P301+P312 | IF SWALLOWED: call a POISON CENTER/doctor/... IF you feel unwell. |
| P302+P352 | IF ON SKIN: wash with plenty of water. |
| P305+P351+P338 | IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do - continue rinsing. |
| P310 | Immediately call a POISON CENTER or doctor/physician. |
| P260 | Do not breathe vapors. |
| P264 | Do not breathe fume. |

2.3 Other hazards

PBT

This substance is not identified as a PBT substance.

3.0 Composition/information on ingredients

3.2 Mixtures

| Name | Identifier | % | Classification |
|---------------------|---|---|--|
| Osmium (VIII) oxide | CAS: 20816-12-0 EC: 244-058-7 REACH: Not applicable | 4 | H300, Acute Tox. 2 H310, Acute Tox. 2 H314, Skin Corr. 1B H330, Acute Tox. 1 H334, Resp. Sens. 1 |

4. First aid measures

4.1 Description of first aid measures

| | |
|--------------|--|
| Skin contact | Drench the affected skin with running water for 10 minutes or longer if substance is still on skin. Remove all contaminated clothes and footwear immediately unless stuck to skin. Transfer to hospital if there are burns or symptoms of poisoning. |
| Eye contact | Transfer to hospital for specialist examination. Bathe the eye with running water for 15 minutes. |
| Ingestion | Do not induce vomiting. Give 1 cup of water to drink every 10 minutes. If conscious, give half a litre of water to drink immediately. If unconscious and breathing is OK, place in the recovery position. If unconscious, check for breathing and apply artificial respiration if necessary. Transfer to hospital as soon as possible. Wash out mouth with water. |
| Inhalation | If breathing becomes bubbly, have the casualty sit and provide oxygen if available. If conscious, ensure the casualty sits or lies down. If unconscious and breathing is OK, place in the recovery position. If unconscious, check for breathing and apply artificial respiration if necessary. Remove casualty from exposure ensuring one's own safety whilst doing so. Transfer to hospital as soon as possible. |

4.2 Most important symptoms and effects, both acute and delayed

| | |
|-----------------------------|--|
| Skin contact | Absorption through the skin may be fatal. Blistering may occur. Irritation or pain may occur at the site of contact. Progressive ulceration will occur if treatment is not immediate. There may be redness or whiteness of the skin in the area of exposure. |
| Eye contact | Corneal burns may occur. May cause permanent damage. The eyes may water profusely. There may be severe pain. |
| Ingestion | Blood may be vomited. Convulsions may occur. Corrosive burns may appear around the lips. There may be bleeding from the mouth or nose. There may be loss of consciousness. There may be soreness and redness of the mouth and throat. There may be vomiting. |
| Inhalation | Absorption through the lungs can occur causing symptoms similar to those of ingestion. Convulsions may occur. Exposure may cause coughing or wheezing. There may be loss of consciousness. There may be shortness of breath with a burning sensation in the throat. There may be vomiting. |
| Delayed / immediate effects | Convulsions may occur. Immediate effects can be expected after short-term exposure. There may be bleeding from the mouth or nose. There may be loss of consciousness. |

4.3 Indication of any immediate medical attention and special treatment needed

Immediate / special treatment

Do not induce vomiting. Immediate medical attention is required. Show this safety data sheet to the doctor in attendance. Eye bathing equipment should be available on the premises.

5. Fire-fighting measures

5.1 Extinguishing media

Suitable extinguishing media for the surrounding fire should be used. Use water spray to cool containers.

5.2 Special hazards arising from the substance or mixture

Exposure hazards

Corrosive. In combustion emits toxic fumes. Toxic.

5.3 Advice for fire-fighters

Wear protective clothing to prevent contact with skin and eyes. Wear self-contained breathing apparatus.

6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions

Do not attempt to take action without suitable protective clothing - see section 8 of SDS. If outside do not approach from downwind. If outside keep bystanders upwind and away from danger point. Mark out the contaminated area with signs and prevent access to unauthorised personnel. Notify the police and fire brigade immediately. Turn leaking containers leak-side up to prevent the escape of liquid.

6.2 Environmental precautions

Contain the spillage using bunding. Do not discharge into drains or rivers.

6.3 Methods and material for containment and cleaning up

Clean-up procedures

Clean-up should be dealt with only by qualified personnel familiar with the specific substance. Transfer to a closable, labelled salvage container for disposal by an appropriate method. Absorb into dry earth or sand.

6.4 Reference to other sections

Refer to section 8 of SDS.

7. Handling and storage

7.1 Precautions for safe handling

Handling requirements

Avoid direct contact with the substance. Avoid the formation or spread of dust in the air. Do not handle in a confined space. Ensure there is exhaust ventilation of the area. Ensure there is sufficient ventilation of the area.

7.2 Conditions for safe storage, including any incompatibilities

Storage conditions

Avoid contact with water or humidity. Keep container tightly closed. Store in cool, well ventilated area.

7.3 Specific end use(s)

No data available.

8. Exposure controls/personal protection

8.1 Control parameters

Workplace exposure limits

| Substance (CAS) | Control Parameter | Value | Notes | Source |
|---------------------------------------|---|--------|-------|------------------|
| Osmium tetroxide (as Os) (20816-12-0) | Long-term Exposure Limit (ppm) | 0.0002 | | UK HSE EH40/2005 |
| | Long-term Exposure Limit (mg m ⁻³) | 0.002 | | |
| | Short-term Exposure Limit (ppm) | 0.0006 | | |
| | Short-term Exposure Limit (mg m ⁻³) | 0.006 | | |

8.2 Exposure controls

| | |
|------------------------|--|
| Engineering measures | Ensure there is exhaust ventilation of the area. Ensure there is sufficient ventilation of the area. |
| Respiratory protection | Respiratory protective device with particle filter. Self-contained breathing apparatus must be available in case of emergency. |
| Hand protection | Impermeable gloves. Protective gloves. |

| | |
|-----------------|---|
| Eye protection | Ensure eye bath is to hand. Safety glasses with side-shields. Tightly fitting safety goggles. |
| Skin protection | Protective clothing. |

9. Physical and chemical properties

9.1 Information on basic physical and chemical properties

| | |
|---|----------------------------|
| Physical state | Liquid |
| Colour | Colourless |
| Odour | No data available. |
| Melting point/Freezing point | 40.6 °C |
| Boiling point/initial boiling point/boiling range | 130.0 °C @ Press: 760 Torr |
| Flammability | No data available. |
| Lower/Upper explosion limit | No data available. |
| Flash Point | No data available. |
| Auto-ignition temperature | No data available. |
| Decomposition temperature | No data available. |
| pH | No data available. |
| Kinematic viscosity | No data available. |
| Solubility | No data available. |
| Partition coefficient n-octanol/water | No data available. |
| Vapour pressure | No data available. |
| Density/relative density | 4.900 |
| Relative vapour pressure | No data available. |
| Particle characteristics | No data available. |

9.2 Other information

No data available.

10. Stability and reactivity

10.1 Reactivity

Stable under recommended transport or storage conditions.

10.2 Chemical stability

Stable under normal conditions.

10.3 Possibility of hazardous reactions

Hazardous reactions

Decomposition may occur on exposure to conditions or materials listed below. Hazardous reactions will not occur under normal transport or storage conditions.

10.4 Conditions to avoid

Flames. Hot surfaces. Heat.

10.5 Incompatible materials

Materials to avoid

Strong acids. Strong oxidising agents.

11. Toxicological information

11.1 Information on toxicological effects

a) Acute toxicity

Osmium tetroxide (as Os)

96 hr LC50 Copepod (Nitocra spinipes) (Aquatic): Oct-50 ug/L

LD50 Rat (IP): 14.1 mg/kg

LD50 Mouse (IP): 13.5 mg/kg

LD50 Mouse (Oral): 162 mg/kg

b) Skin corrosion/irritation

Skin corrosion/irritation (Category 1B)

c) Serious eye damage/irritation

No data available.

d) Respiratory or skin sensitisation

Osmium tetroxide (as Os): Respiratory Sensitising (majority submitters) (ECHA Property of Concern)

e) **Germ cell mutagenicity**

No data available.

f) **Carcinogenicity**

No data available.

g) **Reproductive toxicity**

No data available.

h) **STOT-single exposure**

No data available.

i) **STOT-repeated exposure**

No data available.

j) **Aspiration hazard**

No data available.

11.2 **Symptoms / routes of exposure**

| | |
|------------------------------------|--|
| Skin contact | Absorption through the skin may be fatal. Blistering may occur. Irritation or pain may occur at the site of contact. Progressive ulceration will occur if treatment is not immediate. There may be redness or whiteness of the skin in the area of exposure. |
| Eye contact | Corneal burns may occur. May cause permanent damage. The eyes may water profusely. There may be severe pain. |
| Ingestion | Blood may be vomited. Convulsions may occur. Corrosive burns may appear around the lips. There may be bleeding from the mouth or nose. There may be loss of consciousness. There may be soreness and redness of the mouth and throat. There may be vomiting. |
| Inhalation | Absorption through the lungs can occur causing symptoms similar to those of ingestion. Convulsions may occur. Exposure may cause coughing or wheezing. There may be loss of consciousness. There may be shortness of breath with a burning sensation in the throat. There may be vomiting. |
| Delayed / immediate effects | Convulsions may occur. Immediate effects can be expected after short-term exposure. There may be bleeding from the mouth or nose. There may be loss of consciousness. |
| Other information | No data available. |

12. **Ecological information**

12.1 **Toxicity**

No data available.

12.2 **Persistence and degradability**

Biodegradable.

12.3 **Bioaccumulative potential**

No bioaccumulation potential.

12.4 **Mobility in soil**

Readily absorbed into soil.

12.5 **Results of PBT and vPvB assessment**

This substance is not identified as a PBT substance.

12.6 **Endocrine disrupting properties**

This substance is not identified as having endocrine disrupting properties

12.7 **Other adverse effects**

No data available.

13. **Disposal considerations**

13.1 **Waste treatment methods**






Disposal operations

Transfer to a suitable container and arrange for collection by specialised disposal company.

NB

The user's attention is drawn to the possible existence of regional or national regulations regarding disposal.

14. Transport information

| ADR | IMDG | IATA | ADN | RID |
|--|--|---|--|--|
| 14.1. UN number | | | | |
| UN3287 | UN3287 | UN3287 | UN3287 | UN3287 |
| 14.2. UN proper shipping name | | | | |
| TOXIC LIQUID, INORGANIC, N.O.S. | TOXIC LIQUID, INORGANIC, N.O.S. | Toxic liquid, inorganic, n.o.s. | TOXIC LIQUID, INORGANIC, N.O.S. | TOXIC LIQUID, INORGANIC, N.O.S. |
| Transport document description | | | | |
| UN3287 TOXIC LIQUID, INORGANIC, N.O.S. (OSMIUM(VIII) OXIDE SOLUTION, 4% OSO ₄), 6.1, II | UN3287 TOXIC LIQUID, INORGANIC, N.O.S. (OSMIUM(VIII) OXIDE SOLUTION, 4% OSO ₄), 6.1, II | UN3287 Toxic liquid, inorganic, n.o.s. (Osmium(VIII) oxide solution, 4% OsO ₄), 6.1, II | UN3287 TOXIC LIQUID, INORGANIC, N.O.S. (OSMIUM(VIII) OXIDE SOLUTION, 4% OSO ₄), 6.1, II | UN3287 TOXIC LIQUID, INORGANIC, N.O.S. (OSMIUM(VIII) OXIDE SOLUTION, 4% OSO ₄), 6.1, II |
| 14.3. Transport hazard class(es) | | | | |
| 6.1 | 6.1 | 6.1 | 6.1 | 6.1 |
|  |  |  |  |  |
| 14.4. Packing group | | | | |
| II | II | II | II | II |
| 14.5. Environmental hazards | | | | |
| No | No | No | No | No |

15. Regulatory information

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

This Safety Data Sheet is prepared in accordance with Commission Regulation (EC) 1907/2006, amended by Commission Regulation (EU) 2020/787.

Authorisations/Restrictions

| | |
|--|--------------------|
| Regulation (EC) 1907/2006, REACH, Annex XIV list of substances subject to authorisation: | No data available. |
| Regulation (EC) 1907/2006, REACH, Annex XVII restrictions on the manufacture, placing on the market and use of certain dangerous substances: | No data available. |
| Regulation (EC) 1005/2009 on substances that deplete the ozone layer: | No data available. |
| Regulation (EC) 850/2004 on persistent organic pollutants, amended by (EU) No 2019/1021: | No data available. |

15.2 Chemical safety assessment

A chemical safety assessment has not been carried out for the substance or the mixture by the supplier.

16. Other information

H-Statement Full Texts

| | |
|------|---|
| H300 | Fatal if swallowed |
| H310 | Fatal in contact with skin |
| H314 | Causes severe skin burns and eye damage |
| H330 | Fatal if inhaled |
| H334 | May cause allergy or asthma symptoms or breathing difficulties if inhaled |

Abbreviations Full Texts

| | |
|-----------|---|
| ADN | European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways |
| ADR | European Agreement concerning the International Carriage of Dangerous Goods by Road |
| ALARP | As low as is reasonably practicable |
| CAS | Chemical Abstracts Service |
| CLP | Classification, Labelling and Packaging Regulations |
| COSHH | Control of Substances Hazardous to Health |
| EC Number | European Community Number |
| EC50 | Effective Concentration 50% |
| EILINCS | European List of Notified Chemical Substances |
| EINECS | European Inventory of Existing Commercial Chemical Substances |
| GHS | Globally Harmonised System |
| HSE | Health & Safety Executive UK |
| IATA | International Air Transport Association |
| IM | Intramuscular |
| IMDG | The International Maritime Dangerous Goods Code |
| IP | Intraperitoneal |
| IV | Intravascular |
| LD50 | Lethal Dose 50% |
| LOEC | Lowest Observable Effective Concentration |
| LTEL | Long Term Exposure Limit |
| NOEC | No Observable Effective Concentration |
| OECD | Organisation for Economic Cooperations and Development |
| PBT | Persistent Bioaccumulative Toxic |
| PPE | Personal Protective Equipment |
| REACH | Registration, Evaluation, Authorisation and Restriction of Chemicals |
| RID | Regulations Concerning the International Carriage of Dangerous Goods by Rail |
| SC | Subcutaneous |
| SDS | Safety Data Sheet |
| STEL | Short Term Exposure Limit |
| VOC | Volatile Organic Compounds |
| vPvB | Very Persistent and Very Bioaccumulative |
| WEL | Workplace Exposure Limits |

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