

**Safety data sheet**  
according to 1907/2006/EC, Article 31

Printing date 05.05.2023

Version number 4

Revision: 05.05.2023

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

· **1.1 Product identifier**

· **Trade name:** *Osmium tetroxide*  
*4 % solution for electron microscopy*



· **Article number:** 31253

· **1.2 Relevant identified uses of the substance or mixture and uses advised against**  
No further relevant information available.

· **Application of the substance / the mixture:** Laboratory chemicals

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

· **Manufacturer/Supplier:**

SERVA Electrophoresis GmbH

Carl-Benz-Str. 7

D-69115 Heidelberg

Tel.: +49 6221 13840-0

FAX: +49 6221 13840-10

msds.info@serva.de

· **Information department:** Product Safety department Tel.: +49 6221 13840-35

· **1.4 Emergency telephone number:**

Medical Emergency Information in case of poisoning:

Poison Information Center Mainz - Phone: +49 (0) 6131 19240

(advisory service in German or English language)

**SECTION 2: Hazards identification**

· **2.1 Classification of the substance or mixture**

· **Classification according to Regulation (EC) No 1272/2008:**



GHS06

Acute Tox. 2 H310 Fatal in contact with skin.



GHS05

Eye Dam. 1 H318 Causes serious eye damage.



GHS07

Acute Tox. 4 H302 Harmful if swallowed.

Acute Tox. 4 H332 Harmful if inhaled.

Skin Irrit. 2 H315 Causes skin irritation.

STOT SE 3 H335 May cause respiratory irritation.

· **2.2 Label elements**

· **Labelling according to Regulation (EC) No 1272/2008:**

The product is classified and labelled according to the GB CLP regulation.

· **Hazard pictograms:** GHS05, GHS06

· **Signal word:** Danger

· **Hazard-determining components of labelling:**

osmium tetroxide

(Contd. on page 2)

GB

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(Contd. of page 1)

· **Hazard statements:**

H302+H332 Harmful if swallowed or if inhaled.

H310 Fatal in contact with skin.

H315 Causes skin irritation.

H318 Causes serious eye damage.

H335 May cause respiratory irritation.

· **Precautionary statements**

P280 Wear protective gloves/protective clothing/eye protection/face protection/hearing protection.

P301+P312 IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell.

P302+P352 IF ON SKIN: Wash with plenty of soap and water.

P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P361+P364 Take off immediately all contaminated clothing and wash it before reuse.

· **Labelling of packages where the contents do not exceed 125 ml**

· **Hazard pictograms** GHS05, GHS06

· **Signal word** Danger

· **Hazard-determining components of labelling:**

osmium tetroxide

· **Hazard statements**

H310 Fatal in contact with skin.

H318 Causes serious eye damage.

· **Precautionary statements**

P280 Wear protective gloves/protective clothing/eye protection/face protection/hearing protection.

P301+P312 IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell.

P302+P352 IF ON SKIN: Wash with plenty of soap and 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.

· **2.3 Other hazards**

· **Results of PBT and vPvB assessment:**

· **PBT:** PBT - assessment not available.

· **vPvB:** vPvB - assessment not available.

· **Determination of endocrine-disrupting properties** No further relevant information available.

**SECTION 3: Composition/information on ingredients**

· **3.2 Mixtures**

· **Description:** aqueous solution

· **Empirical formula:**

7732-18-5	water, distilled, conductivity or of similar purity	H <sub>2</sub> O
20816-12-0	osmium tetroxide	Os O <sub>4</sub>

· **Dangerous components:**

CAS: 20816-12-0	osmium tetroxide	2,5-7%
EINECS: 244-058-7	☠ Acute Tox. 2, H300; Acute Tox. 1, H310; Acute Tox. 2, H330; ☠ Skin Corr. 1B, H314	

· **Additional information**

the product contains no further substances which shall be indicated according to UK REACH-Regulation (Regulation (EC) No. 1907/2006).

For the wording of the listed hazard phrases refer to section 16.

GB

(Contd. on page 3)

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**Trade name: Osmium tetroxide**  
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(Contd. of page 2)

**SECTION 4: First aid measures**

- **4.1 Description of first aid measures**
- **General information:**  
Remove contaminated clothing.  
Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.
- **After inhalation:** Supply fresh air and to be sure call for a doctor.
- **After skin contact:**  
Immediate wash with copious amounts of water and soap; rinse thoroughly; seek medical advice.
- **After eye contact:**  
Rinse opened eye for several minutes under running water. Remove present contact lenses, if easy to do, and continue rinsing. Consult ophthalmologist immediately.
- **After swallowing:**  
Wash out mouth. Drink plenty of water and supply fresh air.  
Do not induce vomiting; call for medical help immediately.
- **4.2 Most important symptoms and effects, both acute and delayed**  
No further relevant information available.
- **4.3 Indication of any immediate medical attention and special treatment needed**  
No further relevant information available.

**SECTION 5: Firefighting measures**

- **5.1 Extinguishing media**
- **Suitable extinguishing agents:**  
CO<sub>2</sub>, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
- **5.2 Special hazards arising from the substance or mixture:**  
In case of fire formation of toxic vapours and gases is possible.
- **5.3 Advice for firefighters**
- **Protective equipment:** Wear self-contained respiratory protective device.

**SECTION 6: Accidental release measures**

- **6.1 Personal precautions, protective equipment and emergency procedures**  
Wear protective clothing.  
Ensure adequate ventilation
- **6.2 Environmental precautions:** Do not allow to enter sewers/ surface or ground water.
- **6.3 Methods and material for containment and cleaning up**  
Dispose contaminated material as waste according to item 13.  
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
- **6.4 Reference to other sections**  
See Section 7 for information on safe handling  
See Section 8 for information on personal protection equipment.  
See Section 13 for disposal information.

**SECTION 7: Handling and storage**

- **7.1 Precautions for safe handling:**  
Ensure good ventilation/exhaustion at the workplace.  
Open and handle receptacle with care.
- **Information about protection against explosions and fires:** Keep respiratory protective device available.
- **7.2 Conditions for safe storage, including any incompatibilities**
- **Storage**
- **Requirements to be met by storerooms and receptacles:** Store only in unopened original receptacles.

(Contd. on page 4)

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Version number 4

Revision: 05.05.2023

**Trade name: Osmium tetroxide**  
**4 % solution for electron microscopy**

(Contd. of page 3)

- **Information about storage in one common storage facility:** Not required.
- **Further information about storage conditions:**  
Keep receptacle tightly sealed and store in dry conditions.  
Store under lock and key and with access restricted to technical experts or their assistants only.
- **7.3 Specific end use(s):** No further relevant information available.

**SECTION 8: Exposure controls/personal protection**

· **8.1 Control parameters**

- **Components with limit values that require monitoring at the workplace:**

**20816-12-0 osmium tetroxide (2.5-7%)**

WEL	Short-term value: 0.006 mg/m <sup>3</sup> , 0.0006 ppm Long-term value: 0.002 mg/m <sup>3</sup> , 0.0002 ppm (as Os)
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- **Additional information:** The lists that were valid during the creation were used as basis.

· **8.2 Exposure controls**

- **Appropriate engineering controls:** No further data; see item 7.
- **Individual protection measures, such as personal protective equipment:**
- **General protective and hygienic measures:**  
Keep away from foodstuffs, beverages and feed.  
Immediately remove all soiled and contaminated clothing  
Wash hands before breaks and at the end of work.  
Store protective clothing separately.  
Avoid contact with the eyes and skin.
- **Breathing equipment:**  
Short term filter device:  
Filter ABEK-P2
- **Hand protection:**  
Rubber gloves  
Neoprene gloves  
The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.  
Protective gloves.  
Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.  
Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation
- **Material of gloves:**  
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.  
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.
- **Penetration time of glove material:**  
The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.
- **For the permanent contact of a maximum of 15 minutes gloves made of the following materials are suitable:**  
Chloroprene rubber, CR  
Nitrile rubber, NBR
- **Eye/face protection:** Tightly sealed goggles.

(Contd. on page 5)

GB

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## according to 1907/2006/EC, Article 31

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Version number 4

Revision: 05.05.2023

**Trade name: Osmium tetroxide**  
**4 % solution for electron microscopy**

(Contd. of page 4)

· **Body protection:** Protective work clothing.

### SECTION 9: Physical and chemical properties

#### · 9.1 Information on basic physical and chemical properties

##### · General Information:

· <b>Physical state:</b>	Fluid
· <b>Colour:</b>	Colourless
· <b>Odour:</b>	Odourless
· <b>Odour threshold:</b>	no information available
· <b>Melting point/freezing point:</b>	undetermined
· <b>Boiling point or initial boiling point and boiling range:</b>	no information available
· <b>Flammability:</b>	no information available
· <b>Lower and upper explosion limit:</b>	
· <b>Lower:</b>	no information available
· <b>Upper:</b>	no information available
· <b>Flash point:</b>	no information available
· <b>Decomposition temperature:</b>	no information available
· <b>pH:</b>	no information available
· <b>Viscosity:</b>	
· <b>Kinematic viscosity:</b>	no information available
· <b>Dynamic viscosity:</b>	no information available
· <b>Solubility:</b>	
· <b>Water:</b>	Fully miscible
· <b>Partition coefficient n-octanol/water (log value):</b>	no information available
· <b>Vapour pressure:</b>	Not determined.
· <b>Density and/or relative density:</b>	
· <b>Density:</b>	Not determined
· <b>Relative density:</b>	no information available

#### · 9.2 Other information

· <b>Appearance:</b>	There are no more data available.
· <b>Form:</b>	Solution
· <b>Important information on protection of health and environment, and on safety:</b>	
· <b>Explosive properties:</b>	Product does not present an explosion hazard.
· <b>VOC %:</b>	0.00 %

### SECTION 10: Stability and reactivity

- **10.1 Reactivity:** No further relevant informations available
- **10.2 Chemical stability:**
- **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
- **10.3 Possibility of hazardous reactions:** No further relevant informations available.
- **10.4 Conditions to avoid:** No further relevant information available.
- **10.5 Incompatible materials:** No further relevant information available.
- **10.6 Hazardous decomposition products:** In case of fire: See Section 5

GB

(Contd. on page 6)

**Safety data sheet**  
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Printing date 05.05.2023

Version number 4

Revision: 05.05.2023

**Trade name: Osmium tetroxide**  
**4 % solution for electron microscopy**

(Contd. of page 5)

### SECTION 11: Toxicological information

· **11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008:**

· **Acute toxicity:**

Harmful if swallowed or if inhaled.

Fatal in contact with skin.

· **LD/LC50 values that are relevant for classification:**

**20816-12-0 osmium tetroxide**

Oral	LD50	15 mg/kg (rat)
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· **Skin corrosion/irritation:** Causes skin irritation.

· **Serious eye damage/irritation:**

Causes serious eye damage.

Causes serious eye damage.

· **Respiratory or skin sensitisation:** Based on available data, the classification criteria are not met.

· **Germ cell mutagenicity:** Based on available data, the classification criteria are not met.

· **Carcinogenicity:** Based on available data, the classification criteria are not met.

· **Reproductive toxicity:** Based on available data, the classification criteria are not met.

· **STOT-single exposure:** May cause respiratory irritation.

· **STOT-repeated exposure:** Based on available data, the classification criteria are not met.

· **Aspiration hazard:** Based on available data, the classification criteria are not met.

· **11.2 Information on other hazards:**

· **Endocrine disrupting properties:** no relevant information available

### SECTION 12: Ecological information

· **12.1 Toxicity:**

· **Aquatic toxicity:** No further relevant information available.

· **12.2 Persistence and degradability:** No further relevant information available.

· **12.3 Bioaccumulative potential:** No further relevant information available.

· **12.4 Mobility in soil:** No further relevant information available.

· **12.5 Results of PBT and vPvB assessment:**

· **PBT:** PBT - assessment not available.

· **vPvB:** vPvB - assessment not available.

· **12.6 Endocrine disrupting properties:** For information on endocrine disrupting properties see section 11.

· **12.7 Other adverse effects:**

· **Additional ecological information:**

· **General notes:**

Do not allow product to reach ground water, water course or sewage system.

Water danger class 3 (German Regulation) (Self-assessment): extremely hazardous for water.

### SECTION 13: Disposal considerations

· **13.1 Waste treatment methods**

· **Recommendation**

Disposal must be made according to official regulations.

Must not be disposed of together with household garbage. Do not allow product to reach sewage system.

· **Uncleaned packagings:**

· **Recommendation:**

Disposal of uncleaned packagings must be made according to official regulations in the same manner as the product.

(Contd. on page 7)

GB



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according to 1907/2006/EC, Article 31

Printing date 05.05.2023

Version number 4

Revision: 05.05.2023

**Trade name: Osmium tetroxide**  
**4 % solution for electron microscopy**

(Contd. of page 6)

· **Recommended cleansing agent:** Water, if necessary with cleansing agents.

**SECTION 14: Transport information**

· **14.1 UN number or ID number**

· **ADR, IMDG, IATA** UN3287

· **14.2 UN proper shipping name**

· **ADR** 3287 TOXIC LIQUID, INORGANIC, N.O.S. (OSMIUM TETROXIDE SOLUTION)

· **IMDG, IATA** TOXIC LIQUID, INORGANIC, N.O.S. (OSMIUM TETROXIDE SOLUTION)

· **14.3 Transport hazard class(es)**

· **ADR, IMDG, IATA**



· **Class:** 6.1 Toxic substances.

· **Label:** 6.1

· **14.4 Packing group**

· **ADR, IMDG, IATA** II

· **14.5 Environmental hazards**

· **Marine pollutant:** No

· **14.6 Special precautions for user**

Warning: Toxic substances.

· **Hazard identification number (Kemler code):** 60

· **EMS Number:** F-A,S-A

· **Stowage Category** B

· **Stowage Code** SW2 Clear of living quarters.

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

Not applicable.

· **Transport/Additional information:**

· **ADR**

· **Limited quantities (LQ)** 100 ml

· **Excepted quantities (EQ)** Code: E4

Maximum net quantity per inner packaging: 1 ml

Maximum net quantity per outer packaging: 500 ml

· **Transport category** 2

· **Tunnel restriction code** D/E

· **IMDG**

· **Limited quantities (LQ)** 100 ml

· **Excepted quantities (EQ)** Code: E4

Maximum net quantity per inner packaging: 1 ml

Maximum net quantity per outer packaging: 500 ml

· **UN "Model Regulation":**

UN 3287 TOXIC LIQUID, INORGANIC, N.O.S. (OSMIUM TETROXIDE SOLUTION), 6.1, II

GB

(Contd. on page 8)

**Safety data sheet**  
according to 1907/2006/EC, Article 31

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Revision: 05.05.2023

**Trade name: Osmium tetroxide**  
**4 % solution for electron microscopy**

(Contd. of page 7)

**SECTION 15: Regulatory information**

- **15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture**
- **Directive 2012/18/EU**
- **Named dangerous substances - ANNEX I** None of the ingredients is listed.
- **Seveso category H2 ACUTE TOXIC**
- **Qualifying quantity (tonnes) for the application of lower-tier requirements** 50 t
- **Qualifying quantity (tonnes) for the application of upper-tier requirements** 200 t
- **REGULATION (EC) No 1907/2006 ANNEX XVII** Conditions of restriction: 3

· **DIRECTIVE 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment – Annex II**

None of the ingredients is listed.

· **REGULATION (EU) 2019/1148**

· **Regulation (EC) No 273/2004 on drug precursors**

None of the ingredients is listed.

· **Regulation (EC) No 111/2005 laying down rules for the monitoring of trade between the Community and third countries in drug precursors**

None of the ingredients is listed.

· **National regulations:**

· **Technical instructions (air):**

Class	Share in %
Wasser	80-100
I	2.5-7

- **Water hazard class: Water danger class 3 (Self-assessment): extremely hazardous for water.**
- **15.2 Chemical safety assessment: A Chemical Safety Assessment has not been carried out.**

**SECTION 16: Other information**

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· **Relevant phrases**

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

· **Department issuing SDS: Product safety department**

· **Contact: +49 6221 13840-35**

· **Date of previous version: 18.04.2023**

· **Abbreviations and acronyms:**

RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)

ICAO: International Civil Aviation Organisation

PBT: persistent, bioaccumulative, toxic substance (UK REACH)

vPvB: very persistent, very bioaccumulative substance (UK REACH)

UK REACH: Regulation concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals

GB CLP: Regulation on classification, labelling and packaging of substances and mixtures

bw: body weight

ADR: Accord relatif au transport international 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 Harmonised System of Classification and Labelling of Chemicals

EINECS: European Inventory of Existing Commercial Chemical Substances

ELINCS: European List of Notified Chemical Substances

(Contd. on page 9)



**Safety data sheet**  
according to 1907/2006/EC, Article 31

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Version number 4

Revision: 05.05.2023

**Trade name: Osmium tetroxide**  
**4 % solution for electron microscopy**

(Contd. of page 8)

CAS: Chemical Abstracts Service (division of the American Chemical Society)

LC50: Lethal concentration, 50 percent

LD50: Lethal dose, 50 percent

PBT: Persistent, Bioaccumulative and Toxic

vPvB: very Persistent and very Bioaccumulative

Acute Tox. 2: Acute toxicity – Category 2

Acute Tox. 4: Acute toxicity – Category 4

Acute Tox. 1: Acute toxicity – Category 1

Skin Corr. 1B: Skin corrosion/irritation – Category 1B

Skin Irrit. 2: Skin corrosion/irritation – Category 2

Eye Dam. 1: Serious eye damage/eye irritation – Category 1

STOT SE 3: Specific target organ toxicity (single exposure) – Category 3

GB