Safety Data Sheet
acc. to OSHA HCS

Printing date 09/23/2024 *Reviewed on 09/23/2024*

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1 Identification

· **Product identifier**

· **Trade name: Osmium tetroxide**

· **Article number:** 31251
· **CAS Number:**
20816-12-0
· **EC number:**
244-058-7
· **Index number:**
076-001-00-5
· **Application of the substance / the mixture:** Laboratory chemicals

· **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
· **Emergency telephone number:**
Emergency medical information in case of poisoning
Poison Information Center Mainz-Tel: +49 (0) 6131 19240
(Advice in German and English)

2 Hazard(s) identification

· **Classification of the substance or mixture**

GHS06

Acute Toxicity - Oral 2	H300 Fatal if swallowed.
Acute Toxicity - Dermal 1	H310 Fatal in contact with skin.
Acute Toxicity - Inhalation 2	H330 Fatal if inhaled.

GHS05

Skin Corrosion 1B	H314 Causes severe skin burns and eye damage.

· **Label elements**
· **GHS label elements**
The substance is classified and labeled according to the Globally Harmonized System (GHS).
· **Hazard pictograms:** GHS05, GHS06
· **Signal word:** Danger
· **Hazard statements:**
Fatal if swallowed, in contact with skin or if inhaled.
Causes severe skin burns and eye damage.
· **Precautionary statements**
Do not breathe dust.
Wear protective gloves/protective clothing/eye protection/face protection.
If swallowed: Immediately call a poison center/doctor.
If on skin: Wash with plenty of soap and water.

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IF INHALED: Remove person to fresh air and keep comfortable for breathing.
If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
Store in a well-ventilated place. Keep container tightly closed.
Store locked up.
Dispose of contents/container in accordance with local/regional/national/international regulations.

· **Classification system:**
· **NFPA ratings (scale 0 - 4)**

Health = 4
Fire = 0
Reactivity = 0

· **HMIS-ratings (scale 0 - 4)**

Health = 4
Fire = 0
Reactivity = 0

· **Other hazards**
· **Results of PBT and vPvB assessment:**
· **PBT:** *PBT - Assessment not available.*
· **vPvB:** *vPvB - Assessment not available.*

3 Composition/information on ingredients

· **Chemical characterization: Substances**
· **CAS No. Description:**
20816-12-0 osmium tetraoxide
· **Identification number(s):**
· **EC number:** *244-058-7*
· **Index number:** *076-001-00-5*
· **Description:**
· **Empirical formula:** OsO_4
· **MW:** *254.2*

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4 First-aid measures

· **Description of first aid measures**
· **General information:**
Remove breathing apparatus only after contaminated clothing have been completely removed.
· **After inhalation:** *Supply fresh air and to be sure call for a doctor.*
· **After skin contact:**
Wash off immediately with plenty of soap and water; rinse thoroughly; seek medical attention.
· **After eye contact:**
Rinse opened eye for several minutes with running water. Remove existing contact lenses, if possible, and continue rinsing. Consult an ophthalmologist immediately.
· **After swallowing:**
Do not induce vomiting!
Drink copious amounts of water and provide fresh air. Immediately call a doctor.
· **Most important symptoms and effects, both acute and delayed**
Gastric or intestinal disorders
Coughing
Breathing difficulty

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· **Indication of any immediate medical attention and special treatment needed**
No further relevant information available.

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5 Fire-fighting measures

· **Extinguishing media**
· **Suitable extinguishing agents:**
CO_2, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
· **Special hazards arising from the substance or mixture**
During heating or in case of fire poisonous gases are produced.
· **Advice for firefighters**
· **Protective equipment:**
Wear self-contained breathing apparatus.
Wear fully protective suit.
· **Additional information**
Dispose of fire debris and contaminated fire fighting water in accordance with official regulations.
Collect contaminated fire fighting water separately. It must not enter the sewage system.

6 Accidental release measures

· **Personal precautions, protective equipment and emergency procedures**
Wear protective clothing.
Ensure adequate ventilation
Avoid formation of dust.
Do not inhale dusts.
Avoid contact with eyes and skin.
· **Environmental precautions:** Do not allow to enter sewers/ surface or ground water.
· **Methods and material for containment and cleaning up**
Dispose contaminated material as waste according to section 13.
Pick up mechanically.
· **Protective Action Criteria for Chemicals**
· **PAC-1:** 6.00E-04 ppm
· **PAC-2:** 0.0084 ppm
· **PAC-3:** 4.0 ppm
· **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.

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7 Handling and storage

· **Precautions for safe handling:**
Ensure good ventilation/exhaustion at the workplace.
Open and handle receptacle with care.
Prevent formation of dust.
· **Information about protection against explosions and fires:** No special measures required.

· **Conditions for safe storage, including any incompatibilities**
· **Storage:**
· **Requirements to be met by storerooms and receptacles:** No special requirements.
· **Information about storage in one common storage facility:**
Store away from flammable substances.
Store away from oxidizing agents.
· **Further information about storage conditions:**
Store under lock and key and with access restricted to technical experts or their assistants only.
Store container tightly closed and dry.

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· **Specific end use(s):** No further relevant information available.

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8 Exposure controls/personal protection

· **Control parameters**

· **Components with limit values that require monitoring at the workplace:**	
20816-12-0 osmium tetraoxide (80-100%)	
PEL	Long-term value: 0.002* mg/m³ *as Os
REL	Short-term value: 0.006 mg/m³, 0.0006 ppm Long-term value: 0.002 mg/m³, 0.0002 ppm
TLV	Short-term value: 0.0006 ppm Long-term value: 0.0002 ppm

· **Additional information:** The lists that were valid during the creation were used as basis.

· **Exposure controls**
· **Additional information about design of technical systems:** No further data; see section 7.
· **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 P3
· **Protection of hands:**
Neoprene gloves
The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
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.
· **Penetration time of glove material:**
The exact break trough 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 protection:** Safety glasses
· **Body protection:** Protective work clothing

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9 Physical and chemical properties

· **Information on basic physical and chemical properties**
· **General Information:**

· **Color:**	yellow to greenish
· **Odor:**	Pungent
· **Odor threshold:**	Not determined.

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· **Melting point/Melting range:**	40 °C (104 °F)
· **Boiling point/Boiling range:**	130 °C (266 °F)
· **Flammability (solid, gaseous):**	Product is not flammable.
· **Explosion limits:**	
· **Lower:**	not applicable
· **Upper:**	not applicable
· **Flash point:**	Not applicable.
· **Decomposition temperature:**	No information available
· **Viscosity:**	
· **Kinematic viscosity:**	Not applicable.
· **Dynamic viscosity:**	Not applicable.
· **Solubility in / Miscibility with:**	
· **Water at 20 °C (68 °F):**	65 g/l
· **Partition coefficient (n-octanol/water):**	No information available
· **Vapor pressure at 20 °C (68 °F):**	10 hPa (7.5 mm Hg)
· **Vapor pressure:**	
· **Density at 20 °C (68 °F):**	4.91 g/cm³ (40.97395 lbs/gal)
· **Relative density:**	No information available
· **Other information**	
· **Appearance:**	
· **Form:**	Crystalline
· **Important information on protection of health and environment, and on safety:**	
· **Danger of explosion:**	Product does not present an explosion hazard.
· **Molecular weight**	254.2 g/mol

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10 Stability and reactivity

· **Reactivity:** No further relevant information available.
· **Chemical stability:**
· **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
· **Possibility of hazardous reactions:** Reacts with flammable substances.
· **Conditions to avoid:** High temperatures
· **Incompatible materials:** Avoid contact with: Metals
· **Hazardous decomposition products:** In case of fire: see section 5
· **Additional information:**
photosensitive
sublimable

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11 Toxicological information

· **Information on toxicological effects**
· **Acute toxicity:** Fatal if swallowed, in contact with skin or if inhaled.

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

Oral	LD50	15 mg/kg (rat)

· **on the skin:** Causes severe skin burns and eye damage.
· **Additional toxicological information:**

· **Carcinogenic categories**
· **IARC (International Agency for Research on Cancer)** Substance is not listed.
· **NTP (National Toxicology Program)** Substance is not listed.
· **OSHA-Ca (Occupational Safety & Health Administration)** Substance is not listed.

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12 Ecological information

· **Toxicity:**
· **Aquatic toxicity:** No further relevant information available.
· **Persistence and degradability:** No further relevant information available.
· **Bioaccumulative potential:** No further relevant information available.
· **Mobility in soil:** No further relevant information available.
· **Results of PBT and vPvB assessment:**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.
· **Other adverse effects:**
· **Additional ecological information:**
· **General notes:**
Do not allow product to reach ground water, water course or sewage system.
Water hazard class 3 (Self-assessment): extremely hazardous for water

13 Disposal considerations

· **Waste treatment methods**
· **Recommendation:**
Dispose of in accordance with official regulations.
Must not be disposed of together with household garbage. Do not allow product to reach sewage system.

· **Uncleaned packagings:**
· **Recommendation:**
Uncleaned packaging must be disposed of in the same way as the product in accordance with official regulations.
· **Recommended cleansing agent:** Water, if necessary with cleansing agents.

14 Transport information

· **UN-Number**	
· **DOT, ADR, IMDG, IATA**	UN2471
· **UN proper shipping name**	
· **DOT**	Osmium tetroxide
· **ADR**	2471 OSMIUM TETROXIDE
· **IMDG**	OSMIUM TETROXIDE, MARINE POLLUTANT
· **IATA**	OSMIUM TETROXIDE

· **Transport hazard class(es)**

· **DOT**

· **Class**	6.1 Toxic substances
· **Label**	6.1

· **ADR, IATA**

· **Class:**	6.1 Toxic substances

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· **Label:**	6.1
· **IMDG**	
	
· **Class**	6.1 Toxic substances
· **Label**	6.1
· **Packing group**	
· **DOT, ADR, IMDG, IATA**	I
· **Environmental hazards**	
· **Marine pollutant:**	Yes (PP) Symbol (fish and tree)
· **Special precautions for user**	Warning: Toxic substances
· **Hazard identification number (Kemler code):**	66
· **EMS Number:**	F-A,S-A
· **Stowage Category**	B
· **Stowage Code**	SW2 Clear of living quarters.
· **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**	Not applicable.
· **Transport/Additional information:**	
· **DOT**	
· **Remarks:**	Special marking with the symbol (fish and tree).
· **ADR**	
· **Excepted quantities (EQ)**	Code: E5 Maximum net quantity per inner packaging: 1 g Maximum net quantity per outer packaging: 300 g
· **IMDG**	
· **Limited quantities (LQ)**	0
· **Excepted quantities (EQ)**	Code: E5 Maximum net quantity per inner packaging: 1 g Maximum net quantity per outer packaging: 300 g
· **UN "Model Regulation":**	UN 2471 OSMIUM TETROXIDE, 6.1, I

15 Regulatory information

· **Safety, health and environmental regulations/legislation specific for the substance or mixture**
No further relevant information available.
· **Section 355 (extremely hazardous substances):** Substance is not listed.
· **Section 313 (Specific toxic chemical listings):** Substance is listed.
· **TSCA (Toxic Substances Control Act):** ACTIVE
· **Hazardous Air Pollutants** Substance is not listed.
· **Proposition 65** Substance is not listed.
· **Chemicals known to cause cancer:** Substance is not listed.
· **Chemicals known to cause reproductive toxicity for females:** Substance is not listed.
· **Chemicals known to cause reproductive toxicity for males:** Substance is not listed.
· **Chemicals known to cause developmental toxicity:** Substance is not listed.

· **Cancerogenity categories**
· **EPA (Environmental Protection Agency)** Substance is not listed.
· **TLV (Threshold Limit Value)** Substance is not listed.

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· **NIOSH-Ca (National Institute for Occupational Safety and Health)** Substance is not listed.
· **GHS label elements**
The substance is classified and labeled according to the Globally Harmonized System (GHS).
· **Hazard pictograms** GHS05, GHS06
· **Signal word** Danger
· **Hazard statements**
Fatal if swallowed, in contact with skin or if inhaled.
Causes severe skin burns and eye damage.
· **Precautionary statements**
Do not breathe dust.
Wear protective gloves/protective clothing/eye protection/face protection.
If swallowed: Immediately call a poison center/doctor.
If on skin: Wash with plenty of soap and water.
IF INHALED: Remove person to fresh air and keep comfortable for breathing.
If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
Store in a well-ventilated place. Keep container tightly closed.
Store locked up.
Dispose of contents/container in accordance with local/regional/national/international regulations.
· **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

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.

· **Department issuing SDS:** Product Safety Department
· **Contact:** +49 6221 13840-35
· **Date of preparation / last revision** 09/23/2024 / -
· **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 (REACH)
vPvB: very persistent, very bioaccumulative substance (REACH)
REACH: Regulation concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals
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
DOT: US Department of Transportation
IATA: International Air Transport Association
PP: Severe Marine Pollutant
EINECS: European Inventory of Existing Commercial Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
PBT: Persistent, Bioaccumulative and Toxic
vPvB: very Persistent and very Bioaccumulative
NIOSH: National Institute for Occupational Safety
OSHA: Occupational Safety & Health
TLV: Threshold Limit Value
PEL: Permissible Exposure Limit
REL: Recommended Exposure Limit
Acute Toxicity - Oral 2: Acute toxicity – Category 2
Acute Toxicity - Dermal 1: Acute toxicity – Category 1
Skin Corrosion 1B: Skin corrosion/irritation – Category 1B