

Safety Data Sheet

Product No. 18450, 18451, 18456 Osmium Tetroxide Crystals

Issue Date (06-15-15)

Review Date (08-31-17)

Section 1: Product and Company Identification

Product Name: Osmium Tetroxide Crystals

Synonym: Osmic Acid, Osmium (VIII) Oxide, Osmic acid anhydride

Company Name

Ted Pella, Inc., P.O. Box 492477, Redding, CA 96049-2477

Inside USA and Canada 1-800-237-3526 (Mon-Thu. 6:00AM to 4:30PM PST; Fri 6:00AM to 4:00PM PST)

Outside USA and Canada 1-530-243-2200 (Mon-Thu. 6:00AM to 4:30PM PST; Fri 6:00AM to 4:00PM PST)

CHEMTREC USA and Canada Emergency Contact Number 1-800-424-9300 24 hours a day

CHEMTREC Outside USA and Canada Emergency Contact Number +1-703-741-5970 24 hours a day

Section 2: Hazard Identification

2.1 Classification of the substance or mixture

GHS Pictograms



GHS06



GHS07



GHS02

GHS Categories

Acute Tox. 1/2, Inhalation

H330: Fatal if inhaled.

Acute Tox. 1/2, Dermal

H310: Fatal in contact with skin.

Acute Tox. 1/2, Oral

H300: Fatal if swallowed.

Skin Corr. 1B

H314: Causes severe skin burns and eye damage.

Serious Eye Damage 1

H318: Causes serious eye damage.

Respiratory Sens. 1

H334: May cause allergy or asthma symptoms or breathing difficulties if inhaled.

2.2 Label elements

Hazard Pictograms



Signal Word: Danger

Hazard statements

H300 Fatal if swallowed.

H310 Fatal in contact with skin.

H314 Causes severe skin burns and eye damage.

H318 Causes serious eye damage.

H330 Fatal if inhaled.

H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.

Precautionary statements

P202	Do not handle until all safety precautions have been read and understood.
P210	Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P260	Do not breathe dust/fume/gas/mist/vapors/spray.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P284	Wear respiratory protection.
P302+P352	IF ON SKIN: Wash with 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 so. Continue rinsing.
P310	Immediately call a POISON CENTER or doctor/physician.

2.3 Other hazards

Other hazards which do not result in classification: Lachrymator.

OSHA Hazards: Oxidizing, Target Organ Effect, Highly toxic by inhalation, Highly toxic by ingestion, Highly toxic by skin absorption, Respiratory sensitizer, Corrosive

Health Effects:

NFPA Hazard Rating: Health: 4; Fire: 0; Reactivity: 3; Other: TOX

HMIS® Hazard Rating: Health: 4; Fire: 0; Reactivity: 3; Personal Protection: J

(0=least, 1=Slight, 2=Moderate, 3=High, 4=Extreme)

Results of PBT and vPvB assessment:

PBT: ND

vPvB: ND

Emergency overview

The substance can be absorbed into the body by inhalation of its vapors, by inhalation of its aerosol and by ingestion. A harmful contamination of air can be reached very quickly on evaporation of this substance at 20 °C. Contact with combustible material may cause fire.

Appearance: Colorless yellow solid

Immediate effects: ND

Potential health effects

Target Organs: Eyes, Central nervous system, Male reproductive system, Kidney

Primary Routes of entry: Eyes, skin, ingestion, and inhalation.

Signs and Symptoms of Overexposure:

Eye Hazards: Redness, pain, blurred vision, loss of vision, severe deep burns. Causes serious eye damage.

If eyes are exposed to vapor over a short period of time, night vision will be affected for about one evening.

One will notice colored halos around lights.

Skin hazards: Possible skin discoloration (green or black), redness, skin burns, pain, blisters. Causes serious skin damage. Very toxic in contact with the skin.

Ingestion Hazards: Abdominal cramps, burning sensation, shock or collapse. Very toxic if swallowed.

Inhalation Hazards: burning sensation, cough, headache, wheezing, shortness of breath, visual disturbances.

Symptoms may be delayed. Very toxic if inhaled.

Chronic Exposure: Repeated or prolonged contact with skin may cause dermatitis. The substance may cause effect on the kidney.

Chemical Listed As Carcinogen Or Potential Carcinogen: No

See Toxicological Information (Section 11)

Potential environmental effects

See Ecological Information (Section 12)

Section 3: Composition / Information on Ingredients

Principle Hazardous Component(s) (chemical and common name(s)) (Cas. No)	%	OSHA PEL mg/m3	ACGIH TLV mg/m3	NTP Carcinogen	IARC Carcinogen	OSHA regulated Carcinogen
Osmium Tetroxide/Osmium Oxide (20816-12-0) EC number: 244-058-7 Index number: 076-001-00-5	99.9	0.002	0.0002 ppm, 0.0016 mg/m3 TWA; 0.0006 ppm, 0.0047 mg/m3 STEL	No	No	No

IDLH: 1 mg/m3 as (Os)

Conversion: 1 ppm = 10.40 mg/m3

NIOSH: RTECS RN1140000

Section 4: First Aid Measures

If accidental overexposure is suspected

- Eye(s) Contact: Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses if present and easy to do. CONTACT A PHYSICIAN IMMEDIATELY.
- Skin Contact: Take off immediately all contaminated clothing. Rinse with water thoroughly. CONTACT A PHYSICIAN IMMEDIATELY
- Inhalation: Remove the victim from the contaminated area while protecting yourself from exposure by wearing an appropriate respirator. Put a similar respirator on the victim if possible. Get medical attention immediately.
- Ingestion: Rinse mouth. Seek immediate medical attention. Clear the airway and administer artificial respiration if not breathing. If swallowed, do not induce vomiting unless directed to do so by medical personnel. CONTACT A PHYSICIAN IMMEDIATELY.

Note to physician

Treatment: Observe for any symptoms for several hours after exposure.

Medical Conditions generally Aggravated by Exposure: Potential kidney damage.

Section 5: Fire Fighting Measures

Flash Point: NA

Flammable Limits: NA

Auto-ignition point: NA

Fire Extinguishing Media: Carbon dioxide, dry chemical powder, appropriate foam.

Special Fire Fighting Procedures: Use NIOSH/MSHA approved self-contained breathing apparatus with full face-piece operated in a pressure-demand or other positive pressure mode and full protective clothing.

Unusual Fire and Explosion Hazards: O₄Os is a strong oxidizer and may react explosively with many organic compounds. Risk of fire and explosion when mixed with combustible substances. No contact with flammable substances. Not combustible but enhances combustion of other substances. Emits toxic fumes under fire conditions.

Hazardous combustion products: ND

DOT Class: Toxic, Corrosive.

Section 6: Accidental Release Measures

Steps to be Taken in Case Material is Released or Spilled: Evacuate area immediately! Consult an expert. Use a NIOSH approved chemical cartridge respirator for acid gas and dust/mist/fume or self-contained breathing apparatus with full face shield for clean-up. Sweep spilled substance into containers and cap and move to fume hood. If appropriate, moisten first to prevent dusting then remove to safe place. Do not absorb in saw-dust or other combustible material. Do not let this chemical enter the environment (extra personal protective equipment with full protective equipment and self-contained breathing apparatus is a must).

Large spills: Contain actively spilling material if safe and easy to do so, avoid generating dust. Collect material and dispose.

Small spills: Sweep and collect to waste receptacles.

Waste Disposal Methods: Dispose of waste according to Federal, State and Local Regulations.

Section 7: Handling and Storage

Precautions to be taken in Handling and Storage.

Storage: Keep containers tightly closed. Store in a cool, dry place in a tightly closed container. Do not store directly on ground and store away from sources of ignition or flame.

Handling: Do not handle until all safety precautions have been read and understood. Use local exhaust ventilation. Avoid breathing dust. Avoid contact with eyes, skin and clothing. Avoid prolonged exposure. Wear appropriate PPE. Wash thoroughly after handling. If eyes are exposed to vapor over a short period of time, night vision will be affected for about one evening. Avoid breathing dust or solution spray. Avoid exposure to vapor. Avoid prolonged or repeated exposure. Keep container closed when not in use. Use only in closed systems.

Storage temperature: Store cool dry place.

Storage Pressure: NA

Section 8: Exposure Controls / Personal Protection

Engineering Controls

Ventilation required: Chemical fume hood; local exhaust; mechanical.

Personal Protection Equipment

Respiratory protection: 0.1 mg/m³ supplied air respirator with a full face piece, any self-contained breathing apparatus with a full face piece. Any chemical cartridge respirator with a high efficiency particulate filter with a full face piece and cartridges providing protection against osmic acid. Any air-purifying full face piece respirator (gas mask) with a chin style or front or back mounted canister providing protection against osmium tetroxide and having a high efficiency particulate filter. 1 mg/m³ any supplied air respirator with a full face piece and operated in a pressure-demand or other positive pressure mode.

Protective gloves: Chemical-resistant (Rubber/Neoprene) gloves

Skin protection: Lab coat/apron, flame and chemical resistant clothing.

Eye protection: Safety glasses with side shields or goggles or face shield.

Additional equipment: Eye wash, safety shower, and hygiene facilities for washing.

Exposure Guidelines

See Composition/Information on Ingredients (Section 3)

Section 9 Physical and Chemical Properties

Appearance and Physical State: Colorless-to-pale yellow solid.

Odor (threshold): Sharp, chlorine-like odor (ND)

Specific Gravity (H₂O=1): 4.9 g/cm³

Vapor Pressure (mm Hg): 7

Vapor Density (air=1): ND

Percent Volatile by volume: ND

Evaporation Rate (butyl acetate=1): ND

Boiling Point: 266.0 °F (130 °C)

Melting point: 107.6 °F (39.5-41.0 °C)

pH: NA as solid.

Solubility in Water: 6% @ 77 °F

Molecular Weight: 254.2

Section 10: Stability and Reactivity

Stability: Stable under proper storage condition.

Conditions to Avoid: Combustible Material, HCl and Oxidized Agents.

Materials to Avoid (Incompatibility): Strong reducing agents, organic materials, finely powdered metals, combustible material, and oxidized agents. Contact with hydrochloric acid will cause a formation of poisonous chlorine gas.

Hazardous Decomposition Products: Begins to sublime below boiling point and releases a poisonous and irritating vapor. Contact with other materials may cause fire.

Hazardous Polymerization: Will not occur.

Section 11: Toxicological Information

Results of component toxicity test performed:

Chronic Reproductive Effects:

Species: Rat

Dose: 20336 UMOL/L

Route of Application: Intratesticular

Exposure Time: (1D MALE)

Result (paternal effects): Spermatogenesis (including genetic material, sperm morphology, motility, and count). Testes, epididymis, sperm duct.

Species: Mouse

Dose: 20336 UMOL/L

Route of Application: Subcutaneous

Exposure Time: (30D MALE)

Result paternal effects: Spermatogenesis (including genetic material, sperm morphology, motility, and count). Testes, epididymis, sperm duct.

Chronic mutagenicity (genetic effects):

Species: Hamster

Dose: 200 UMOL/L

Cell type: Embryo

Mutation test: Unscheduled DNA synthesis.

Intraperitoneal

Species (Rat): 14100 UG/KG, LD50

Oral LD50

Species (Mouse): 162 mg/kg

Human experience: ND

This product **does not** contain any compounds listed by NTP or IARC or regulated by OSHA as a carcinogen.

Section 12: Ecological Information

Ecological Information: Toxicity - Aquatic and Terrestrial plants: Product not tested. This substance may be hazardous to the environment; special attention should be given to crustacea.

Chemical Fate Information: ND

Section 13 Disposal Considerations

RCRA 40 CFR 261 Classification: OsO₄ is a listed EPA Hazardous Waste - P087.

Consult Federal EPA, State and local regulations for proper disposal/recycle/reclamation.

Treat empty containers with extra care. Consult waste contractor.

NOTE: Chemical additions, processing, or otherwise altering this material may make the waste management information presented above incomplete, inaccurate, or otherwise inappropriate.

Federal, State and local laws governing disposal of materials can differ. Ensure proper disposal compliance with proper authorities before disposal.

Section 14: Transportation Information

US DOT Information: Proper shipping name: Osmium Tetroxide

Hazard Class: 6.1

Packing group: I

UN Number: UN2471

IATA: Proper shipping name: Osmium Tetroxide

Hazard Class: 6.1

Packing group: I

UN Number: UN2741

Always consult IATA manual before shipping.

IMO: Proper shipping name: Osmium Tetroxide

Hazard Class: 6.1

Packing group: I

UN Number: UN2471

Marine Pollutant: Yes, PP

Canadian TDG: Proper shipping name: Osmium Tetroxide

Section 15: Regulatory Information

United States Federal Regulations

SDS complies with OSHA's Hazard Communication Rule 29, CFR 1910.1200.

SARA: Acute Health Hazard, Chronic Health Hazard

SARA Title III: Section 313 Form "R"/TRI Reportable Chemical. This compound is subject to the reporting requirements of SARA Section 313.

RCRA: Number: P087

TSCA: This Chemical is TSCA listed and is also cGMP under FDA for IVD testing.

CERCLA: Osmium Tetroxide/Osmium Oxide (20816-12-0): RQ = 1000 lbs (454 Kg)

State Regulations

California Proposition 65: This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

Massachusetts Right To Know Components: Osmic Acid CAS-No. 20816-12-0

Pennsylvania Right To Know Components: Osmic Acid CAS-No. 20816-12-0

New Jersey Right To Know Components: Osmic Acid CAS-No. 20816-12-0

International Regulations

A Chemical Safety Assessment has not been carried out.

Canada WHMIS: This product has been classified in accordance with the hazard criteria of CPR, and the SDS contains all the information required by the CPR.

DSL: Yes

NDSL: No

Europe EINECS Numbers: 244-058-7

Section 16: Other Information

Label Information: Oxidizer, Target Organ Effect, Highly toxic by inhalation, Highly toxic by ingestion, Highly toxic by skin absorption, Respiratory sensitizer, Corrosive.

European Risk and Safety Phrases:

Symbol of danger: Very Toxic (T+)

Risk #: 26/27/28-34

Risk phrases: Very toxic by inhalation, in contact with skin and if swallowed. Causes burns.

Safety #: 7/9-26-45

Safety phrases: Keep container tightly closed and in well-ventilated place. In case of contact with eyes, rinse immediately with water and seek medical advice. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

European symbols needed: Very Toxic, Oxidizing

Canadian WHMIS Symbols:

Abbreviations used in this document

NE= Not established

NA= Not applicable

NIF= No Information Found

ND= No Data

Disclaimer

Ted Pella, Inc. makes no warranty of any kind regarding the information furnished herein. Users should independently determine the suitability and completeness of information from all sources. While this data is presented in good faith and believed to be accurate, it should be considered only as a supplement to other information gathered by the user. It is the User's responsibility to assure the proper use and disposal of these materials as well as the safety and health of all personnel who may work with or otherwise come in contact with these materials.

SDS Form 0013F1V4