Material Safety Data Sheet
Potassium Permanganate

IDENTIFICATION SECTION

Product Name: Potassium Permanganate
Other Names: Permanganic Acid, Potassium Salt
Product Code: C364
U.N. Number: UN1490
Dangerous Goods Class: 5.1
Subsidiary Risk: None allocated
Packing Group: II
Poison Schedule: None allocated
Use: Fixative and stain in microscopy

Physical Description and Properties

Appearance: Dark purple to bronze crystals with no odor

- Boiling Point/Melting Point: Decomposes at approximately 150°C
- Vapor Pressure: Practically zero
- Specific Gravity: 2.70 at 15°C
- Flash Point: Assists combustion
- Flammability Limits: No data
- Solubility in Water: 6.4g/100ml @ 20°C

Other Properties:

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Chemical Name</th>
<th>CAS Number</th>
<th>Proportion</th>
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<tr>
<td>KMnO₄</td>
<td>7722-64-7</td>
<td>100%</td>
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HEALTH HAZARD INFORMATION

Target organs: Respiratory system, central nervous system, blood, kidneys.

Acute:
Swallowed: The fatal oral dose is estimated to be about 10g. Death may occur up to one month from of poisoning. Swelling and irritation of the tissues in the mouth and throat, nausea and vomiting may occur after swallowing solid permanganate or concentrated solutions. A high-pitched noisy breathing (strider), slow pulse, shock and fall of blood pressure can occur. Liver and kidney may develop.

Eye: Strong solutions and crystals can cause severe eye damage. Usually where the chemical touches the eye, a hardened, ulcer-like, dark brown colored injury develops. Swelling of the eyelids and the tender tissues surrounding the eye (conjunctiva) and bleeding can occur. With prolonged contact, cloudiness and brown discoloration of the front part of the eye (cornea) can result. Recovery is usually complete, but in severe cases, permanent damage such as a dense, white cloudiness of the cornea may occur. Dilute solutions are mildly irritating.

Skin: Concentrated solutions and the solid are highly corrosive. Contact with the skin can produce a burn with a thick, brownish-purple area of dead tissue. Dilute solutions cause mild irritation.

Inhaled: High concentration of potassium permanganate dust or mist (solutions) may cause irritation of the nose, throat and respiratory tract with symptoms such as sore throat, coughing, shortness of breath and difficult breathing. Extreme exposures could result in a build-up of fluids in the lungs (pulmonary oedema) that might be fatal in severe cases. Symptoms of pulmonary oedema, such as difficult breathing, may not appear until several hours after exposure.

Chronic: Chronic intake of manganese compounds by ingestion or inhalation can result in harmful effects on the central nervous system. Symptoms could include difficulty in walking, weakness or cramps in the legs, trouble with memory, judgments and unstable emotions.

First Aid:
Swallowed: Never give anything by mouth if victim is rapidly losing consciousness, or is unconscious or convulsing. Have victim rinse mouth thoroughly with water. Do not induce vomiting. Have victim drink 240-300mL of water. If vomiting occurs naturally, have victim lean forward to reduce risk of aspiration. Repeat transport victim to an emergency facility.

Eye: Immediately flush the contaminated eye(s) with gently flowing water for 20 minutes, by the clock, holding the eyelid(s) open. Take care not to rinse the contaminated water into non-affected eye. If irritation persists, repeat flushing. Obtain medical attention immediately.

Skin: Avoid direct contact with this chemical. As quickly as possible flush contaminated area with gently running water for at least 20 minutes, by the clock. Under running water remove contaminated clothing, shoes, and leather goods. If irritation persists, repeat flushing. Obtain medial advice immediately.

Inhaled: Remove source of contamination or move victim to fresh air. Obtain medical advice immediately.

First Aid Facilities: Eye bath, safety shower.
Advice to Doctor: Treat symptomatically.
**PRECAUTIONS FOR USE**

**Exposure Standards:**
- OSHA Permissible Exposure Limit (PEL): 5mg/m³ Ceiling for manganese compounds as Mn
- ACGIH Threshold Limit Value (TLV): 0.2mg/m³ (TWA) for manganese, elemental and inorganic compounds as Mn

**Engineering Controls:**
Use local exhaust ventilation, and process enclosure if necessary, to control airborne dust and mist. Use a corrosion resistant separate from other exhaust ventilation systems. Exhaust directly to the outside. Locate dust collectors outside or where permitted by regulation. Provide dust collectors with explosion vents. Do not use combustible or organic materials such as wood in the construction of ventilation systems and other engineering controls.

**Personal Protection:**
- **Respiratory Protection:** None required where adequate ventilation conditions exist. If airborne concentration exceeds TLV, a dust/mist respirator is recommended. If concentration exceeds capacity of respirator, a self-contained breathing apparatus is advised.
- **Eye protection:** Chemical safety goggles. A face shield may also be necessary.
- **Skin protection:** Impervious gloves, coveralls, boots and/or other resistant protective clothing.
- **Note:** Contaminated clothing may be a fire hazard.

**Flammability:**
Not combustible but assists combustion of other substances.

**SAFE HANDLING INFORMATION**

**Storage and Transport:**
Keep container tightly closed. Store in a cool, dry, well ventilated area, out of direct sunlight. Store separately and away from flammable and combustible materials, reducing material and strong acids. Keep from contact with clothing. Limit quantity of material in strong area.

Transport: This material is classified as Class 5.1 Dangerous Good according to the Australian code for the transport of Dangerous Goods.

Proper shipping name: Potassium Permanganate. EPG Number 5A1. Packaging method 5.9.5.1.

**Spills and Disposal:**
Precautions: Restrict access to area until completion of clean-up. Ensure clean-up is conducted by trained personnel only. Wear adequate personal protective equipment. Ventilate area. Remove or isolate flammable and combustible materials.

Clean up: Do not touch spilled material. Prevent material from entering sewers or confined spaces. Keep materials which can burn away from spilled materials. Stop or reduce leak if safe to do so. Contain spill with earth, sand or absorbent material which does not react with spilled material. Small spills of solution: Soak up spill with absorbent labeled containers. Flush area with water. Shovel spilled solid into clean, dry, labeled containers and cover. Flush area with water. Large spills: Contact fire and emergency services and supplier for advice. Contaminated absorbent material may pose the same hazard as the spilled product.
SAFE HANDLING INFORMATION - continued

Disposal: Review federal, state, and local government requirements prior to disposal. Store material for disposal as indicated in storage conditions. Note: Waste potassium permanganate can be converted to a less hazardous material by weak reducing agents such as hypo (sodium thiosulfate), bisulphites or ferrous salts followed by neutralization with soda ash or dilute HCl. Contact chemical manufacturer/supplier for advice. Treatment of water material must be done equipment. Disposal secure landfill may be acceptable.

Fire/Explosion Hazard:

NFPA Ratings: Health: 1 Flammability: 0 Reactivity: 0 Other: Oxidizer

Potassium Permanganate is an oxidizing material that will increase the burning rate or which may cause spontaneous ignition of combustible material with which it comes in contact.

Fire extinguishing agent: Water. Very large amounts of water may be needed.

Combustion products: When heated, potassium permanganate gives off oxygen which increases the fire hazard.

OTHER INFORMATION

Incompatibilities: Organic materials, combustible materials, strong reducing agents, strong acids, peroxides, chemically active metals.

(Materials to avoid)

Animal Toxicity Data: LD50 (Oral Rate) – 780mg/kg male (14 days); 525 mg/kg female (14 days).

The information published in this Material Safety Data Sheet has been compiled from data in various technical publications. It is the user’s responsibility to determine the suitability of this information for adoption of necessary safety precautions. We reserve the right to revise Material Safety Data Sheets as new information becomes available. Copies may be made for non-profit use.