



# POTASSIUM PERMANGANATE

## ALPHA CHEMICALS PTY LTD

Chemwatch Hazard Alert Code: 3

Chemwatch: 1490  
Version No: 11.1.1.1  
Safety Data Sheet according to WHS and ADG requirements

Issue Date: 19/10/2019  
Print Date: 17/09/2020  
S.GHS.AUS.EN

### SECTION 1 Identification of the substance / mixture and of the company / undertaking

#### Product Identifier

Product name	POTASSIUM PERMANGANATE
Chemical Name	potassium permanganate
Synonyms	Mn-O4.K; KMnO4; Cairox; chameleon mineral; Condy's crystals; permanganic acid, potassium salt; permanganate of potash; purple salt; C.I. 77755; formaldehyde activator; APS AR00000414 TECH00004459 M-F00011080; UL00000415 BP00004446 USP00005769 TECH00005770; Product Code: 10217; Cat. No. 10217-29644-29837
Proper shipping name	POTASSIUM PERMANGANATE
Chemical formula	KMnO4
Other means of identification	Not Available
CAS number	7722-64-7

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

Relevant identified uses	Bleaching of waxes, fats, oils, straw, cotton, silk, chamois, other fibres Dyeing wood brown; printing fabrics; photography; tanning leathers. Disinfection; deodoriser, algaecide for water treatment, an agent for medical treatment for some poisons; an important reagent in analytical and organic chemistry. Formaldehyde activator In poultry shed cleanout sanitation [-Regeant -]
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#### Details of the supplier of the safety data sheet

Registered company name	ALPHA CHEMICALS PTY LTD
Address	4 ALLEN PLACE WETHERILL PARK NSW 2099 Australia
Telephone	61 (0)2 9982 4622
Fax	Not Available
Website	~
Email	shane@alphachem.com.au

#### Emergency telephone number

Association / Organisation	ALPHA CHEMICALS PTY LTD
Emergency telephone numbers	61 (0)418 237 771
Other emergency telephone numbers	Not Available

### SECTION 2 Hazards identification

#### Classification of the substance or mixture

**HAZARDOUS CHEMICAL. DANGEROUS GOODS. According to the WHS Regulations and the ADG Code.**

#### ChemWatch Hazard Ratings

	Min	Max	
Flammability	0		
Toxicity	2		
Body Contact	3		
Reactivity	2		
Chronic	2		

0 = Minimum  
1 = Low  
2 = Moderate  
3 = High  
4 = Extreme

Poisons Schedule	S6
Classification [1]	Oxidizing Solid Category 2, Acute Toxicity (Oral) Category 4, Chronic Aquatic Hazard Category 1, Reproductive Toxicity Category 2, Specific target organ toxicity - repeated exposure Category 2, Eye Irritation Category 2A
Legend:	1. Classified by Chemwatch; 2. Classification drawn from HCIS; 3. Classification drawn from Regulation (EU) No 1272/2008 - Annex VI

#### Label elements

POTASSIUM PERMANGANATE

Hazard pictogram(s)	
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Signal word	<b>Danger</b>
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**Hazard statement(s)**

H272	May intensify fire; oxidiser.
H302	Harmful if swallowed.
H410	Very toxic to aquatic life with long lasting effects.
H361fd	Suspected of damaging fertility. Suspected of damaging the unborn child.
H373	May cause damage to organs through prolonged or repeated exposure.
H319	Causes serious eye irritation.

**Precautionary statement(s) Prevention**

P201	Obtain special instructions before use.
P210	Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
P221	Take any precaution to avoid mixing with combustibles/organic material.
P260	Do not breathe dust/fume.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P220	Keep/Store away from clothing/organic material/combustible materials.
P270	Do not eat, drink or smoke when using this product.
P273	Avoid release to the environment.

**Precautionary statement(s) Response**

P308+P313	IF exposed or concerned: Get medical advice/attention.
P370+P378	In case of fire: Use water jets for extinction.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P314	Get medical advice/attention if you feel unwell.
P337+P313	If eye irritation persists: Get medical advice/attention.
P391	Collect spillage.
P301+P312	IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.
P330	Rinse mouth.

**Precautionary statement(s) Storage**

P405	Store locked up.
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**Precautionary statement(s) Disposal**

P501	Dispose of contents/container to authorised hazardous or special waste collection point in accordance with any local regulation.
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**SECTION 3 Composition / information on ingredients**

**Substances**

CAS No	%[weight]	Name
7722-64-7	>99	<u>potassium permanganate</u>

**Mixtures**

See section above for composition of Substances

**SECTION 4 First aid measures**

**Description of first aid measures**

Eye Contact	<p>If this product comes in contact with the eyes:</p> <ul style="list-style-type: none"> <li>▶ Immediately hold eyelids apart and flush the eye continuously with running water.</li> <li>▶ Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.</li> <li>▶ Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes.</li> <li>▶ Transport to hospital or doctor without delay.</li> <li>▶ Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.</li> </ul>
Skin Contact	<p>If skin or hair contact occurs:</p> <ul style="list-style-type: none"> <li>▶ Immediately flush body and clothes with large amounts of water, using safety shower if available.</li> <li>▶ Quickly remove all contaminated clothing, including footwear.</li> <li>▶ Wash skin and hair with running water. Continue flushing with water until advised to stop by the Poisons Information Centre.</li> </ul>

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	<ul style="list-style-type: none"> <li>Transport to hospital, or doctor.</li> </ul>
Inhalation	<ul style="list-style-type: none"> <li>If fumes or combustion products are inhaled remove from contaminated area.</li> <li>Lay patient down. Keep warm and rested.</li> <li>Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.</li> <li>Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary.</li> <li>Transport to hospital, or doctor, without delay.</li> </ul>
Ingestion	<ul style="list-style-type: none"> <li><b>IF SWALLOWED, REFER FOR MEDICAL ATTENTION, WHERE POSSIBLE, WITHOUT DELAY.</b></li> <li>For advice, contact a Poisons Information Centre or a doctor.</li> <li>Urgent hospital treatment is likely to be needed.</li> <li>In the mean time, qualified first-aid personnel should treat the patient following observation and employing supportive measures as indicated by the patient's condition.</li> <li>If the services of a medical officer or medical doctor are readily available, the patient should be placed in his/her care and a copy of the SDS should be provided. Further action will be the responsibility of the medical specialist.</li> <li>If medical attention is not available on the worksite or surroundings send the patient to a hospital together with a copy of the SDS.</li> </ul> <p><b>Where medical attention is not immediately available or where the patient is more than 15 minutes from a hospital or unless instructed otherwise:</b></p> <ul style="list-style-type: none"> <li><b>INDUCE</b> vomiting with fingers down the back of the throat, <b>ONLY IF CONSCIOUS</b>. Lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.</li> </ul> <p><b>NOTE:</b> Wear a protective glove when inducing vomiting by mechanical means.</p>

**Indication of any immediate medical attention and special treatment needed**

For inorganic permanganate poisoning:

Oral Management

- NO GASTRIC LAVAGE OR EMETIC
- Encourage oral fluids, unless perforation is suspected
- Emergency tracheostomy may be necessary
- Give plasma expanders/blood or IV fluids for shock and analgesics for pain
- Consider the use of steroids to reduce the inflammatory response
- Take abdominal X-ray to check for perforation
- If facilities are available, early gastro-oesophagoscopy should be undertaken within 12 hours of the event to assess the extent and severity of the injury
- Symptomatic and supportive care
- Early administration of N-acetylcysteine in the same dose as used in paracetamol poisoning has been postulated as an antidote for oral exposure, but its efficacy has not been proven
- Long-term follow-up is necessary following severe oral exposure due to sequelae

Whole blood manganese concentration can be used as an indicator of oral exposure in severe cases as the concentration remains elevated for more than five days post ingestion

Inhalation Management

- Maintain a clear airway, give humidified oxygen and ventilate if necessary
- If respiratory irritation occurs assess respiratory function and if necessary perform chest X-rays to check for chemical pneumonitis
- Consider the use of steroids to reduce the inflammatory response
- Treat pulmonary oedema with PEEP or CPAP ventilation

Dermal Management

- Remove any remaining contaminated clothing, place in double, sealed, clear bags and label; store in a secure area away from patients and staff
- Irrigate with copious amounts of water
- Skin burns should be treated as a thermal injury

Eye Management

- Irrigate thoroughly with running water or saline for 15 minutes
- Stain with fluorescein and refer to an ophthalmologist if there is any uptake of the stain

The Chemical Incident Management Handbook

Both dermal and oral toxicity of manganese salts is low because of limited solubility of manganese. No known permanent pulmonary sequelae develop after acute manganese exposure. Treatment is supportive.

[Ellenhorn and Barceloux: Medical Toxicology]

In clinical trials with miners exposed to manganese-containing dusts, L-dopa relieved extrapyramidal symptoms of both hypo kinetic and dystonic patients. For short periods of time symptoms could also be controlled with scopolamine and amphetamine. BAL and calcium EDTA prove ineffective.

[Gosselin et al: Clinical Toxicology of Commercial Products.]

**SECTION 5 Firefighting measures**

**Extinguishing media**

FOR SMALL FIRE:

- USE FLOODING QUANTITIES OF WATER.
- DO NOT** use dry chemical, CO2, foam or halogenated-type extinguishers.

FOR LARGE FIRE

- Flood fire area with water from a protected position

**Special hazards arising from the substrate or mixture**

Fire Incompatibility	<ul style="list-style-type: none"> <li>Avoid storage with reducing agents.</li> <li>Avoid any contamination of this material as it is very reactive and any contamination is potentially hazardous</li> </ul>
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**Advice for firefighters**

Fire Fighting	<ul style="list-style-type: none"> <li>Alert Fire Brigade and tell them location and nature of hazard.</li> <li>May be violently or explosively reactive.</li> <li>Wear breathing apparatus plus protective gloves.</li> <li>Prevent, by any means available, spillage from entering drains or water course.</li> <li>Fight fire from a safe distance, with adequate cover.</li> </ul>
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	<ul style="list-style-type: none"> <li>▶ Extinguishers should be used only by trained personnel.</li> <li>▶ Use water delivered as a fine spray to control fire and cool adjacent area.</li> <li>▶ Avoid spraying water onto liquid pools.</li> </ul>
<b>Fire/Explosion Hazard</b>	<p>Decomposes on heating and produces oxygen, oxides of manganese and alkaline oxides of potassium.</p> <ul style="list-style-type: none"> <li>▶ Will not burn but increases intensity of fire.</li> <li>▶ Heating may cause expansion or decomposition leading to violent rupture of containers.</li> <li>▶ Heat affected containers remain hazardous.</li> <li>▶ Contact with combustibles such as wood, paper, oil or finely divided metal may produce spontaneous combustion or violent decomposition.</li> <li>▶ May emit irritating, poisonous or corrosive fumes.</li> </ul> <p>Decomposition may produce toxic fumes of: metal oxides</p>
<b>HAZCHEM</b>	1Y

**SECTION 6 Accidental release measures**

**Personal precautions, protective equipment and emergency procedures**

See section 8

**Environmental precautions**

See section 12

**Methods and material for containment and cleaning up**

<b>Minor Spills</b>	<ul style="list-style-type: none"> <li>▶ Clean up all spills immediately.</li> <li>▶ No smoking, naked lights, ignition sources.</li> <li>▶ Avoid all contact with any organic matter including fuel, solvents, sawdust, paper or cloth and other incompatible materials, as ignition may result.</li> <li>▶ Avoid breathing dust or vapours and all contact with skin and eyes.</li> <li>▶ Control personal contact with the substance, by using protective equipment.</li> <li>▶ Contain and absorb spill with dry sand, earth, inert material or vermiculite.</li> <li>▶ <b>DO NOT use sawdust as fire may result.</b></li> <li>▶ Scoop up solid residues and seal in labelled drums for disposal.</li> </ul> <p>66mno4</p>
<b>Major Spills</b>	<ul style="list-style-type: none"> <li>▶ Clear area of personnel and move upwind.</li> <li>▶ Alert Fire Brigade and tell them location and nature of hazard.</li> <li>▶ May be violently or explosively reactive.</li> <li>▶ Wear breathing apparatus and protective gloves.</li> <li>▶ Prevent, by any means available, spillage from entering drains or water courses.</li> <li>▶ No smoking, flames or ignition sources.</li> <li>▶ Increase ventilation.</li> <li>▶ Contain spill with sand, earth or other clean, inert materials.</li> </ul>

Personal Protective Equipment advice is contained in Section 8 of the SDS.

**SECTION 7 Handling and storage**

**Precautions for safe handling**

<b>Safe handling</b>	<p>For oxidisers, including peroxides.</p> <ul style="list-style-type: none"> <li>-Avoid personal contact and inhalation of dust, mist or vapours.</li> <li>-Provide adequate ventilation.</li> <li>-Always wear protective equipment and wash off any spillage from clothing.</li> <li>-Keep material away from light, heat, flammables or combustibles.</li> <li>-Keep cool, dry and away from incompatible materials.</li> <li>-Avoid physical damage to containers.</li> <li>-<b>DO NOT repack or return unused portions to original containers.</b></li> </ul>
<b>Other information</b>	<ul style="list-style-type: none"> <li>▶ Store in original containers.</li> <li>▶ Keep containers securely sealed as supplied.</li> <li>▶ Store in a cool, well ventilated area.</li> <li>▶ Keep dry.</li> <li>▶ Store under cover and away from sunlight.</li> <li>▶ Store away from flammable or combustible materials, debris and waste. Contact may cause fire or violent reaction.</li> <li>▶ Store away from incompatible materials and foodstuff containers.</li> </ul> <p>In addition, Goods of Class 5.1, packing group II should be:</p> <ul style="list-style-type: none"> <li>▶ stored in piles so that</li> <li>▶ the height of the pile does not exceed 1 metre</li> <li>▶ the maximum quantity in a pile or building does not exceed 1000 tonnes unless the area is provided with automatic fire extinguishers</li> <li>▶ the maximum height of a pile does not exceed 3 metres where the room is provided with automatic fire extinguishers or 2 meters if not.</li> <li>▶ the minimum distance between piles is not less than 2 metres where the room is provided with automatic fire extinguishers or 3 meters if not.</li> <li>▶ the minimum distance to walls is not less than 1 metre.</li> </ul>

**Conditions for safe storage, including any incompatibilities**

<b>Suitable container</b>	<ul style="list-style-type: none"> <li>▶ Glass container is suitable for laboratory quantities</li> <li>▶ <b>DO NOT repack.</b> Use containers supplied by manufacturer only.</li> </ul> <p>For low viscosity materials</p> <ul style="list-style-type: none"> <li>▶ Drums and jerricans must be of the non-removable head type.</li> <li>▶ Where a can is to be used as an inner package, the can must have a screwed enclosure.</li> </ul> <p>For materials with a viscosity of at least 2680 cSt. (23 deg. C) and solids:</p> <ul style="list-style-type: none"> <li>▶ Removable head packaging and</li> <li>▶ cans with friction closures may be used.</li> </ul> <p>-</p>
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	<p>Where combination packages are used, and the inner packages are of glass, there must be sufficient inert cushioning material in contact with inner and outer packages *.</p> <p>-</p> <p>In addition, where inner packagings are glass and contain liquids of packing group I and II there must be sufficient inert absorbent to absorb any spillage *.</p> <p>-</p> <p>* unless the outer packaging is a close fitting moulded plastic box and the substances are not incompatible with the plastic.</p>
<p><b>Storage incompatibility</b></p>	<p>Derivative of electropositive metal.</p> <ul style="list-style-type: none"> <li>▶ Segregate permanganates from concentrated acids, tin, sulfur, alcohol, peroxides, bromides, iodides, arsenates, glycols, ammonium compounds, metallic powders, phosphorous, hydrazine, ferrous or mercury salts, oxalates and combustible materials and organic substances generally.</li> <li>▶ Permanganates may reacts vigorously with metallic powders, ammonium compounds, phosphorous, carbon, arsenates, ethylene glycol, sulfur, hydrazine, metal hydrides, peroxides, alcohol and other combustible materials.</li> <li>▶ Permanganates may reacts violently when exposed to sulfuric acid or hydrogen peroxide.</li> <li>▶ May form explosive compounds with ammonium compounds, cellulose (such as cotton, paper).</li> <li>▶ Permanganates are readily decomposed by many reducing substances such as ferrous or mercury salts, iodides, bromides, oxalates, etc., especially in the presence of an acid.</li> <li>▶ Permanganates reacts with concentrated acids to produce oxygen and with hydrochloric acid to produce chlorine.</li> <li>▶ May cause spontaneous ignition if mixed with glycol anti-freeze compounds</li> <li>▶ Inorganic peroxy compounds are potent oxidisers that pose fire or explosive hazards when in contact with ordinary combustible materials.</li> <li>▶ Inorganic peroxides react with organic compounds to generate organic peroxide and hydroperoxide products that react violently with reducing agents.</li> <li>▶ Inorganic oxidising agents can react with reducing agents to generate heat and products that may be gaseous (causing pressurization of closed containers). The products may themselves be capable of further reactions (such as combustion in the air).</li> <li>▶ Organic compounds in general have some reducing power and can in principle react with compounds in this class. Actual reactivity varies greatly with the identity of the organic compound.</li> <li>▶ Inorganic oxidising agents can react violently with active metals, cyanides, esters, and thiocyanates.</li> <li>▶ Peroxides, in contact with inorganic cobalt and copper compounds, iron and iron compounds, acetone, metal oxide salts and acids and bases can react with rapid, uncontrolled decomposition, leading to fires and explosions.</li> <li>▶ Inorganic reducing agents react with oxidizing agents to generate heat and products that may be flammable, combustible, or otherwise reactive. Their reactions with oxidizing agents may be violent.</li> <li>▶ Incidents involving interaction of active oxidants and reducing agents, either by design or accident, are usually very energetic and examples of so-called redox reactions.</li> <li>▶ Contact with acids produces toxic fumes</li> <li>▶ WARNING: Avoid or control reaction with peroxides. All <i>transition metal</i> peroxides should be considered as potentially explosive. For example transition metal complexes of alkyl hydroperoxides may decompose explosively.</li> <li>▶ The pi-complexes formed between chromium(0), vanadium(0) and other transition metals (haloarene-metal complexes) and mono- or poly-fluorobenzene show extreme sensitivity to heat and are explosive.</li> <li>▶ Avoid reaction with borohydrides or cyanoborohydrides</li> <li>▶ Metals and their oxides or salts may react violently with chlorine trifluoride and bromine trifluoride.</li> <li>▶ These trifluorides are hypergolic oxidisers. They ignite on contact (without external source of heat or ignition) with recognised fuels - contact with these materials, following an ambient or slightly elevated temperature, is often violent and may produce ignition.</li> <li>▶ The state of subdivision may affect the results.</li> <li>▶ Avoid any contamination of this material as it is very reactive and any contamination is potentially hazardous</li> <li>▶ Avoid storage with reducing agents.</li> </ul>

**SECTION 8 Exposure controls / personal protection**

**Control parameters**

**Occupational Exposure Limits (OEL)**

**INGREDIENT DATA**


Source	Ingredient	Material name	TWA	STEL	Peak	Notes
Australia Exposure Standards	potassium permanganate	Manganese, dust & compounds (as Mn)	1 mg/m3	Not Available	Not Available	Not Available

**Emergency Limits**

Ingredient	Material name	TEEL-1	TEEL-2	TEEL-3
potassium permanganate	Potassium permanganate	8.6 mg/m3	14 mg/m3	150 mg/m3

Ingredient	Original IDLH	Revised IDLH
potassium permanganate	500 mg/m3	Not Available

**Exposure controls**

<p><b>Appropriate engineering controls</b></p>	<p>Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection. The basic types of engineering controls are:</p> <p>Process controls which involve changing the way a job activity or process is done to reduce the risk.</p> <p>Enclosure and/or isolation of emission source which keeps a selected hazard "physically" away from the worker and ventilation that strategically "adds" and "removes" air in the work environment. Ventilation can remove or dilute an air contaminant if designed properly. The design of a ventilation system must match the particular process and chemical or contaminant in use.</p> <p>Employers may need to use multiple types of controls to prevent employee overexposure.</p> <p>Local exhaust ventilation usually required.</p>
<p><b>Personal protection</b></p>	

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<b>Eye and face protection</b>	<ul style="list-style-type: none"> <li>▶ Safety glasses with unperforated side shields may be used where continuous eye protection is desirable, as in laboratories; spectacles are not sufficient where complete eye protection is needed such as when handling bulk-quantities, where there is a danger of splashing, or if the material may be under pressure.</li> <li>▶ Chemical goggles whenever there is a danger of the material coming in contact with the eyes; goggles must be properly fitted.</li> <li>▶ Full face shield (20 cm, 8 in minimum) may be required for supplementary but never for primary protection of eyes; these afford face protection.</li> <li>▶ Alternatively a gas mask may replace splash goggles and face shields.</li> <li>▶ Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lenses or restrictions on use, should be created for each workplace or task. This should include a review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience. Medical and first-aid personnel should be trained in their removal and suitable equipment should be readily available.</li> </ul>
<b>Skin protection</b>	See Hand protection below
<b>Hands/feet protection</b>	<ul style="list-style-type: none"> <li>▶ Elbow length PVC gloves</li> </ul> <p>The selection of suitable gloves does not only depend on the material, but also on further marks of quality which vary from manufacturer to manufacturer. Where the chemical 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.</p> <p>The exact break through time for substances has to be obtained from the manufacturer of the protective gloves and has to be observed when making a final choice.</p> <p>Personal hygiene is a key element of effective hand care. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturiser is recommended.</p> <p>Suitability and durability of glove type is dependent on usage.</p> <ul style="list-style-type: none"> <li>▶ <b>DO NOT wear cotton or cotton-backed gloves.</b></li> <li>▶ <b>DO NOT wear leather gloves.</b></li> <li>▶ Promptly hose all spills off leather shoes or boots or ensure that such footwear is protected with PVC over-shoes.</li> </ul>
<b>Body protection</b>	See Other protection below
<b>Other protection</b>	<ul style="list-style-type: none"> <li>▶ Overalls.</li> <li>▶ PVC Apron.</li> <li>▶ PVC protective suit may be required if exposure severe.</li> <li>▶ Eyewash unit.</li> <li>▶ Ensure there is ready access to a safety shower.</li> <li>▶ Some plastic personal protective equipment (PPE) (e.g. gloves, aprons, overshoes) are not recommended as they may produce static electricity.</li> <li>▶ For large scale or continuous use wear tight-weave non-static clothing (no metallic fasteners, cuffs or pockets).</li> <li>▶ Non sparking safety or conductive footwear should be considered. Conductive footwear describes a boot or shoe with a sole made from a conductive compound chemically bound to the bottom components, for permanent control to electrically ground the foot an shall dissipate static electricity from the body to reduce the possibility of ignition of volatile compounds. Electrical resistance must range between 0 to 500,000 ohms. Conductive shoes should be stored in lockers close to the room in which they are worn. Personnel who have been issued conductive footwear should not wear them from their place of work to their homes and return.</li> </ul>

**Respiratory protection**

Particulate. (AS/NZS 1716 & 1715, EN 143:2000 & 149:001, ANSI Z88 or national equivalent)

Required Minimum Protection Factor	Half-Face Respirator	Full-Face Respirator	Powered Air Respirator
up to 10 x ES	P1 Air-line*	-	PAPR-P1 -
up to 50 x ES	Air-line**	P2	PAPR-P2
up to 100 x ES	-	P3	-
		Air-line*	-
100+ x ES	-	Air-line**	PAPR-P3

\* - Negative pressure demand \*\* - Continuous flow

A(All classes) = Organic vapours, B AUS or B1 = Acid gasses, B2 = Acid gas or hydrogen cyanide(HCN), B3 = Acid gas or hydrogen cyanide(HCN), E = Sulfur dioxide(SO2), G = Agricultural chemicals, K = Ammonia(NH3), Hg = Mercury, NO = Oxides of nitrogen, MB = Methyl bromide, AX = Low boiling point organic compounds(below 65 degC)

- ▶ Respirators may be necessary when engineering and administrative controls do not adequately prevent exposures.
- ▶ The decision to use respiratory protection should be based on professional judgment that takes into account toxicity information, exposure measurement data, and frequency and likelihood of the worker's exposure - ensure users are not subject to high thermal loads which may result in heat stress or distress due to personal protective equipment (powered, positive flow, full face apparatus may be an option).
- ▶ Published occupational exposure limits, where they exist, will assist in determining the adequacy of the selected respiratory protection. These may be government mandated or vendor recommended.
- ▶ Certified respirators will be useful for protecting workers from inhalation of particulates when properly selected and fit tested as part of a complete respiratory protection program.
- ▶ Use approved positive flow mask if significant quantities of dust becomes airborne.
- ▶ Try to avoid creating dust conditions.

**SECTION 9 Physical and chemical properties**

**Information on basic physical and chemical properties**

<b>Appearance</b>	Purple-bronze almost black, odourless, crystals powder with metallic lustre. Sweet with an astringent after-taste; mixes with water. Solubility in water: 28.3 g/l @ 0 C. and : 250 g/l @ 65 C. Concentrated solutions are alkaline. Decomposed by alcohol and many other organic solvents.		
<b>Physical state</b>	Divided Solid	<b>Relative density (Water = 1)</b>	2.7
<b>Odour</b>	Not Available	<b>Partition coefficient n-octanol / water</b>	Not Available
<b>Odour threshold</b>	Not Available	<b>Auto-ignition temperature (°C)</b>	Not Applicable
<b>pH (as supplied)</b>	Not Applicable	<b>Decomposition temperature</b>	240
<b>Melting point / freezing point (°C)</b>	<240 (decomp.)	<b>Viscosity (cSt)</b>	Not Applicable

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Initial boiling point and boiling range (°C)	Decomposes	Molecular weight (g/mol)	158.04
Flash point (°C)	Not Applicable	Taste	Not Available
Evaporation rate	Not Applicable	Explosive properties	Not Available
Flammability	Not Applicable	Oxidising properties	Not Available
Upper Explosive Limit (%)	Not Applicable	Surface Tension (dyn/cm or mN/m)	Not Applicable
Lower Explosive Limit (%)	Not Applicable	Volatile Component (%vol)	Not Applicable
Vapour pressure (kPa)	Not available.	Gas group	Not Available
Solubility in water	Miscible	pH as a solution (1%)	>7
Vapour density (Air = 1)	Not Applicable	VOC g/L	Not Applicable

SECTION 10 Stability and reactivity

Reactivity	See section 7
Chemical stability	<ul style="list-style-type: none"> <li>▶ Unstable in the presence of incompatible materials.</li> <li>▶ Product is considered stable under normal handling conditions.</li> <li>▶ Prolonged exposure to heat.</li> <li>▶ Hazardous polymerisation will not occur.</li> <li>▶ Presence of elevated temperatures.</li> </ul> <p>Unstable in the presence of incompatible materials</p>
Possibility of hazardous reactions	See section 7
Conditions to avoid	See section 7
Incompatible materials	See section 7
Hazardous decomposition products	See section 5

SECTION 11 Toxicological information

Information on toxicological effects

Inhaled	<p>There is strong evidence to suggest that this material can cause, if inhaled once, very serious, irreversible damage of organs. Inhalation of dusts, generated by the material during the course of normal handling, may produce severe damage to the health of the individual. Relatively small amounts absorbed from the lungs may prove fatal.</p> <p>There is some evidence to suggest that the material can cause respiratory irritation in some persons. The body's response to such irritation can cause further lung damage.</p> <p>Persons with impaired respiratory function, airway diseases and conditions such as emphysema or chronic bronchitis, may incur further disability if excessive concentrations of particulate are inhaled.</p> <p>If prior damage to the circulatory or nervous systems has occurred or if kidney damage has been sustained, proper screenings should be conducted on individuals who may be exposed to further risk if handling and use of the material result in excessive exposures.</p> <p>Manganese fume is toxic and produces nervous system effects characterised by tiredness. Acute poisoning is rare although acute inflammation of the lungs may occur. A chemical pneumonia may also result from frequent exposure. Inhalation of freshly formed metal oxide particles sized below 1.5 microns and generally between 0.02 to 0.05 microns may result in "metal fume fever". Symptoms may be delayed for up to 12 hours and begin with the sudden onset of thirst, and a sweet, metallic or foul taste in the mouth. Other symptoms include upper respiratory tract irritation accompanied by coughing and a dryness of the mucous membranes, lassitude and a generalised feeling of malaise. Mild to severe headache, nausea, occasional vomiting, fever or chills, exaggerated mental activity, profuse sweating, diarrhoea, excessive urination and prostration may also occur. Tolerance to the fumes develops rapidly, but is quickly lost.</p> <p>Inhalation of dusts, generated by the material during the course of normal handling, may be damaging to the health of the individual.</p>
Ingestion	<p>Accidental ingestion of the material may be harmful; animal experiments indicate that ingestion of less than 150 gram may be fatal or may produce serious damage to the health of the individual.</p> <p>There is strong evidence to suggest that this material can cause, if swallowed once, very serious, irreversible damage of organs. Ingestion of permanganates may cause brown discolouration and burns to the mouth with swelling of the tongue, nausea, vomiting, diarrhoea, high-pitched noisy breathing, slow pulse, shock and fall in blood pressure. Fatal oral dose is estimated to be around 10g. Death may occur up to one month from the time of poisoning.</p> <p>Poisonings rarely occur after oral administration of manganese salts because they are poorly absorbed from the gut.</p>
Skin Contact	<p>This material can cause inflammation of the skin on contact in some persons.</p> <p>There is strong evidence to suggest that this material, on a single contact with skin, can cause very serious, irreversible damage of organs. The material may accentuate any pre-existing dermatitis condition</p> <p>Open cuts, abraded or irritated skin should not be exposed to this material</p> <p>Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.</p>
Eye	<p>If applied to the eyes, this material causes severe eye damage.</p> <p>Eye contact with permanganates may produce brown discolouration.</p>
Chronic	<p>No known cases of chronic manganese poisoning by potassium permanganate have been reported. [CCINFO, Harrisons Crossfield]</p> <p>Toxic: danger of serious damage to health by prolonged exposure through inhalation, in contact with skin and if swallowed.</p> <p>This material can cause serious damage if one is exposed to it for long periods. It can be assumed that it contains a substance which can produce severe defects.</p> <p>Ample evidence from experiments exists that there is a suspicion this material directly reduces fertility.</p> <p>Based on experience with animal studies, exposure to the material may result in toxic effects to the development of the foetus, at levels which do not cause significant toxic effects to the mother.</p> <p>Substance accumulation, in the human body, may occur and may cause some concern following repeated or long-term occupational exposure.</p> <p>Long term exposure to high dust concentrations may cause changes in lung function i.e. pneumoconiosis, caused by particles less than 0.5 micron penetrating and remaining in the lung.</p> <p>Manganese is an essential trace element. Chronic exposure to low levels of manganese can include a mask-like facial expression, spastic gait, tremors, slurred speech, disordered muscle tone, fatigue, anorexia, loss of strength and energy, apathy and poor concentration.</p>



POTASSIUM PERMANGANATE

potassium permanganate	TOXICITY	IRRITATION
	=100 mg/kg <sup>[2]</sup>	Eye: adverse effect observed (irritating) <sup>[1]</sup>
	=135 mg/kg <sup>[2]</sup>	Skin: adverse effect observed (corrosive) <sup>[1]</sup>
	=2400 mg/kg <sup>[2]</sup>	
	=400 mg/kg <sup>[2]</sup>	
	=600 mg/kg <sup>[2]</sup>	
	100 mg/kg <sup>[2]</sup>	
	143 mg/kg <sup>[2]</sup>	
	2.4 mg/kg <sup>[2]</sup>	
	Oral (mouse) LD50: =2157 mg/kg <sup>[2]</sup>	
	Oral (mouse) LD50: =750 mg/kg <sup>[2]</sup>	
Oral (rat) LD50: =1090 mg/kg <sup>[2]</sup>		
Oral (rat) LD50: =750 mg/kg <sup>[2]</sup>		

**Legend:** 1. Value obtained from Europe ECHA Registered Substances - Acute toxicity 2. \* Value obtained from manufacturer's SDS. Unless otherwise specified data extracted from RTECS - Register of Toxic Effect of chemical Substances

<b>POTASSIUM PERMANGANATE</b>	Dyspnae, nausea, effects on spermatogenesis and the male fertility index recorded.
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<b>Acute Toxicity</b>	✓	<b>Carcinogenicity</b>	✗
<b>Skin Irritation/Corrosion</b>	✗	<b>Reproductivity</b>	✓
<b>Serious Eye Damage/Irritation</b>	✓	<b>STOT - Single Exposure</b>	✗
<b>Respiratory or Skin sensitisation</b>	✗	<b>STOT - Repeated Exposure</b>	✓
<b>Mutagenicity</b>	✗	<b>Aspiration Hazard</b>	✗

**Legend:** ✗ – Data either not available or does not fill the criteria for classification  
✓ – Data available to make classification

SECTION 12 Ecological information

Toxicity

potassium permanganate	Endpoint	Test Duration (hr)	Species	Value	Source
	LC50	96	Fish	0.47mg/L	2
	EC50	48	Crustacea	0.06mg/L	2
	EC100	48	Crustacea	0.32mg/L	2
	NOEC	48	Crustacea	0.01mg/L	2

**Legend:** Extracted from 1. IUCLID Toxicity Data 2. Europe ECHA Registered Substances - Ecotoxicological Information - Aquatic Toxicity 3. EPIWIN Suite V3.12 (QSAR) - Aquatic Toxicity Data (Estimated) 4. US EPA, Ecotox database - Aquatic Toxicity Data 5. ECETOC Aquatic Hazard Assessment Data 6. NITE (Japan) - Bioconcentration Data 7. METI (Japan) - Bioconcentration Data 8. Vendor Data

Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Do NOT allow product to come in contact with surface waters or to intertidal areas below the mean high water mark. Do not contaminate water when cleaning equipment or disposing of equipment wash-waters.

Wastes resulting from use of the product must be disposed of on site or at approved waste sites.

For Metal:

Atmospheric Fate - Metal-containing inorganic substances generally have negligible vapour pressure and are not expected to partition to air.

Environmental Fate: Environmental processes, such as oxidation, the presence of acids or bases and microbiological processes, may transform insoluble metals to more soluble ionic forms. Environmental processes may enhance bioavailability and may also be important in changing solubilities.

Aquatic/Terrestrial Fate: When released to dry soil, most metals will exhibit limited mobility and remain in the upper layer; some will leach locally into ground water and/ or surface water ecosystems when soaked by rain or melt ice. A metal ion is considered infinitely persistent because it cannot degrade further. Once released to surface waters and moist soils their fate depends on solubility and dissociation in water. A significant proportion of dissolved/ sorbed metals will end up in sediments through the settling of suspended particles. The remaining metal ions can then be taken up by aquatic organisms. Ionic species may bind to dissolved ligands or sorb to solid particles in water.

For Manganese and its Compounds:

Environmental Fate: Manganese is a naturally occurring element in the environment occurring as a result of weathering of geological material. It also occurs from its use in steel manufacture/ coal mining. The most commonly occurring of 11 possible oxidation states are +2, (e.g. manganese chloride or sulfate), +4, (e.g. manganese dioxide), and +7 (e.g. potassium permanganate), although the latter is unstable in the environment.

Atmospheric Fate: Elemental/inorganic manganese compounds may exist in air as suspended particulates from industrial emissions or soil erosion. Manganese-containing particles are mainly removed from the atmosphere by gravitational settling - large particles tend to fall out faster than small particles. The half-life of airborne particles is usually on the order of days, depending on the size of the particle and atmospheric conditions. Some removal by washout mechanisms such as rain may also occur, although it is of minor significance in comparison to dry deposition.

Terrestrial Fate: Manganese in soil can migrate as particulate matter to air or water and soluble manganese compounds can be leached from the soil.

**DO NOT discharge into sewer or waterways.**

The material is classified as an **ecotoxin\*** because the **Daphnia EC50 (48 hours)** is less than or equal to 0.1 mg/l

\* Classification of Substances as Ecotoxic (Dangerous to the Environment)

Appendix 8, Table 1

Compiler's Guide for the Preparation of International Chemical Safety Cards: 1993 Commission of the European Communities

Persistence and degradability

<b>Ingredient</b>	<b>Persistence: Water/Soil</b>	<b>Persistence: Air</b>
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Continued...



POTASSIUM PERMANGANATE

Ingredient	Persistence: Water/Soil	Persistence: Air
potassium permanganate	HIGH	HIGH

Bioaccumulative potential

Ingredient	Bioaccumulation
potassium permanganate	LOW (BCF = 81)

Mobility in soil

Ingredient	Mobility
potassium permanganate	LOW (KOC = 48.64)



SECTION 13 Disposal considerations

Waste treatment methods

<p><b>Product / Packaging disposal</b></p>	<ul style="list-style-type: none"> <li>▶ Containers may still present a chemical hazard/ danger when empty.</li> <li>▶ Return to supplier for reuse/ recycling if possible.</li> </ul> <p>Otherwise:</p> <ul style="list-style-type: none"> <li>▶ If container can not be cleaned sufficiently well to ensure that residuals do not remain or if the container cannot be used to store the same product, then puncture containers, to prevent re-use, and bury at an authorised landfill.</li> <li>▶ Where possible retain label warnings and SDS and observe all notices pertaining to the product.</li> </ul> <p>For small quantities of permanganate:</p> <ul style="list-style-type: none"> <li>▶ Dissolve solid residue in water. Add a reducer (hypochlorite, a bisulfate, or a ferrous salt but not carbon, sulfur or strong reducing agent) and sulfuric acid to promote reduction.</li> <li>▶ Neutralise with soda ash.</li> <li>▶ Bury precipitate in an authorised landfill.</li> <li>▶ Decontaminate empty containers with reducer, acid and soda ash, as above.</li> </ul> <p>Legislation addressing waste disposal requirements may differ by country, state and/ or territory. Each user must refer to laws operating in their area. In some areas, certain wastes must be tracked.</p> <p>A Hierarchy of Controls seems to be common - the user should investigate:</p> <ul style="list-style-type: none"> <li>▶ Reduction</li> <li>▶ Reuse</li> <li>▶ Recycling</li> <li>▶ Disposal (if all else fails)</li> </ul> <p>This material may be recycled if unused, or if it has not been contaminated so as to make it unsuitable for its intended use. Shelf life considerations should also be applied in making decisions of this type. Note that properties of a material may change in use, and recycling or reuse may not always be appropriate. In most instances the supplier of the material should be consulted.</p> <ul style="list-style-type: none"> <li>▶ <b>DO NOT allow wash water from cleaning or process equipment to enter drains.</b></li> <li>▶ It may be necessary to collect all wash water for treatment before disposal.</li> <li>▶ In all cases disposal to sewer may be subject to local laws and regulations and these should be considered first.</li> <li>▶ Where in doubt contact the responsible authority.</li> </ul> <p>For small quantities of oxidising agent:</p> <ul style="list-style-type: none"> <li>▶ Cautiously acidify a 3% solution to pH 2 with sulfuric acid.</li> <li>▶ Gradually add a 50% excess of sodium bisulfite solution with stirring.</li> <li>▶ Add a further 10% sodium bisulfite.</li> <li>▶ If no further reaction occurs (as indicated by a rise in temperature) cautiously add more acid.</li> <li>▶ Recycle wherever possible or consult manufacturer for recycling options.</li> <li>▶ Consult State Land Waste Management Authority for disposal.</li> <li>▶ Bury residue in an authorised landfill.</li> <li>▶ Recycle containers if possible, or dispose of in an authorised landfill.</li> </ul>
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SECTION 14 Transport information

Labels Required

	
Marine Pollutant	
HAZCHEM	1Y

Land transport (ADG)

UN number	1490
UN proper shipping name	POTASSIUM PERMANGANATE
Transport hazard class(es)	Class 5.1 Subrisk Not Applicable
Packing group	II

POTASSIUM PERMANGANATE

<b>Environmental hazard</b>	Environmentally hazardous	
<b>Special precautions for user</b>	Special provisions	Not Applicable
	Limited quantity	1 kg

**Air transport (ICAO-IATA / DGR)**

<b>UN number</b>	1490	
<b>UN proper shipping name</b>	Potassium permanganate	
<b>Transport hazard class(es)</b>	ICAO/IATA Class	5.1
	ICAO / IATA Subrisk	Not Applicable
	ERG Code	5L
<b>Packing group</b>	II	
<b>Environmental hazard</b>	Environmentally hazardous	
<b>Special precautions for user</b>	Special provisions	Not Applicable
	Cargo Only Packing Instructions	562
	Cargo Only Maximum Qty / Pack	25 kg
	Passenger and Cargo Packing Instructions	558
	Passenger and Cargo Maximum Qty / Pack	5 kg
	Passenger and Cargo Limited Quantity Packing Instructions	Y544
	Passenger and Cargo Limited Maximum Qty / Pack	2.5 kg

**Sea transport (IMDG-Code / GGVSee)**

<b>UN number</b>	1490	
<b>UN proper shipping name</b>	POTASSIUM PERMANGANATE	
<b>Transport hazard class(es)</b>	IMDG Class	5.1
	IMDG Subrisk	Not Applicable
<b>Packing group</b>	II	
<b>Environmental hazard</b>	Marine Pollutant	
<b>Special precautions for user</b>	EMS Number	F-H , S-Q
	Special provisions	Not Applicable
	Limited Quantities	1 kg

**Transport in bulk according to Annex II of MARPOL and the IBC code**

Not Applicable

**SECTION 15 Regulatory information**

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

potassium permanganate is found on the following regulatory lists

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals

Australian Inventory of Industrial Chemicals (AIIC)

**National Inventory Status**

National Inventory	Status
Australia - AIIC	Yes
Australia Non-Industrial Use	No (potassium permanganate)
Canada - DSL	Yes
Canada - NDSL	No (potassium permanganate)
China - IECSC	Yes
Europe - EINEC / ELINCS / NLP	Yes
Japan - ENCS	Yes
Korea - KECI	Yes
New Zealand - NZIoC	Yes
Philippines - PICCS	Yes
USA - TSCA	Yes
Taiwan - TCSI	Yes
Mexico - INSQ	Yes
Vietnam - NCI	Yes
Russia - ARIPS	Yes

Continued...

## POTASSIUM PERMANGANATE

National Inventory	Status
<b>Legend:</b>	Yes = All CAS declared ingredients are on the inventory No = One or more of the CAS listed ingredients are not on the inventory and are not exempt from listing(see specific ingredients in brackets)

### SECTION 16 Other information

Revision Date	19/10/2019
Initial Date	23/04/2005

### SDS Version Summary

Version	Issue Date	Sections Updated
10.1.1.1	05/03/2018	Physical Properties, Storage (storage incompatibility), Supplier Information, Synonyms, Use
11.1.1.1	19/10/2019	Acute Health (inhaled), Acute Health (skin), Acute Health (swallowed), Advice to Doctor, CAS Number, Chronic Health, Classification, Environmental, First Aid (skin), First Aid (swallowed), Personal Protection (eye), Personal Protection (hands/feet), Physical Properties, Spills (minor), Storage (suitable container), Synonyms, Transport Information

### Other information

Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.

The SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

### Definitions and abbreviations

PC – TWA: Permissible Concentration-Time Weighted Average  
PC – STEL: Permissible Concentration-Short Term Exposure Limit  
IARC: International Agency for Research on Cancer  
ACGIH: American Conference of Governmental Industrial Hygienists  
STEL: Short Term Exposure Limit  
TEEL: Temporary Emergency Exposure Limit.  
IDLH: Immediately Dangerous to Life or Health Concentrations  
OSF: Odour Safety Factor  
NOAEL :No Observed Adverse Effect Level  
LOAEL: Lowest Observed Adverse Effect Level  
TLV: Threshold Limit Value  
LOD: Limit Of Detection  
OTV: Odour Threshold Value  
BCF: BioConcentration Factors  
BEI: Biological Exposure Index

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TEL (+61 3) 9572 4700.