POTASSIUM PERMANGANATE

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME
POTASSIUM PERMANGANATE

OTHER NAMES

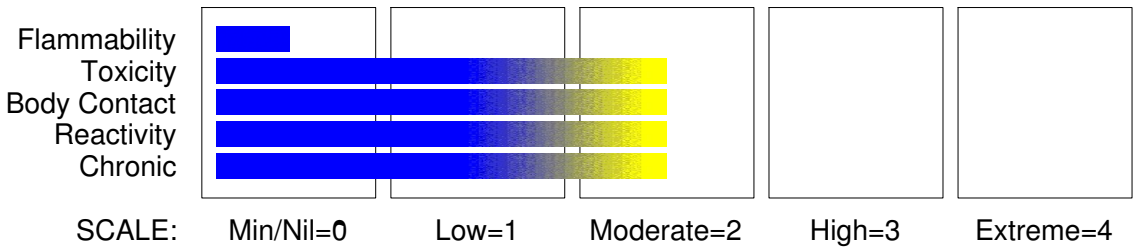
Mn-O4.K, KMnO4, Cairox, "chameleon mineral", "Condy's crystals", "permanganic acid, potassium salt", "permanganate of potash", "purple salt", "C.I. 77755", APS, AR00000414, TECH00004459, M-F00011080, M-F00011080, UL00000415, BP00004446, USP00005769, TECH0000577C

PROPER SHIPPING NAME
POTASSIUM PERMANGANATE

PRODUCT USE
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.

SUPPLIER
Company: S D FINE- CHEM LIMITED
Address:
315- 317, T.V. INDUSTRIAL ESTATE,
248, WORLI,
MUMBAI- 400030.INDIA.
technical@sdfine.com
Telephone: 91- 22- 24959898
Telephone: 91- 22- 24959899
Fax: 91- 22- 24937232

HAZARD RATINGS



Section 2 - HAZARDS IDENTIFICATION

GHS Classification
Acute Toxicity (Oral) Category 4
Chronic Aquatic Hazard Category 1

continued...

Eye Irritation Category 2A
Oxidizing Solid Category 2
Respiratory Irritation Category 3
Skin Corrosion/Irritation Category 3

EMERGENCY OVERVIEW

HAZARD

DANGER
Determined by using GHS criteria:
H335 H272 H302 H316 H319 H410
May cause respiratory irritation
May intensify fire; oxidizer
Harmful if swallowed
Causes mild skin irritation
Causes serious eye irritation
Very toxic to aquatic life with long lasting effects

PRECAUTIONARY STATEMENTS

Prevention

Do not eat, drink or smoke when using this product.
Wash hands thoroughly after handling.
Take any precaution to avoid mixing with combustible or incompatible materials.
Keep away from heat.

Response

If skin irritation occurs, seek medical advice/attention.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
If eye irritation persists, get medical advice/attention.
Wear eye/face protection.
Specific treatment: refer to Label or MSDS.

Storage

Store away from combustibles and incompatible materials
Store locked up.

Disposal

Dispose of contents and container in accordance with relevant legislation.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
potassium permanganate	7722-64-7	>99

continued...

Section 4 - FIRST AID MEASURES

SWALLOWED

· IF SWALLOWED, REFER FOR MEDICAL ATTENTION, WHERE POSSIBLE, WITHOUT DELAY.
· For advice, contact a Poisons Information Centre or a doctor.
· Urgent hospital treatment is likely to be needed.
· 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.
· 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 MSDS should be provided. Further action will be the responsibility of the medical specialist.
· If medical attention is not available on the worksite or surroundings send the patient to a hospital together with a copy of the MSDS.
· Where medical attention is not immediately available or where the patient is more than 15 minutes from a hospital or unless instructed otherwise:
· INDUCE vomiting with fingers down the back of the throat, ONLY IF CONSCIOUS. Lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.
NOTE: Wear a protective glove when inducing vomiting by mechanical means.

EYE

If this product comes in contact with the eyes:
· Wash out immediately with fresh running water.
· 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.
· If pain persists or recurs seek medical attention.
· Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

SKIN

If skin contact occurs:
· Immediately remove all contaminated clothing, including footwear.
· Flush skin and hair with running water (and soap if available).
· Seek medical attention in event of irritation.

INHALED

· If fumes or combustion products are inhaled remove from contaminated area.
· Lay patient down. Keep warm and rested.
· Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.
· 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.
· Transport to hospital, or doctor.

NOTES TO PHYSICIAN

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.].

continued...

Section 5 - FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA
FOR SMALL FIRE:
· USE FLOODING QUANTITIES OF WATER.
· DO NOT use dry chemicals, CO2 or foam.
FOR LARGE FIRE:
· Flood fire area with water from a protected position.

FIRE FIGHTING
· Alert Fire Brigade and tell them location and nature of hazard.
· May be violently or explosively reactive.
· Wear breathing apparatus plus protective gloves.
· Prevent, by any means available, spillage from entering drains or water course.
· Fight fire from a safe distance, with adequate cover.
· Extinguishers should be used only by trained personnel.
· Use water delivered as a fine spray to control fire and cool adjacent area.
· Avoid spraying water onto liquid pools.
· DO NOT approach containers suspected to be hot.
· Cool fire exposed containers with water spray from a protected location.
· If safe to do so, remove containers from path of fire.
· If fire gets out of control withdraw personnel and warn against entry.
· Equipment should be thoroughly decontaminated after use.

FIRE/EXPLOSION HAZARD
· Will not burn but increases intensity of fire.
· Heating may cause expansion or decomposition leading to violent rupture of containers.
· Heat affected containers remain hazardous.
· Contact with combustibles such as wood, paper, oil or finely divided metal may produce spontaneous combustion or violent decomposition.
· May emit irritating, poisonous or corrosive fumes.

FIRE INCOMPATIBILITY
Avoid storage with reducing agents.
Avoid any contamination of this material as it is very reactive and any contamination is potentially hazardous.

Section 6 - ACCIDENTAL RELEASE MEASURES

EMERGENCY PROCEDURES

MINOR SPILLS
· Clean up all spills immediately.
· No smoking, naked lights, ignition sources.
· Avoid all contact with any organic matter including fuel, solvents, sawdust, paper or cloth and other incompatible materials, as ignition may result.
· Avoid breathing dust or vapours and all contact with skin and eyes.
· Control personal contact by using protective equipment.
· Contain and absorb spill with dry sand, earth, inert material or vermiculite.
· DO NOT use sawdust as fire may result.
· Scoop up solid residues and seal in labelled drums for disposal.
· Neutralise/decontaminate area.

continued...

MAJOR SPILLS

· Clear area of personnel and move upwind.
· Alert Fire Brigade and tell them location and nature of hazard.
· May be violently or explosively reactive.
· Wear breathing apparatus and protective gloves.
· Prevent, by any means available, spillage from entering drains or water courses.
· No smoking, flames or ignition sources.
· Increase ventilation.
· Contain spill with sand, earth or other clean, inert materials.
· NEVER USE organic absorbents such as sawdust, paper or cloth.
· Use spark-free and explosion-proof equipment.
· Collect any recoverable product into labelled containers for possible recycling.
· Avoid contamination with organic matter to prevent subsequent fire and explosion.
· DO NOT mix fresh with recovered material.
· Collect residues and seal in labelled drums for disposal.
· Wash area and prevent runoff into drains.
· Decontaminate equipment and launder protective clothing before storage and re-use.
· If contamination of drains or waterways occurs advise emergency services.

Cover residue with a reducer (hypo, a bisulfate or a ferrous salt, but not carbon, sulfur or a strong reducing agent) mix and spray with water.
To promote rapid reduction, add sulfuric acid with reducer above. Scoop into a metal container of water and neutralise with soda ash. Wash residue with soap solution containing some reducer.

EMERGENCY RESPONSE PLANNING GUIDELINES (ERPG)

The maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to one hour WITHOUT experiencing or developing

life-threatening health effects is:
potassium permanganate 125 mg/m³

irreversible or other serious effects or symptoms which could impair an individual's ability to take protective action is:
potassium permanganate 15 mg/m³

other than mild, transient adverse effects without perceiving a clearly defined odour is:
potassium permanganate 7.5 mg/m³

The threshold concentration below which most people will experience no appreciable risk of health effects:
potassium permanganate 0.6 mg/m³

American Industrial Hygiene Association (AIHA)

Ingredients considered according to the following cutoffs

Very Toxic (T+)	>= 0.1%	Toxic (T)	>= 3.0%
R50	>= 0.25%	Corrosive (C)	>= 5.0%
R51	>= 2.5%		
else	>= 10%		

where percentage is percentage of ingredient found in the mixture

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

Section 7 - HANDLING AND STORAGE

PROCEDURE FOR HANDLING

· Avoid personal contact and inhalation of dust, mist or vapours.
· Provide adequate ventilation.

continued...

· Always wear protective equipment and wash off any spillage from clothing.
· Keep material away from light, heat, flammables or combustibles.
· Keep cool, dry and away from incompatible materials.
· Avoid physical damage to containers.
· DO NOT repack or return unused portions to original containers. Withdraw only sufficient amounts for immediate use.
· Contamination can lead to decomposition leading to possible intense heat and fire.
· When handling NEVER smoke, eat or drink.
· Always wash hands with soap and water after handling.
· Use only good occupational work practice.
· Observe manufacturer's storing and handling directions.

SUITABLE CONTAINER

Glass container.
· DO NOT repack. Use containers supplied by manufacturer only.
For low viscosity materials
· Drums and jerricans must be of the non-removable head type.
· Where a can is to be used as an inner package, the can must have a screwed enclosure.
For materials with a viscosity of at least 2680 cSt. (23 deg. C) and solids:
· Removable head packaging and
· cans with friction closures may be used.
-
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 *.
-
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 *.
-
* unless the outer packaging is a close fitting moulded plastic box and the substances are not incompatible with the plastic.

STORAGE INCOMPATIBILITY

Contact with acids produces toxic fumes.
Avoid any contamination of this material as it is very reactive and any contamination is potentially hazardous.
Avoid storage with reducing agents.
Oxidising agents as a class are not necessarily combustible themselves, but can increase the risk and intensity of fire in many other substances.
Segregate 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.
Reacts vigorously with metallic powders, ammonium compounds, phosphorous, carbon, arsenates, ethylene glycol, sulfur, hydrazine, metal hydrides, peroxides, alcohol and other combustible materials. Reacts violently when exposed to sulfuric acid or hydrogen peroxide.
May form explosive compounds with ammonium compounds.
Potassium permanganate is readily decomposed by many reducing substances such as ferrous or mercury salts, iodides, bromides, oxalates, etc.,
Reacts with concentrated acids to produce oxygen.
Reacts with hydrochloric acid to produce chlorine.
May cause spontaneous ignition if mixed with glycol anti-freeze compounds.

STORAGE REQUIREMENTS

· Store in original containers.
· Keep containers securely sealed as supplied.
· Store in a cool, well ventilated area.
· Keep dry.

continued...

· Store under cover and away from sunlight.
· Store away from flammable or combustible materials, debris and waste. Contact may cause fire or violent reaction.
· Store away from incompatible materials and foodstuff containers.
· DO NOT stack on wooden floors or pallets.
· Protect containers from physical damage.
· Check regularly for leaks.
· Observe manufacturer's storage and handling recommendations.
In addition, Goods of Class 5.1, packing group II should be:
· stored in piles so that
· the height of the pile does not exceed 1 metre
· the maximum quantity in a pile or building does not exceed 1000 tonnes unless the area is provided with automatic fire extinguishers
· 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.
· 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.
· the minimum distance to walls is not less than 1 metre.

SAFE STORAGE WITH OTHER CLASSIFIED CHEMICALS

X	X	X	X	0	0

+: May be stored together
O: May be stored together with specific preventions
X: Must not be stored together

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE CONTROLS

EMERGENCY EXPOSURE LIMITS

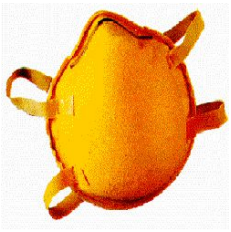
Material	Revised IDLH Value (mg/m3)	Revised IDLH Value (ppm)
potassium permanganate	500	

MATERIAL DATA

A number of studies have shown that susceptibility to the effects of manganese at or about 1 - 5 mg/m3 (TWA) can lead to clinical manifestations of manganism or more commonly to the development of indicators of sub-clinical manganism (e.g. hand tremor, exaggerated reflexes, short-term memory deficits, poor psychomotor performance). Controlling long -term exposure to the recommended ES TWA level or below should provide protection for those individuals susceptible to neurological effects of prolonged exposure.
Ceiling values were recommended for manganese and compounds in earlier publications. As manganese is a chronic toxin a TWA is considered more appropriate. Because workers exposed to fume exhibited manganism at air-borne concentrations below those that affect workers exposed to dust a lower value has been proposed to provide an extra margin of safety. This value is still above that experienced by two workers exposed to manganese fume in the course of one study.

continued...

PERSONAL PROTECTION

EYE

· Chemical goggles.
· Full face shield may be required for supplementary but never for primary protection of eyes
· Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lens 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. In the event of chemical exposure, begin eye irrigation immediately and remove contact lens as soon as practicable. Lens should be removed at the first signs of eye redness or irritation - lens should be removed in a clean environment only after workers have washed hands thoroughly. [CDC NIOSH Current Intelligence Bulletin 59].

HANDS/FEET

Wear chemical protective gloves, eg. PVC.
Wear safety footwear or safety gumboots, eg. Rubber.
DO NOT wear cotton or cotton-backed gloves.
DO NOT wear leather gloves.
Promptly hose all spills off leather shoes or boots or ensure that such footwear is protected with PVC over-shoes.
Suitability and durability of glove type is dependent on usage. Factors such as:
· frequency and duration of contact,
· chemical resistance of glove material,
· glove thickness and
· dexterity,
are important in the selection of gloves.

OTHER

· Overalls.
· PVC Apron.
· PVC protective suit may be required if exposure severe.
· Eyewash unit.
· Ensure there is ready access to a safety shower.

RESPIRATOR

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

* - Negative pressure demand ** - Continuous flow.

The local concentration of material, quantity and conditions of use determine the type of personal protective equipment required.
For further information consult

continued...

your
Occupational Health and Safety Advisor.

ENGINEERING CONTROLS

Local exhaust ventilation usually required. If risk of overexposure exists, wear approved respirator. Correct fit is essential to obtain adequate protection. Supplied-air type respirator may be required in special circumstances. Correct fit is essential to ensure adequate protection.
An approved self contained breathing apparatus (SCBA) may be required in some situations. Provide adequate ventilation in warehouse or closed storage area. Air contaminants generated in the workplace possess varying "escape" velocities which, in turn, determine the "capture velocities" of fresh circulating air required to effectively remove the contaminant.

Type of Contaminant:	Air Speed:
solvent, vapours, degreasing etc., evaporating from tank (in still air).	0.25- 0.5 m/s (50- 100 f/min.)
aerosols, fumes from pouring operations, intermittent container filling, low speed conveyer transfers, welding, spray drift, plating acid fumes, pickling (released at low velocity into zone of active generation)	0.5- 1 m/s (100- 200 f/min.)
direct spray, spray painting in shallow booths, drum filling, conveyer loading, crusher dusts, gas discharge (active generation into zone of rapid air motion)	1- 2.5 m/s (200- 500 f/min.)
grinding, abrasive blasting, tumbling, high speed wheel generated dusts (released at high initial velocity into zone of very high rapid air motion).	2.5- 10 m/s (500- 2000 f/min.)

Within each range the appropriate value depends on:

Lower end of the range	Upper end of the range
1: Room air currents minimal or favourable to capture	1: Disturbing room air currents
2: Contaminants of low toxicity or of nuisance value only.	2: Contaminants of high toxicity
3: Intermittent, low production.	3: High production, heavy use
4: Large hood or large air mass in motion	4: Small hood- local control only

Simple theory shows that air velocity falls rapidly with distance away from the opening of a simple extraction pipe. Velocity generally decreases with the square of distance from the extraction point (in simple cases). Therefore the air speed at the extraction point should be adjusted, accordingly, after reference to distance from the contaminating source. The air velocity at the extraction fan, for example, should be a minimum of 1-2 m/s (200-400 f/min) for extraction of solvents generated in a tank 2 meters distant from the extraction point. Other mechanical considerations, producing performance deficits within the extraction apparatus, make it essential that theoretical air velocities are multiplied by factors of 10 or more when extraction systems are installed or used.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE

Purple-bronze almost black, odourless, crystals powder with metallic lustre.

continued...

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.

PHYSICAL PROPERTIES
Solid.
Mixes with water.

Molecular Weight: 158.04
Melting Range (°C): <240 (decomp.)
Solubility in water (g/L): Miscible
pH (1% solution): >7
Volatile Component (%vol): Not applicable.
Relative Vapour Density (air=1): Not available.
Lower Explosive Limit (%): Not applicable
Autoignition Temp (°C): Not applicable
State: Divided solid

Boiling Range (°C): Decomposes
Specific Gravity (water=1): 2.7
pH (as supplied): Not applicable
Vapour Pressure (kPa): Not available.
Evaporation Rate: Not applicable
Flash Point (°C): Not applicable
Upper Explosive Limit (%): Not applicable
Decomposition Temp (°C): Not Available
Viscosity: Not Applicable

Section 10 - CHEMICAL STABILITY AND REACTIVITY INFORMATION

CONDITIONS CONTRIBUTING TO INSTABILITY
Presence of elevated temperatures.
Presence of incompatible materials.
- Presence of incompatible materials.
- Product is considered stable under normal handling conditions.
- Prolonged exposure to heat.
- Hazardous polymerisation will not occur.

Section 11 - TOXICOLOGICAL INFORMATION

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS

SWALLOWED
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.
Poisonings rarely occur after oral administration of manganese salts as they are generally poorly absorbed from the gut (generally less than 4%) and seems to be dependent , in part, on levels of dietary iron and may increase following the consumption of alcohol. A side-effect of oral manganese administration is an increase in losses of calcium in the faeces and a subsequent lowering of calcium blood levels. Absorbed manganese tends to be slowly excreted in the bile. Divalent manganese appears to be 2.5-3 times more toxic than the trivalent form.

EYE
Evidence exists, or practical experience predicts, that the material may cause eye irritation in a substantial number of individuals and/or may produce significant ocular lesions which are present twenty-four hours or more after instillation into the eye(s) of experimental animals.
Repeated or prolonged eye contact may cause inflammation characterised by temporary redness (similar to windburn) of the conjunctiva (conjunctivitis); temporary impairment of vision and/or other transient eye damage/ulceration may occur.

continued...

SKIN

Limited evidence exists, or practical experience predicts, that the material either produces inflammation of the skin in a substantial number of individuals following direct contact, and/or produces significant inflammation when applied to the healthy intact skin of animals, for up to four hours, such inflammation being present twenty-four hours or more after the end of the exposure period. Skin irritation may also be present after prolonged or repeated exposure; this may result in a form of contact dermatitis (nonallergic). The dermatitis is often characterised by skin redness (erythema) and swelling (oedema) which may progress to blistering (vesiculation), scaling and thickening of the epidermis. At the microscopic level there may be intercellular oedema of the spongy layer of the skin (spongiosis) and intracellular oedema of the epidermis.
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.
Skin contact is not thought to produce harmful health effects (as classified under EC Directives using animal models). Systemic harm, however, has been identified following exposure of animals by at least one other route and the material may still produce health damage following entry through wounds, lesions or abrasions. Good hygiene practice requires that exposure be kept to a minimum and that suitable gloves be used in an occupational setting.

INHALED

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. All symptoms usually subside within 24-36 hours following removal from exposure.
Inhalation of dusts, generated by the material during the course of normal handling, may be damaging to the health of the individual.
Limited evidence or practical experience suggests that the material may produce irritation of the respiratory system, in a significant number of individuals, following inhalation. In contrast to most organs, the lung is able to respond to a chemical insult by first removing or neutralising the irritant and then repairing the damage. The repair process, which initially evolved to protect mammalian lungs from foreign matter and antigens, may however, produce further lung damage resulting in the impairment of gas exchange, the primary function of the lungs. Respiratory tract irritation often results in an inflammatory response involving the recruitment and activation of many cell types, mainly derived from the vascular system.

CHRONIC HEALTH EFFECTS

Manganese is an essential trace element in all living organisms with the level of tissue manganese remaining remarkably constant throughout life. Systemic poisoning may result from inhalation or chronic ingestion of manganese containing substances. Chronic exposure has been associated with two major effects; bronchitis/pneumonitis following inhalation of manganese dusts and "manganism", a neuropsychiatric disorder that may also arise from inhalation exposures. Chronic exposure to low levels may result in the accumulation of toxic concentrations in critical organs. The brain in particular appears to sustain cellular damage to the ganglion. Symptoms appear before any pathology is evident and may include a mask-like facial expression, spastic gait, tremors, slurred speech, sometimes dystonia (disordered muscle tone), fatigue, anorexia, asthenia (loss of strength and energy), apathy and the inability to concentrate. Insomnia may be an early finding. Rat

continued...

studies indicate the gradual accumulation of brain manganese to produce lesions mimicking those found in Parkinsonism.
The onset of chronic manganese poisoning is insidious, with apathy, anorexia weakness, headache and spasms. Manganese psychosis follows with certain definitive features: unaccountable laughter, euphoria, impulsive acts, absentmindedness, mental confusion, aggressiveness and hallucinations. The final stage is characterized by speech difficulties, muscular twitching, spastic gait and other nervous system effects. Symptoms resemble those of Parkinson's disease. If the disease is diagnosed whilst still in the early stages and the patient is removed from exposure, the course may be reversed.
Inhalation of manganese fumes may cause `metal fume fever' characterised by flu-like symptoms: fever, chill, nausea, weakness and body aches. Manganese dust is no longer believed to be a causative factor in pneumonia. If there is any relationship at all, it appears to be as an aggravating factor to a preexisting condition. [ILO Encyclopaedia].
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. A prime symptom is breathlessness. Lung shadows show on X-ray.
Limited evidence suggests that repeated or long-term occupational exposure may produce cumulative health effects involving organs or biochemical systems.
Long term exposures to manganese compounds may effect the central nervous system. Symptoms include muscular weakness and tremors similar to Parkinson's disease. Behavioural changes and handwriting differences may also appear.
Other symptoms include sleepiness, weakness in the legs, muscle twitchings and tremors, nocturnal leg cramps, and typical Parkinsonian slapping gait may appear. These systems may stimulate progressive bulbar paralysis, multiple sclerosis, amyotrophic lateral sclerosis and progressive lenticular degeneration. The blood may show increased erythrocyte formation and increased osmotic fragility. [CCINFO, VW&R]
No known cases of chronic manganese poisoning by potassium permanganate have been reported. [CCINFO, Harrisons & Crossfield]

TOXICITY AND IRRITATION

unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances.

TOXICITY	IRRITATION
Oral (human) LDLo: 143 mg/kg	Nil Reported
Oral (woman) TDLo: 2.4 mg/kg/d	
Oral (rat) LD50: 1090 mg/kg	
Intravenous (Rabbit) LD: 70 mg/kg	
Oral (Guinea pig) LD50: 1151 mg/kg	
Oral (Human) LD: 100 mg/kg	
Oral (Human) LD: 143 mg/kg	
Oral (Mouse) LD50: 2157 mg/kg	
Oral (Dog) LD: 400 mg/kg	
Oral (Rabbit) LD: 600 mg/kg	

Dyspnae, nausea, effects on spermatogenesis and the male fertility index recorded.

Section 12 - ECOLOGICAL INFORMATION

Fish LC50 (96hr.) (mg/l): 3.6

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.
DO NOT discharge into sewer or waterways.
The material is classified as an ecotoxin* because the Daphnia EC50 (48 hours) is less

continued...

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.

Section 13 - DISPOSAL CONSIDERATIONS

· Recycle wherever possible or consult manufacturer for recycling options.
· Consult State Land Waste Management Authority for disposal.
· Bury residue in an authorised landfill.
· Recycle containers if possible, or dispose of in an authorised landfill.
· Containers may still present a chemical hazard/ danger when empty.
· Return to supplier for reuse/ recycling if possible.
Otherwise:
· 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.
· Where possible retain label warnings and MSDS and observe all notices pertaining to the product.
For small quantities: Dissolve solid residue in water. Add a reducer (hypo, a bisulfate, or a ferrous salt but not carbon, sulfur or strong reducing agent) and sulphuric acid to promote reduction. Neutralise with soda ash. Bury precipitate in an authorised landfill.
Decontaminate empty containers with reducer, acid and soda ash, as above.
Recycle containers wherever possible, otherwise dispose of in an authorised landfill.

WASTE DISPOSAL PROCEDURES
• Wear eye protection, protective clothing and nitrile rubber gloves. Work in a well ventilated area. Prepare a saturated aqueous solution of the waste potassium permanganate. Add one drop of concentrated sulfuric acid for every 10mL of solution. Work in a well ventilated area. With stirring add, 10% sodium bisulfite solution until the permanganate colour is discharged and the brown manganese dioxide precipitate dissolves. Neutralise with sodium carbonate if necessary. Empty the colourless solution into the drain with copious amounts of water [Armour 1996].

Section 14 - TRANSPORTATION INFORMATION

Labels Required: OXIDIZING AGENT
HAZCHEM: 1Y

UNDG:

Dangerous Goods Class:	5.1	Subrisk:	None
UN Number:	1490	Packing Group:	II

Shipping Name:POTASSIUM PERMANGANATE

continued...

Air Transport IATA:

ICAO/IATA Class:	5.1	ICAO/IATA Subrisk:	None
UN/ID Number:	1490	Packing Group:	II
Special provisions:	None		

Shipping Name: POTASSIUM PERMANGANATE

Maritime Transport IMDG:

IMDG Class:	5.1	IMDG Subrisk:	None
UN Number:	1490	Packing Group:	II
EMS Number:	F- H, S- Q	Special provisions:	None

Shipping Name: POTASSIUM PERMANGANATE

Section 15 - REGULATORY INFORMATION

REGULATIONS

potassium permanganate (CAS: 7722-64-7) is found on the following regulatory lists;
OECD Representative List of High Production Volume (HPV) Chemicals
United Nations Convention Against Illicit Traffic in Narcotic Drugs and Psychotropic Substances - Table II
United Nations List of Precursors and Chemicals Frequently used in the Illicit Manufacture of Narcotic Drugs and Psychotropic Substances Under International Control - Table I (English)
United Nations List of Precursors and Chemicals Frequently used in the Illicit Manufacture of Narcotic Drugs and Psychotropic Substances Under International Control - Table I (French)
United Nations List of Precursors and Chemicals Frequently used in the Illicit Manufacture of Narcotic Drugs and Psychotropic Substances Under International Control - Table I (Spanish)

Section 16 - OTHER INFORMATION

MSDS SECTION CHANGES

The following table displays the version number of and date on which each section was last changed.

Section Name	Version	Date	Section Name	Version	Date	Section Name	Version	Date
First Aid (eye)	4	26- Apr- 2007	Engineering Control	4	26- Apr- 2007	Acute Health (inhaled)	4	26- Apr- 2007
First Aid (swallowed)	4	26- Apr- 2007	Exposure Standard	4	26- Apr- 2007	Acute Health (skin)	4	26- Apr- 2007
Fire Fighter (extinguishing media)	4	26- Apr- 2007	Personal Protection (eye)	4	26- Apr- 2007	Acute Health (swallowed)	4	26- Apr- 2007
Fire Fighter (fire fighting)	4	26- Apr- 2007	Personal Protection (hands/feet)	4	26- Apr- 2007	Chronic Health	4	26- Apr- 2007
Fire Fighter (fire incompatibility)	4	26- Apr- 2007	Personal Protection (other)	4	26- Apr- 2007	Toxicity and Irritation (Toxicity Figure)	4	26- Apr- 2007
Spills (major)	4	26- Apr- 2007	Physical Properties	4	26- Apr- 2007	Environmental	4	26- Apr- 2007
Storage (storage incompatibility)	4	26- Apr- 2007	Instability Condition	4	26- Apr- 2007	Disposal	4	26- Apr- 2007
Storage (storage requirement)	4	26- Apr- 2007	Acute Health (eye)	4	26- Apr- 2007	Transport	4	26- Apr- 2007
Storage (suitable container)	4	26- Apr- 2007						

The above information is believed to be accurate and represent the best information currently available to us, but does not represent any warranty expressed or implied of the properties of the product. User should make their own investigation to determine the suitability of the information for their particular purpose.

Issue Date: 26-Apr-2018