

**LIQUISOL™ Environmental Oxidant**  
**EC- SAFETY DATA SHEET** according to EC directive 2001/58/EC  
**MATERIAL SAFETY DATA SHEET**

Revision Date: April 2008

Supersedes:

Page 1 of 8

**Section 1 Chemical Product and Company Identification**

<b>PRODUCT NAME:</b> LIQUISOL™ Environmental Oxidant	
<b>TRADE NAME:</b> LIQUISOL™ Environmental Oxidant	
<b>USES OF SUBSTANCE:</b> LIQUISOL™ Environmental Oxidant, is a liquid oxidant recommended for applications that require a concentrated permanganate solution.	
<b>COMPANY NAME (Europe):</b> CARUS CHEMICAL (FOSHAN) COMPANY. Ltd.	<b>COMPANY ADDRESS:</b> Jili Industrial Park, Nanzhuang Chancheng Economic Development Zone Foshan Guangdong 52806, China  <b>INFORMATION:</b> Phone: +86 757 8802 7966 Fax: +86 757 8802 7977
<b>COMPANY NAME (US):</b> CARUS CORPORATION	<b>COMPANY ADDRESS:</b> 315 Fifth Street Peru, IL 61354, USA  <b>INFORMATION:</b> +1 815- 223-1500 +1 815-224-6816 (FAX) <a href="http://www.caruscorporation.com">www.caruscorporation.com</a> (Web) <a href="mailto:salesmkt@caruschem.com">salesmkt@caruschem.com</a> (Email)  <b>EMERGENCY TELEPHONE:</b> (800) 435 -6856 (USA) +1 815-223-1500 (Other countries) (800) 424-9300(CHEMTREC <sup>®</sup> , USA) +1 703-527-3887 (CHEMTREC <sup>®</sup> , Other countries)

**Section 2 Hazards Identification**

**1. EYE CONTACT**

Sodium Permanganate is damaging to eye tissue on contact. It may cause burns that result in damage to the eye.

**2. SKIN CONTACT**

Momentary contact of solution at room temperature may be irritating to the skin, leaving brown stains. Prolonged contact is damaging to the skin.

**3. INHALATION**

Acute inhalation toxicity data are not available. However, airborne concentrations of sodium permanganate in the form of mist may cause irritation to the respiratory tract.

**4. INGESTION**

Sodium permanganate solution, if swallowed, may cause burns to mucous membranes of the mouth, throat, esophagus, and stomach.




**LIQUISOL™ Environmental Oxidant**  
**EC- SAFETY DATA SHEET** according to EC directive 2001/58/EC  
**MATERIAL SAFETY DATA SHEET**

Revision Date: April 2008

Supersedes:

Page 2 of 8

**Section 3 Hazardous Ingredients**

<u>MATERIAL OR COMPONENT</u>	<u>CAS NO.</u>	<u>EINECS</u>	<u>%</u>	<u>HAZARD DATA</u>
Sodium Permanganate	10101-50-5	233-251-1	40-42	<b>PEL/C</b> 5 mg Mn per cubic meter of air <b>TLV-TWA</b> 0.2 mg Mn per cubic meter of air
<b><u>HAZARD SYMBOLS:</u></b>				
				
F+	Xi	N		
<b><u>RISK PHRASES:</u></b>				
8	Contact with combustibles may cause fire.			
22	Harmful if swallowed.			
50/53	Very toxic to aquatic organisms, may cause long-term effects in the aquatic environment.			
<b><u>SAFETY PHRASES:</u></b>				
17	Keep away from combustible materials.			
24/25	Avoid contact with skin and eyes.			
26	In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.			

**Section 4 First Aid Measures**

- EYES**  
Immediately flush eyes with large amounts of water for at least 15 minutes holding lids apart to ensure flushing of the entire surface. Do not attempt to neutralize chemically. Seek medical attention immediately.  
**Note to physician:** Decomposition products are alkaline. Brown stain formed is insoluble manganese dioxide.
- SKIN**  
Immediately wash contaminated areas with water. Remove contaminated clothing and footwear. (**Caution:** Solution may ignite certain textiles). Wash clothing and decontaminate footwear before reuse. Seek medical attention if irritation is severe or persistent.
- INHALATION**  
Remove person from contaminated area to fresh air. If breathing has stopped, resuscitate and administer oxygen if readily available. Seek medical attention immediately.
- INGESTION**  
Never give anything by mouth to an unconscious or convulsing person. If person is conscious, give large quantities of water or milk. Seek medical attention immediately.

**LIQUISOL™ Environmental Oxidant**  
**EC- SAFETY DATA SHEET** according to EC directive 2001/58/EC  
**MATERIAL SAFETY DATA SHEET**

Revision Date: April 2008

Supercedes:

Page 3 of 8

**Section 5 Fire Fighting Measures**

<b><u>NFPA* HAZARD SIGNS</u></b>	
Health Hazard	1 = Materials which under fire conditions would give off irritating combustion products. (less than 1 hour exposure) Materials that on the skin could cause irritation.
Flammability Hazard	0 = Materials that will not burn.
Reactivity Hazard	0 = Materials which in themselves are normally stable, even under fire exposure conditions, and which are not reactive with water.
Special Hazard	OX = Oxidizer
<b>*National Fire Protection Association 704 (USA)</b>	
<b>FIRST RESPONDERS:</b>	Wear protective gloves, boots, goggles, and respirator. In case of fire, wear positive pressure breathing apparatus. Approach incident with caution.
<b>FLASHPOINT</b>	None
<b>FLAMMABLE OR EXPLOSIVE LIMITS</b>	Lower: Nonflammable Upper: Nonflammable
<b>EXTINGUISHING MEDIA</b>	Use large quantities of water. Water will turn pink to purple if in contact with sodium permanganate. Dike to contain. Do not use dry chemicals, CO <sub>2</sub> Halon <sup>®</sup> or foams.
<b>SPECIAL FIREFIGHTING PROCEDURES</b>	If material is involved in fire, flood with water. Cool all affected containers with large quantities of water. Apply water from as far a distance as possible. Wear self-contained breathing apparatus and full protective clothing.
<b>UNUSUAL FIRE AND EXPLOSION</b>	Powerful oxidizing material. May decompose spontaneously if exposed to heat (135°C / 275°F). May be explosive in contact with certain other chemicals (Section 10). May react violently with finely divided and readily oxidizable substances. Increases burning rate of combustible material. May ignite wood and cloth.

**Section 6 Accidental Release Measures**

<b><u>PERSONAL PRECAUTIONS</u></b>
Personnel should wear protective clothing suitable for the task. Remove all ignition sources and incompatible materials before attempting clean up.
<b><u>ENVIRONMENTAL PRECAUTIONS:</u></b>
Do not flush into sanitary sewer system or surface water. If accidental release into the environment occurs, inform the responsible authorities. Keep the product away from drains, sewers, surface and ground water and soil.
<b><u>STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED</u></b>
Contain spill by collecting the liquid in a pit or holding behind a dam (sand or soil). Dilute to approximately 6% with water, and then reduce with sodium thiosulfate, a bisulfite or ferrous salt solution. The bisulfite or ferrous salt may require some dilute sulfuric acid (10% w/w) to promote reduction. Neutralize with sodium carbonate to neutral pH, if acid was used. Decant or filter and deposit sludge in approved landfill. Where permitted, the sludge may be drained into sewer with large quantities of water. To clean contaminated floors, flush with abundant quantities of water into sewer, if permitted by federal, state, and local regulations. If not, collect water and treat as above.



# LIQUISOL™ Environmental Oxidant

## EC- SAFETY DATA SHEET according to EC directive 2001/58/EC

### MATERIAL SAFETY DATA SHEET

Revision Date: April 2008

Supersedes:

Page 4 of 8

#### Section 7 Handling and Storage

##### WORK/HYGIENIC PRACTICES

Wash hands thoroughly with soap and water after handling permanganate solution. Do not eat, drink or smoke when working with sodium permanganate. Wear proper protective equipment. Remove clothing, if it becomes contaminated.

##### VENTILATION REQUIREMENTS

Provide sufficient mechanical and/or local exhaust to maintain exposure below the TLV/TWA.

##### CONDITIONS FOR SAFE STORAGE

Store in accordance with NFPA 430 requirements for Class II oxidizers. Protect containers from physical damage. Store in a cool, dry area in closed containers. Segregate from acids, peroxides, formaldehyde, and all combustible, organic, or easily oxidizable materials including antifreeze and hydraulic fluid.

#### Section 8 Exposure Controls and Personal Protection

##### RESPIRATORY PROTECTION

In cases where overexposure to mist may occur, the use of an approved NIOSH-MSHA mist respirator or an air supplied respirator is advised. Engineering or administrative controls should be implemented to control mist.

##### EYE

Faceshield, goggles, or safety glasses with side shields should be worn. Provide eyewash in working area.

##### GLOVES

Rubber or plastic gloves should be worn.

##### OTHER PROTECTIVE EQUIPMENT

Chemically resistant clothing covering arms and legs, and rubber, or plastic apron should be worn. **Caution:** If clothing becomes contaminated, wash off immediately. Spontaneous ignition may occur with cloth or paper.

#### Section 9 Physical and Chemical Properties

##### **APPEARANCE AND ODOR**

Dark purple solution, odorless

##### **BOILING POINT, 760 mm Hg**

>101°C

##### **VAPOR PRESSURE (mm Hg)**

760 mm at 105°C

##### **SOLUBILITY IN WATER % BY SOLUTION**

Miscible in all proportions with water

##### **PERCENT VOLATILE BY VOLUME**

61% (as water)

##### **EVAPORATION RATE**

Same as water

##### **FREEZING POINT**

<-4.0 °C

##### **SPECIFIC GRAVITY**

1.33- .139

##### **pH**

5-8

##### **OXIDIZING PROPERTIES**

Strong oxidizer. May ignite wood and cloth.

##### **EXPLOSIVE PROPERTIES**

Explosive in contact with sulfuric acid or peroxides, or readily oxidizable substances.

**LIQUISOL™ Environmental Oxidant**  
**EC- SAFETY DATA SHEET** according to EC directive 2001/58/EC  
**MATERIAL SAFETY DATA SHEET**

Revision Date: April 2008

Supersedes:

Page 5 of 8

**Section 10 Stability and Reactivity**

<b>STABILITY</b>	Under normal conditions, the material is stable.
<b>CONDITIONS TO AVOID</b>	Contact with incompatible materials or heat (135°C / 275°F) could result in violent exothermic chemical reaction.
<b>INCOMPATIBLE MATERIALS</b>	Acids, peroxides, and all combustible organic or readily oxidizable materials including inorganic oxidizable materials and metal powders. With hydrochloric acid, chlorine gas is liberated.
<b>HAZARDOUS DECOMPOSITION PRODUCTS</b>	When involved in a fire, sodium permanganate may form corrosive fumes.
<b>CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION</b>	Material is not known to polymerize.

**Section 11 Toxicological Information**

**SODIUM PERMANGANATE:** Acute oral LD<sub>50</sub> not known.

**1. ACUTE TOXICITY**

Irritating to body tissue with which it comes into contact. No acute toxicity data is available for sodium permanganate. Toxicity is expected to be similar to that of potassium permanganate. The toxicity data for potassium permanganate is given below:

**INGESTION:**

LD 50 oral rat: 780 mg/kg male (14 days); 525 mg/kg female (14 days).

Harmful if swallowed. ALD: 10g. Ingestion may cause nausea, vomiting, sore throat, stomach-ache and eventually lead to a perforation of the intestine. Liver and kidney injuries may occur.

**SKIN CONTACT:**

LD 50 dermal no data available.

Major effects of exposure: severe irritation, brown staining of skin.

**INHALATION:**

LC 50 inhal. no data available.

The product may be absorbed into the body by inhalation. Major effects of exposure: respiratory disorder, cough.

**2. CHRONIC TOXICITY**

No known cases of chronic poisoning due to permanganates have been reported. Prolonged exposure, usually over many years, to heavy concentrations of manganese oxides in the form of dust and fumes may lead to chronic manganese poisoning, chiefly involving the central nervous system.

**3. CARCINOGENICITY**

Sodium permanganate has not been classified as a carcinogen by ACGIH, NIOSH, OSHA, NTP, or IARC.

**4. MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE**

Sodium permanganate solution will cause further irritation of tissue, open wounds, burns or mucous membranes.

**LIQUISOL™ Environmental Oxidant**  
**EC- SAFETY DATA SHEET** according to EC directive 2001/58/EC  
**MATERIAL SAFETY DATA SHEET**

Revision Date: April 2008

Supersedes:

Page 6 of 8

**Section 12 Ecological Information**

<p><b><u>ENTRY TO THE ENVIRONMENT</u></b></p> <p>Permanganate has a low estimated lifetime in the environment, being readily converted by oxidizable materials to insoluble MnO<sub>2</sub>.</p> <p><b><u>BIOCONCENTRATION POTENTIAL</u></b></p> <p>In non-reducing and non-acidic environments, MnO<sub>2</sub> is insoluble and has a very low bioaccumulative potential.</p> <p><b><u>AQUATIC TOXICITY</u></b></p> <p>No aquatic toxicity data is available for sodium permanganate. Toxicity is expected to be similar to that of potassium permanganate. The toxicity data for potassium permanganate is given below:</p> <p>Rainbow trout, 96 hour LC<sub>50</sub> for potassium permanganate: 1.8 mg/L          Bluegill sunfish, 96 hour LC<sub>50</sub> LC50 for potassium permanganate: 2.3 mg/L          Milk fish (Chanos Chanos)/ 96 hour LC<sub>50</sub> LC50 for potassium permanganate: &gt;1.4mg/l</p>
---

**Section 13 Disposal Considerations**

<p><b><u>WASTE DISPOSAL</u></b></p> <p>When it becomes a waste, sodium permanganate is considered a D001 hazardous (ignitable) waste. For disposal of sodium permanganate solutions, follow procedures in Section 6 and deactivate the permanganate to insoluble manganese dioxide. Dispose of it in a permitted landfill. Contact Carus Corporation for additional recommendations.</p>
--

**Section 14 Transport Information**

<p><b>USA (land, D.O.T.) and UN Transport of Dangerous Goods – Model Regulations</b></p>	<p><b>Proper Shipping Name:</b> 49 CFR172.101 Permanganates, inorganic, aqueous solution, n.o.s. (contains sodium permanganate)</p> <p><b>Hazard Class:</b> 49 CFR172.101....Oxidizer</p> <p><b>ID Number:</b> 49 CFR172.101....UN 3214</p> <p><b>Packing Group:</b> 49 CFR172.101....II</p> <p><b>Division:</b> 49 CFR172.101....5.1</p>
<p><b>European Labeling in accordance Road/Rail Transport (ADR/RID)</b></p>	<p><b>ID Number:</b> UN 3214</p> <p><b>ADR/RID Class</b> 5.1</p> <p><b>Description of Goods:</b> Permanganates, inorganic, aqueous solution, n.o.s. (contains sodium permanganate)</p> <p><b>Hazard Identification No.</b> 50</p>
<p><b>European Labeling in accordance with EC directive (Water, I.M.O.)</b></p>	<p><b>Proper Shipping Name:</b> Permanganates, inorganic, aqueous solution, n.o.s. (contains sodium permanganate)</p> <p><b>Hazard Class:</b> Oxidizer</p> <p><b>ID Number:</b> UN 3214</p> <p><b>Packing Group:</b> II</p> <p><b>Division:</b> 5.1</p> <p><b>Marine Pollutant:</b> No</p>
<p><b>European Labeling in accordance with EC directive (Air, I.C.A.O.)</b></p>	<p><b>Proper Shipping Name:</b> Permanganates, inorganic, aqueous solution, n.o.s (contains sodium permanganate)</p> <p><b>Hazard Class:</b> Oxidizer</p> <p><b>ID Number:</b> UN 3214</p> <p><b>Packing Group:</b> II</p> <p><b>Division:</b> 5.1</p>

**LIQUISOL™ Environmental Oxidant**  
**EC- SAFETY DATA SHEET** according to EC directive 2001/58/EC  
**MATERIAL SAFETY DATA SHEET**

Revision Date: April 2008

Supersedes:

Page 7 of 8

**Section 15 Regulatory Information**

**EUROPEAN AND INTERNATIONAL REGULATIONS:**

**MARKINGS ACCORDING TO EU GUIDELINES:**

The product has been classified and marked in accordance with EU directives/ordinances on hazardous materials in Europe.

<u>CHEMICAL NAME</u>	<u>CAS NO.</u>	<u>EINECS</u>	<u>UN NUMBER</u>
Sodium Permanganate	10101-50-5	233-251-1	UN 3214

**CODE LETTER AND HAZARD DESIGNATION OF THE PRODUCT:**



**O**  
Oxidizer



**Xn**  
Harmful



**N**  
Dangerous to the Environment

**RISK PHRASES:**

- 8 Contact with combustibles may cause fire.
- 22 Harmful if swallowed.
- 50/53 Very toxic to aquatic organisms, may cause long-term effects in the aquatic environment.

**SAFETY PHRASES:**

- 17 Keep away from combustible materials.
- 24/25 Avoid contact with skin and eyes.
- 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

**Section 15 Regulatory Information (contd.)**

**US AND INTERNATIONAL CHEMICAL INVENTORY STATUS**

<u>Ingredient</u>	<u>CAS. NO.</u>	<u>TSCA</u>	<u>EC</u>	<u>Japan</u>	<u>Australia</u>	<u>China</u>
Sodium permanganate	10101-50-5	Yes	Yes	Yes	Yes	Yes
<u>Ingredient</u>	<u>CAS. NO.</u>	<u>Korea</u>	<u>DSL</u>	<u>NDSL</u>	<u>PHIL</u>	
Sodium permanganate	10101-50-5		No	Yes		

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulation (CPR, Canada) and the MSDS contains all of the information required by the CPR.



CARUS®  
MSDS # CP-030  
None

**LIQUISOL™ Environmental Oxidant**  
**EC- SAFETY DATA SHEET** according to EC directive 2001/58/EC  
**MATERIAL SAFETY DATA SHEET**

Revision Date: April 2008

Supersedes:

Page 8 of 8

**US FEDERAL, STATE & INTERNATIONAL REGULATIONS**

<u>Ingredient</u>	<u>CAS. NO.</u>	<u>SARA 302</u>		<u>SARA 313</u>			
		<u>RQ</u>	<u>TPQ</u>	<u>List</u>	<u>Chemical Catg.</u>		
Sodium permanganate	10101-50-5	N/A	N/A	No	Yes (Manganese compounds)		
<u>Ingredient</u>	<u>CAS. NO.</u>	<u>CERCLA</u>	<u>RCRA</u>	<u>TSCA 8(d)</u>			
Sodium permanganate	10101-50-5	No	D001	No			
<u>Ingredient</u>	<u>CAS. NO.</u>	<u>CWC</u>	<u>TSCA 12(b)</u>	<u>CDTA</u>	<u>SARA</u>		
Sodium permanganate	10101-50-5	No	No		<u>311/312</u> 4545 Kg		
<u>Ingredient</u>	<u>CAS. NO.</u>	<u>Acute</u>	<u>Chronic</u>	<u>Fire</u>	<u>Pressure</u>	<u>Reactivity</u>	<u>Pure/Liquid</u>
Sodium permanganate	10101-50-5	Yes	Yes	Yes	No	No	Liquid
<u>Ingredient</u>	<u>CAS. NO.</u>	<u>Australian Hazchem Code</u>		<u>Poison Schedule</u>	<u>WHMIS</u>		
Sodium permanganate	10101-50-5				C, D2B		

**Section 16 Other Information**


NIOSH National Institute for Occupational Safety and Health  
MSHA Mine Safety and Health Administration  
OSHA Occupational Safety and Health Administration  
NTP National Toxicology Program  
IARC International Agency for Research on Cancer  
PEL Permissible Exposure Limit  
C Ceiling Exposure Limit  
TLV-TWA Threshold Limit Value-Time Weighted Average  
CAS Chemical Abstract Service  
EINECS Inventory of Existing Chemical Substances (European)

Chithambarathanu Pillai (S.O.F.)  
April 2008

The information contained herein is accurate to the best of our knowledge. However, data, safety standards and government regulations are subject to change and, therefore, holders and users should satisfy themselves that they are aware of all current data and regulations relevant to their particular use of product. CARUS CORPORATION DISCLAIMS ALL LIABILITY FOR RELIANCE ON THE COMPLETENESS OR ACCURACY OR THE INFORMATION INCLUDED HEREIN. CARUS CORPORATION MAKES NO WARRANTY, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR PARTICULAR USE OR PURPOSE OF THE PRODUCT DESCRIBED HEREIN. All conditions relating to storage, handling, and use of the product are beyond the control of Carus Corporation, and shall be the sole responsibility of the holder or user of the product.

CARUS CORPORATION 315 5<sup>TH</sup> STREET, PERU, ILLINOIS 61354



 is a registered service mark of Carus Corporation. LIQUISOL™ is a trademark of Carus Corporation.. CARUS® is a registered trademark of Carus Corporation. Copyright 1998. Responsible Care® is a registered service mark of the American Chemistry Council.