

CARUSOL[®]
Liquid Permanganate
CAS Registry No. 10101-50-5

Fact Sheet

CARUSOL[®] liquid permanganate is an effective oxidant recommended for potable drinking water applications that require a concentrated permanganate solution. Applications include iron and manganese reduction, taste and odor control, disinfection by-product reduction, color reduction, and radium reduction.

Product Specifications

Assay	19.5-21.5% as NaMnO ₄
pH	5.0-8.0
Solubility in Water	Miscible with water in all proportions.

Standards and Specifications

CARUSOL[®] liquid permanganate is certified by the National Sanitation Foundation (NSF) to ANSI/NSF Standard 60: Drinking Water Treatment Chemicals-Health Effects.

CARUSOL[®] meets:
AWWA Standard B603-03

Chemical/Physical Data

Formula	NaMnO ₄
Appearance	Dark Purple Solution
Specific Gravity	1.15-1.17
Freezing Point	21° F

Applications

Drinking Water Purification

- Iron/Manganese Oxidation
- Taste and Odor Control
- Preoxidant for THM and HAA Control
- Hydrogen Sulfide Control
- Color Removal
- Radium Removal

Benefits

- Concentrated liquid oxidant
- More precise dosing of chemical
- Feed equipment is simplified
- Consistent concentration

Shipping Containers

5-gallon (20-L) Jerrican

(UN Specification: UN3H1/Y1.8/100) Made of high density polyethylene (HDPE). Weighs 3.5 lb (1.6 kg). The net weight is 48.5 lbs (22 kg). The jerrican stands approximately 13.4 in. tall, 9.4 in. wide, and 13.0 in. deep (33.9 cm high, 23.8 cm wide, and 33.0 cm deep).

55-gallon (208.2L) Closed head HDPE Drum

(UN Specifications: UN1H1/Y1.9/150) Made of high density polyethylene (HDPE). Weighs 20.5 lb (9.3 kg). The net weight is 533.5 lbs (241.9 kg). The drum stands approximately 35.1 in. tall, has an outside diameter of 23.4 in. (89.1 cm tall, OD 59.4 cm).

275-gallon (1041L) IBC (Intermediate Bulk Container)

(UN Specification: UN31HA1/Y1.9/100) They are also marked "MX" for multi-trip IBC. Weighs 139 lbs (65 kg). The net weight is 2550 lb (1159 kg). The IBC contains 263 gallons of product. The IBC dimensions are 45.4 in. high, 48 in. long, and 40 in. wide. The IBC has a 2" butterfly valve with NPT threads in bottom sump.

Bulk Shipping

Quantities from 3000-4200 gallons are available.

Handling and Storage

Like any strong oxidant, CARUSOL[®] liquid permanganate should be handled with care. Protective equipment during handling should include face shields and/or goggles, rubber or plastic gloves, and rubber or plastic apron. If clothing becomes spotted, was off immediately; spontaneous ignition can occur with cloth or paper. In cases where significant exposure exists use the appropriate NIOSH-MSHA dust or mist respirator is recommended.

Store in accordance with NFPA (National Fire Protection Association) Code 430 requirements for Class II Oxidizers. The product should be stored in a cool, dry area in closed containers. Concrete floors are preferred. Avoid wooden decks. Spillage should be collected and disposed of properly. Contain and dilute spillage 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. Deposit sludge in an approved landfill or, where permitted, drain into sewer with large quantities of water.

As an oxidant, the product itself is non-combustible, but will accelerate the burning of combustible materials. Therefore, contact with all combustible materials and/or chemicals must be avoided. These include but are not limited to: wood, cloth, organic chemicals, and charcoal. Avoid contact with acids,

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peroxides, sulfites, oxalates, and all other oxidizable inorganic chemicals. During contact with hydrochloric acid, chlorine is liberated.

Consult the product MSDS for additional safety related information.

Shipping

CARUSOL[®] liquid permanganate is classified as an oxidizer. Liquid permanganate is shipped domestically as Class 70.

Proper Shipping Name: Permanganates, inorganics, aqueous solution n.o.s (Contains sodium permanganate).

Hazard Class: 5.1

Identification Number: UN 3214

Packaging Group: II

Label Requirements: Oxidizer, 5.1

Packaging Requirements: 49 CFR Parts 171 to 180 Sections: 173.152, 173.202, 173.242.

Carus Value Added

Laboratory Support

Carus Chemical Company has technical assistance available to answer questions, evaluate treatment alternatives, and perform laboratory testing. Our laboratory capabilities include: Consulting, Feasibility Studies, Treatability Studies, and Analytical Services.

Field Services

As an integral part of our technical support, Carus provides extensive on-site treatment assistance. We offer full application services, including technical expertise, supervision, testing, and feed equipment design and installation in order to accomplish a successful evaluation and/or application.

Engineered Systems and Equipment Services

Various options and accessories are available to meet a wide range of applications. Custom-Engineered Feed Systems are complete, pre-engineered, and pre-packaged systems. System designs are customized to meet specific applications and customer needs. CARUSOL[®] liquid permanganate eliminates the need to prepare solutions from dry powder and can be fed with simple dosing pumps.

Carus Chemical Company

During its 90-year history Carus' ongoing emphasis on research and development, technical support, and customer service has enabled the company to become the world leader in permanganate, manganese, oxidation, and base-metal catalyst technologies.

Compatibility Information

CARUSOL[®] liquid permanganate is compatible with many metals and synthetic materials. Natural rubbers and fibers are often incompatible. Solution pH and temperature are also important factors. The material selected for use with liquid permanganate must also be compatible with any kind of acid or alkali being used

In neutral and alkaline solutions, sodium permanganate is not corrosive to carbon steel and 316 stainless steel. However, chloride corrosion of metals may be accelerated when an oxidant such as liquid permanganate is present in solution. Plastics such as Teflon, polypropylene, HDPE and EPDM are also compatible with liquid permanganate.

Aluminum, zinc, copper, lead, and alloys containing these metals maybe be slightly affected by sodium permanganate. Actual corrosion or compatibility studies should be made under the conditions in which the permanganate will be used prior to use.

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