



RemOx® S ISCO reagent has been specifically manufactured for environmental applications such as remediation of soils and associated groundwater. This product can be used to degrade a variety of contaminants including chlorinated solvents, polyaromatic hydrocarbons, phenolics, organo-pesticides, and substituted aromatics. RemOx S is shipped with a certificate of analysis to document assay and trace metals.

REMEDATION GRADE

Assay

≥ 98.8% as KMnO_4

Trace Metals

(see Table I)

CHEMICAL/PHYSICAL DATA

Formula	KMnO_4
Formula Weight	158.0 g/mol
Form	Granular Crystalline
Specific Gravity	
Solid	2.703 g/cm ³
3% Solution	1.020 g/mL by weight, 20° C/ 4° C
Bulk Density	Approximately 100 lb/ft ³
Decomposition may start at	150° C/ 302° F

SOLUBILITY IN DISTILLED WATER

Temperature		Solubility	
°C	°F	g/L	oz/gal
0	32	27.8	3.7
20	68	65.0	8.6
40	104	125.2	16.7
60	140	230.0	30.7
70	158	286.4	38.3
75	167	323.5	43.2

SHIPPING CONTAINERS

25-kg pail (55.125-lb) net, with handle, made of high-density polyethylene (HDPE), weighs 3.1 lbs (1.4 kg). It is tapered to allow nested storage of empty pails, stands approximately 15.5 in (39.4 cm) high and has a maximum diameter of 12 in (30.5 cm). (Domestic and international)

150-kg drum (330.75-lb) net, made of 12-gauge steel, weighs 25.3 lbs (11.5 kg). It stands approximately 28.4 in (72.4 cm) high and with approximately 18.25 in (46.4 cm) inside diameter. (Domestic and international)

SHIPPING CONTAINERS

907-kg FIBC (Flexible Intermediate Bulk Container) (2000-lb) net, (UN13H4/Y/0909), made of woven plastic, coated with inner poly liner. Dimensions are 30 in (76.2 cm) high, 30 in (76.2 cm) long, and 48 in (121.9 cm) wide. The spout diameter is 14 in (35.6 cm) and extends 18 in (45.7 cm) in length. (Domestic only)

1000-MT FIBC (Flexible Intermediate Bulk Container) (2205-lb) net, made of woven plastic, coated with inner poly liner. Dimensions are 30 in high (76.2 cm), 30 in (76.2 cm) long, and 48 in (121.9 cm) wide. The spout diameter is 14 in (35.6-cm) and extends 18 in (45.7-cm) in length. (International only)

Special Packages will be considered upon request.

Packaging meets UN performance-oriented packaging requirements.

DESCRIPTION

Crystals or granules are dark purple with a metallic sheen, sometimes with a dark bronze-like appearance. RemOx S has a sweetish, astringent taste and is odorless.

HANDLING, STORAGE, AND INCOMPATIBILITY

Protect containers against physical damage. When handling RemOx S, European Community (CE) approved respirators should be worn to avoid irritation of, or damage to, mucous membranes. Eye protection should also be worn when handling RemOx S as a solid or in solution.

Store in accordance with NFPA 30 requirements in the United States or the European Fire Protection Association in Europe for Class II oxidizers. Additional regulations in Europe are REACH (Regulation for Registration, Evaluation, Authorisation and Restriction of Chemicals), and CLP (Classification, Labeling, Packaging). REACH is a regulation that increases the responsibility of the industry to manage the risks that the chemical may pose. For REACH registration numbers refer to the eSDS. Check local regulations to ensure proper storage.

RemOx S is stable and will keep indefinitely if stored in a cool, dry area in closed containers. Concrete floors are preferred to wooden decks. To clean up spills and leaks, follow the steps recommended in the MSDS or eSDS. Be sure to use goggles, rubber gloves, and respirator when cleaning up a spill or leak.

CARUS CORPORATION

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HANDLING, STORAGE, AND INCOMPATIBILITY

Avoid contact with acids, peroxides, and all combustible organic or readily oxidizable materials including inorganic oxidizable materials and metal powders. With hydrochloric acid, chlorine gas is liberated. RemOx® S ISCO reagent is not combustible, but it will support combustion. It may decompose if exposed to intense heat. Fires may be controlled and extinguished by using large quantities of water. Refer to the MSDS or eSDS for more information.

SHIPPING

RemOx S is classified by the Hazardous Materials Transportation Board (HMTB) and The European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR), as an oxidizer. It is shipped under Interstate Commerce Commission's (ICC) Tariff 19.

Proper Shipping Name: Potassium Permanganate (RQ-100/45.4)

Hazard Class: Oxidizer, Class 5.1

Identification Number: UN 1490

Division/ADR/RID Class: 5.1

Label Requirements: Oxidizer, 5.1

Packaging Group: II

Packaging Requirements: 49 CFR Parts 100 to 199

Sections: 173.152, 173.153, 173.194

Shipping Limitations:

Minimum quantities:

Rail car: See Tariff for destination

Truck: No minimum

H.S. Code 28.41.61.00

SHIPPING

Postal regulations:

Information applicable to packaging of oxidizers for shipment by the U.S. Postal Service to domestic and foreign destinations is readily available from the local postmaster. United Parcel Service accepts 25 lbs (11.3 kg) as largest unit quantity properly packaged; (consult United Parcel Service). According to ADR Regulation, transportation should not exceed 1.1.3.6. LIMITS, transport category 2, maximum authorized per transport unit, 333 kg. Regulations concerning shipping and packing should be consulted regularly due to frequent changes.

CORROSIVE PROPERTIES

RemOx S 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 must be compatible with either the acid or alkali also being used.

In neutral and alkaline solutions, RemOx S is not corrosive to iron, mild steel, or stainless steel; however, chloride corrosion of metals may be accelerated when an oxidant such as permanganate is present in solution. Plastics such as polypropylene, polyvinyl chloride Type I (PVC I), epoxy resins, fiberglass reinforced plastic (FRP), Penton, Lucite, Viton A, and Hypalon are suitable. Teflon FEP and TFE, and Tefzel ETFE are best. Refer to Material Compatibility Chart.

Aluminum, zinc, copper, lead, and alloys containing these metals may be (slightly) affected by RemOx S solutions. Actual studies should be made under the conditions in which permanganate will be used.

Table I: Typical Trace Metal Content and Specifications

Element	Typical Analysis (mg/kg)	Specifications (mg/kg)	DL* (mg/kg)	Element	Typical Analysis (mg/kg)	Specifications (mg/kg)	DL* (mg/kg)
Ag	BDL	0.40	0.048	Hg	BDL	0.05	0.004
Al	55.85	115.00	0.28	Na	228.03	750	0.069
As	0.04	4.00	0.006	Ni	0.78	5.00	0.048
Ba	10.60	50.00	0.016	Pb	BDL	1.00	0.20
Be	BDL	0.50	0.10	Sb	BDL	1.00	0.20
Cd	BDL	0.10	0.02	Se	BDL	1.00	0.002
Cr	1.60	7.50	0.028	Tl	BDL	5.00	1.00
Cu	0.15	3.00	0.034	Zn	0.87	6.00	0.016
Fe	0.22	100.00	0.066				

DL* = Detection limit BDL = Below detection limit

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