RemOx® S ISCO Reagent
CAS Registry No. 7722-64-7
EINECS No. 231-760-3



FACT SHEET

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 (COA) to document assay, insolubles, weight loss, and trace metals.

REMEDIATION GRADE

Assay
≥ 98.8% as $KMnO_4$

Insolubles
≤ 0.2%

Trace Metals
(see Table 1)

CHEMICAL/PHYSICAL DATA

Formula	$KMnO_4$
Formula Weight	158.0 g/mol
Form	Granular Crystalline
Specific Gravity	
Solid	2.703 g/cm3
3% Solution	1.020 g/mL by weight, 20°C / 4°C
Bulk Density	Approximately 100 lb/ft3

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 HDPE, weighs 3.1-lbs. It is tapered to allow nested storage of empty pails, stands approximately 15½ inches high and has a maximum diameter of 12 inches.

150-kg drum (330.75-lb) net, made of 22-gauge steel, weighs 22.4-lbs. It stands approximately 29½ inches high and is approximately 19¾ inches in diameter.

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, 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.

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. Be sure to use goggles, rubber gloves, and respirator when cleaning up a spill or leak.

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 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 for more information.

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SHIPPING

RemOx® S ISCO reagent is classified by the Hazardous Materials Transportation Board (HMTB) 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
Identification Number: UN 1490
Label Requirements: Oxidizer
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

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 as largest unit quantity properly packaged; (consult United Parcel Service). 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.

APPLICATIONS

RemOx S is used for soil and groundwater remediation by *in-situ* or *ex-situ* chemical oxidation and as an active agent in subsurface reactive barriers for treatment of: Chlorinated ethenes, phenolic compounds, polyaromatic hydrocarbons, TNT, RDX, HMX, and various pesticides.

Table 1: 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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