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.

**REMEDICATION GRADE**

**Assay**

≥ 98.8% as KMnO₄

**Trace Metals**

(see Table 1)

**CHEMICAL/PHYSICAL DATA**

**Formula**

KMnO₄

**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**

<table>
<thead>
<tr>
<th>Temperature</th>
<th>Solubility</th>
</tr>
</thead>
<tbody>
<tr>
<td>°C</td>
<td>°F</td>
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<tr>
<td>0</td>
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<td>20</td>
<td>68</td>
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<td>40</td>
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<tr>
<td>60</td>
<td>140</td>
</tr>
<tr>
<td>70</td>
<td>158</td>
</tr>
<tr>
<td>75</td>
<td>167</td>
</tr>
</tbody>
</table>

**SHIPPING CONTAINERS**

25 kg pail (55.12 lbs) net, with handle, made of high-density polyethylene (HDPE), weighs 2.1 lbs (95 kg). It is tapered to allow nested storage of empty pails, stands approximately 15.6 inches (39.7 cm) high and has a maximum diameter of 12.3 inches (31.2 cm). (Domestic and international)

150 kg drum (330.75 lbs) net, made of 12-gauge steel, weighs 25.3 lbs (11.5 kg). It stands approximately 28.4 inches (72.2 cm) high and is approximately 19.7 inches (50.0 cm) in diameter. (Domestic and international)

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

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.

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.

<table>
<thead>
<tr>
<th>Element</th>
<th>Typical Analysis (mg/kg)</th>
<th>Specifications (mg/kg)</th>
<th>DL* (mg/kg)</th>
<th>Element</th>
<th>Typical Analysis (mg/kg)</th>
<th>Specifications (mg/kg)</th>
<th>DL* (mg/kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ag</td>
<td>BDL</td>
<td>0.40</td>
<td>0.048</td>
<td>Hg</td>
<td>BDL</td>
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<tr>
<td>Al</td>
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<td>Na</td>
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<tr>
<td>As</td>
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<tr>
<td>Ba</td>
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<td>50.00</td>
<td>0.016</td>
<td>Pb</td>
<td>BDL</td>
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<td>0.20</td>
</tr>
<tr>
<td>Be</td>
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<td>0.10</td>
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<td>BDL</td>
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</tr>
<tr>
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<td>Se</td>
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<tr>
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<td>0.028</td>
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<td>BDL</td>
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<td>1.00</td>
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<tr>
<td>Cu</td>
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<td>0.034</td>
<td>Zn</td>
<td>0.87</td>
<td>6.00</td>
<td>0.016</td>
</tr>
</tbody>
</table>
| Fe      | 0.22                     | 100.00                 | 0.066       | DL* = Detection limit BDL = Below detection limit

Table 1: Typical Trace Metal Content and Specifications