During the winter months, many regions of the United States, Canada and Europe experience extended periods of cold days and nights. Our RemOx® L ISCO Reagent sodium permanganate product may be exposed to days of cold temperatures during transportation and storage.

RemOx L ISCO Reagent product is a water solution and may freeze when exposed to cold weather over many hours. This product is freeze/thaw stable and solution strength can be recovered when warmed.

The Permanganate Products Team reminds you that these products contain a small amount of residual potassium ion. When exposed to cold temperatures, small potassium permanganate (KMnO₄) crystals may form. These crystals may precipitate out of solution and settle to the bottom of packages and storage containers due to a decrease in the solubility of potassium permanganate at lower temperatures.

The purple needle-shaped KMnO₄ crystals can appear at the bottom of totes, drums, or pails in transit or during storage when temperatures are below 13 ºC or 55 ºF. The graph below illustrates the solubility of KMnO₄ in 40% sodium permanganate as a function of temperature.

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**SUMMARY**

The information contained herein is accurate to the best of our knowledge. However, data, safety standards and government regulations are subject to change; and the conditions of handling, use or misuse of the product are beyond our control. Carus Corporation makes no warranty, either expressed or implied, including any warranties of merchantability and fitness for a particular purpose. Carus also disclaims all liability for reliance on the completeness or confirming accuracy of any information included herein. Users should satisfy themselves that they are aware of all current data relevant to their particular use(s).

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**TECHNICAL BRIEF**

**RemOx® L ISCO Reagent**

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POTENTIAL SOLUTION
To prevent crystallization, RemOx L ISCO Reagent shipping containers should be stored in a warm building. If bulk and semi-bulk storage tanks, metering pumps, and feed lines are located outside, these should be heat traced and insulated.

One way to limit the potential existence of permanganate crystals in the bottom of the totes or drums is to mix the contents of the totes or drums briefly prior to transferring to mixing tanks to get the permanganate crystals back into solution.

If sodium permanganate has already been transferred to the mixing tank and there are crystals on the bottom of the tank, add water to the container to assist in solubilizing the crystals back into solution.

CAUTION NOTICE
RemOx® L ISCO Reagent Sodium Permanganate

CAUTION:
Exposure to temperatures < 38°F (3°C) may cause potassium permanganate crystals to form. Plugging of small diameter suction lines on metering pumps, particulate screens and check valves is possible.

RemOx® L ISCO Reagent is freeze/thaw stable.

SPECIAL NOTES
This information has been compiled through Quality Control analyses and field data reports and it is meant as a physical-chemical guideline for the use of our customers. It is current and accurate to the best of our knowledge. If you have additional questions or comments, please contact us at salesmkt@caruscorporation.com.