

## Why use Remotox?

- Effective against a broad spectrum of heavy metals and other contaminants of regulatory concern.
- May be applied to in-situ and ex-situ media.
- Converts hexavalent and trivalent chromium to chromium hydroxide in a one step reaction - no need for a separate process.
- Delivers greater persistence and lateral transport away from injection wells because of its slower reaction rates.
- Causes minimal volume increase in soil remediation.
- Numerous applications, especially for Cr(VI), have been successfully conducted at industrial sites over the past 30 years.
- No detrimental impact to the environment and public health and safety observed.
- NSF approved for drinking water treatment, and widely used in agricultural applications to fruit trees, berries and as a soil conditioner.
- Its residues are inert and non-toxic.
- Relatively low cost compared to other reagents.

*For additional information, samples or assistance please contact:*

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# Graus Chemicals

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# Graus Chemicals

## Remotox<sup>®</sup>

For Remediation of Heavy Metals  
Contaminated Soils and  
Groundwater

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# Remotox

Remotox (calcium polysulfide) is an aqueous lime sulfur solution formed by a reaction of calcium hydroxide and sulfur. It is a strong reducing agent consisting of multiple sulfur compounds.

Remotox is routinely used to precipitate metals in wastewater treatment systems. When injected into the ground it causes precipitation of cations as sulfides (FeS, ZnS, PbS, CdS, and CuS) and chromium, unlike the other metals listed, precipitates as hydroxide.

Metal	Arsenic	Lead	Copper	Zinc
	Acid medium only forms various arsenic sulfides; pH>7; arsenic-sulfur compounds are soluble; pH<7 the compounds are insoluble.	Wide Range (pH: 4-9); forms lead sulfide	Close to neutral (Optimal pH: 5-7); forms copper sulfide	Wide range (pH: 4-9); forms zinc sulfide
Metal	Cadmium	Molybdenum	Uranium	Cyanide
	Wide range (pH: 4-9); forms cadmium sulfide	Wide range (pH: 4-9); forms molybdenum sulfide	Wide range (pH: 4-9); forms uranium sulfide	Chemical conversion produces thiocyanate*

(Reference: Groundwater Resources Association of California; Hydro Visions – Volume 10, No. 2; Summer 2001)

\*Thiocyanate can be bio-treated, or it can be treated with lime, producing calcium carbonate, gypsum and ammonia. Chromium (Cr VI) can be treated with calcium polysulfide, and the Cr(VI) is reduced to Cr(III), which is then precipitated as chromium hydroxide.

Remotox has been identified as a reagent suitable for in-situ chemical reduction of multiple contaminants. It is more stable and persistent in subsurface environments than other reductants, and relatively safe to handle in the field. Remotox is a non-toxic reagent that oxidizes under aerobic conditions to form calcium, elemental sulfur and sulfate.

## The Successful Use of Remotox

When mixed with water, Remotox dissociates into bisulfide, aqueous hydrogen sulfide and other sulfur anions, which react to the heavy metals to form less soluble, and non-toxic metal sulfides. Hexavalent chromium (Cr(VI)) is reduced to trivalent chromium (Cr(III)), which then precipitates as chromium hydroxide.

While effective treatment can be achieved over a wide pH range, best results are typically obtained within pH 7-10. Adjustments to pH of the treatment liquids can enhance the metals precipitation process. Application and dosage is dependent on site-specific conditions. Bench and pilot-scale testing is recommended to verify treatability.

## Product Fundamentals

Remotox has a pH of 11-11.5, a specific gravity of 1.27 and is deep orange-red in solution. It is water soluble and comes as 29% (Wt. % CaSx) aqueous solution.

## Storage and Handling

Remotox is available in drums, totes, and in bulk tank trucks. It is not DOT regulated. Compatible materials of construction include stainless steel, polyethylene, polypropylene. Store containers out of direct sunlight at moderate temperature. Do not mix with acids or acidic materials to prevent the formation of hydrogen sulfide gas. Remotox is corrosive due to its caustic nature. Workers are advised to use face shields and gloves to avoid exposure to the skin or eyes.

See Safety Data Sheet for more details regarding safe use of this product, available at [www.grauschemicals.com/technical.html](http://www.grauschemicals.com/technical.html)

