


SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

- 1.1 Product identifier**
 Product Name REMOTOX®
 Chemical Name Calcium Polysulfide Solution
 Chemical Family Inorganic Salt
 CAS-No. 1344-81-6
- 1.2 Recommended use of the substance or mixture**
 Identified Uses Industrial use. Heavy metal fixation reagent.
- 1.3 Details of the supplier of the safety data sheet**
 Company Graus Chemicals, LLC
 P.O. Box 768
 Carefree, AZ 85377
info@grauschemicals.com
- 1.4 Emergency phone number** 1-623-328-5175

SECTION 2: HAZARD(S) IDENTIFICATION

- 2.1 Classification of the substance or mixture**
 Acute toxicity – oral Category 4
 Acute toxicity – dermal Category 4
 Acute toxicity – inhalation Category 4
 Skin corrosion/irritation Category 2
 Eye damage/irritation Category 1
- 2.2 GHS-US labeling**
 Signal word Danger!
- Hazard statement(s)
 H302 Harmful if swallowed.
 H315 Causes skin irritation.
 H318 Causes serious eye damage.
 H332 Harmful if inhaled.
- Symbol(s)

- Precautionary statement(s)
 P221 Take any precaution to avoid mixing with combustibles/acids/oxidizers.
 P261 Avoid breathing dust/fumes/gas/mist/vapors/spray.
 P262 Do not get in eyes, on skin, or on clothing.
 P264 Wash thoroughly after handling.
 P233 Keep containers tightly closed.
 P271 Use only outdoors or in a well-ventilated area.
 P273 Avoid release to the environment – if this is not the intended use.
 P280 Wear protective gloves/eye protection/face shield.
 P501 Dispose of contents/container in accordance with local/regional/national/international regulations.
- Unclassified hazard(s) Aquatic Toxicity
 Unknown toxicity ingredient None

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substance/Mixture

Chemical Name	Synonyms	Formula	CAS No.	EINECS No.	% by weight
Calcium Polysulfide	Lime Sulfur, Calcium Sulfide	CaS _x /KS _x	1344-81-6	215-709-2	26-34
Water	Water	H ₂ O	7732-18-5	231-791-2	Remaining

SECTION 4: FIRST AID MEASURES

4.1 Description of first aid measures

Eye contact	Rinse immediately (the exposed eyes) with lukewarm, gently flowing water for at least 15-20 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get immediate medical advice/attention.
Skin contact	Wash immediately with soap and plenty of water. Rinse for at least 15 minutes. Remove contaminated clothing and wash it before reuse. If skin irritation or rash occurs: Get medical advice/attention.
Ingestion	Drink immediately a small amount of water or milk. Then call a Poison Control Center or doctor/physician right away. Do not induce vomiting unless instructed by poison control or a medical professional.
Inhalation	Remove victim to fresh air and keep at rest in a position comfortable for breathing. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Get immediate medical advice/attention.

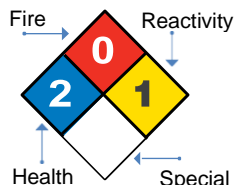
4.2 Most important symptoms and effects both acute and delayed

Acute	Eyes: Symptoms may include burns or irritation to the eyes. Skin: Repeated or prolonged contact may cause dryness, cracking and dermatitis. Inhalation: Symptoms may include irritation to the respiratory tract. Ingestion: Symptoms may include burns or irritation of the gastrointestinal tract. Contact with stomach acid can liberate toxic hydrogen sulfide vapors.
Delayed	No known chronic effects.

SECTION 5: FIRE FIGHTING MEASURES

5.1 Flammable properties

National Fire Protection Association (NFPA) Ratings	
Health	2
Flammability	0
Reactivity	1
Special	-



HAZARD RATING:
4 SEVERE
3 SERIOUS
2 MODERATE
1 SLIGHT
0 MINIMAL

5.2 Suitable extinguishing media

Use firefighting measures that suit the environment.

5.3 Unsuitable extinguishing media

No restrictions known.

5.4 Specific hazards arising from the substance or mixture

Closed/sealed containers may rupture violently when heated. In a fire, the following hazardous materials may be generated: hydrogen sulfide (H₂S) gas.

5.5 Protective equipment or precautions for firefighters

Firefighters should wear self-contained breathing apparatus (SCBA) and full firefighting turnout gear. Keep containers and storage vessels in the fire area cooled with water spray.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions

Wear protective equipment specified in Section 8. Isolate the release area and deny entry to unnecessary personnel.

6.2 Environmental precautions

Avoid release to the environment – if this is not the intended use. Dike spills and stop leakage where practical.

6.3 Methods and materials for containment and cleaning up

Small releases Use absorbent material to collect and contain for salvage or disposal. Clean surface thoroughly to remove residual spill.

Large releases Shut off release if safe to do so. Dike spill area with earth, sand or other inert absorbents to prevent runoff into surface waterways or drains. Recover as much of the released product as possible, using portable pump and hoses, and place into container(s) for later disposal. Following product recovery, flush area with water.

SECTION 7: HANDLING AND STORAGE

7.1 Precautions for safe handling

Wear suitable protective clothing, gloves and eye/face protection. Use only in a well ventilated area. Avoid contact with skin and eyes. Avoid prolonged or repeated breathing of vapors. Wash skin thoroughly after handling.

7.2 Conditions for safe storage, including any incompatibilities

Store in well ventilated area and away from combustibles, acids and oxidizing agents. Keep away from heat. Keep containers tightly closed and store out of direct sunlight at a moderate temperature.

SECTION 8: EXPOSURE CONTROL/PERSONAL PROTECTION

8.1 Occupational exposure limits

No exposure limits noted.

8.2 Engineering controls

Good ventilation should be used. Ventilation rates should be matched to site conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. Provide eyewash station where material is frequently handled.

8.3 Personal protection measures



Eye Protection

Wear chemical goggles/full face shield. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166 (EU).



Skin Protection

Wear neoprene rubber gloves and chemical protection suit to prevent repeated or prolonged contact with material. Use protective clothing tested and approved under appropriate government standards such as NIOSH (US) or Directive 89/686/EEC (EU).



Respiratory Protection

Have self-contained breathing apparatus (SCBA) positive pressure, available in case of accidental release, equipment failure or other unforeseen incidents. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or EN 166 EU.



General Hygiene Considerations

Wash thoroughly after handling and before eating, drinking or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance

Deep red-yellow liquid

Upper/lower flammability limits	Not applicable
Odor	Slight rotten egg odor
Vapor pressure	Not determined
Odor threshold	4.7 ppb (hydrogen sulfide)
Vapor density	Not determined
pH	10.5-11.5
Relative density	1.27 g/cc or 10.6 lbs/gal
Melting point	Not applicable
Freezing point	18-25 °F (-7.7 to -3.9 °C)
Solubility	Completely soluble in water
Initial Boiling point/range	Not determined
Flash point	Not applicable
Evaporation rate	Not determined
Flammability (solid, gas)	Not applicable
Partition coefficient	No data available
Auto ignition temperature	Not applicable
Decomposition temperature	Not determined
Viscosity	2.95 cSt @ 20 °C, 2.5 cSt @ 30 °C

SECTION 10: STABILITY AND REACTIVITY

10.1 Reactivity

Strong oxidizers and acids.

10.2 Chemical stability

Stable under moderate temperature and pressure.

10.3 Possibility of hazardous interactions

Acids, acidic materials, and strong oxidizers cause rapid decomposition, resulting in the formation of H₂S gas.

10.4 Conditions to avoid

Fire, excessive heat and freezing conditions.

10.5 Incompatible materials

Chemical substances: Acids, acidic materials and oxidizing agents. Materials of construction: Copper, carbon steel, aluminum or their alloys (i.e. brass, bronze, etc.).

10.6 Hazardous decomposition products

Hydrogen sulfide and oxides of sulfur.

SECTION 11: TOXICOLOGICAL INFORMATION

Oral	Rat	LD ₅₀ : 820 mg/kg
Dermal	Rabbit	LD ₅₀ : >2,000 mg/kg
Inhalation	Rat	LC ₅₀ : 3.9 mg/l (4 hr exposure) male rat
		LC ₅₀ : 3.1 mg/l (4 hr exposure) female rat
Eye		Primary eye irritation. Possible risk of irreversible effects.
Carcinogenicity		Not listed in NTP, IARC or by OSHA.
Teratology		No data available.
Reproduction		No data available.
Mutagenicity		No data available.

SECTION 12: ECOLOGICAL INFORMATION

12.1 Ecotoxicity

Green Algae	EC ₅₀ : 16.4 mg/l
Water Flea	EC ₅₀ : 13.7 mg/l
Bluegill	LC ₅₀ : 52.9 mg/l
Fathead Minnow	LC ₅₀ : 42.9 mg/l
Rainbow trout	LC ₅₀ : 8.8 mg/l

Honey Bee	LD ₅₀ : >25 µg ai/Bee
Avian	LD ₅₀ : 560 ai/kg
Bobwhite Quail	LD ₅₀ : 560 ai/kg body wt.

12.2 Persistence and degradability

Calcium Polysulfide present in moist soils and/or moist foliage is expected to dissociate rapidly; therefore, run-off and erosion into surface waters, as present calcium polysulfide, should be negligible. (US EPA 2005, RED)

12.3 Bioaccumulation potential

Product is not bio-accumulative.

12.4 Mobility in soil

No data available.

12.5 Other adverse effects

Toxic to aquatic organisms.

SECTION 13: DISPOSAL CONSIDERATION

13.1 Waste treatment methods

Do not contaminate ponds, waterways or ditches with chemical or used container. Dispose of contents/container in accordance with the local/regional/national/international regulations.

SECTION 14: TRANSPORTATION INFORMATION

14.1 Basic shipping information

Proper shipping name	Calcium Polysulfide Solution	<i>(not regulated by US DOT)</i>
DOT Hazard Class	Not applicable	
UN Number	Not applicable	
Packing Group	Not applicable	
Placard(s)	Not applicable	
Labels	Not applicable	
Hazardous Substance	No	
Reportable quantity	No	

14.3 USCG Classification

Not determined

14.4 International Transportation

IMO	UN3082, Environmentally Hazardous Substance, liquid, n.o.s., (Calcium Polysulfide) 9, PG III, MARINE POLLUTANT
IATA	Not regulated
TDG (Canada)	Not regulated
ADR (Europe)	UN3082, Environmentally Hazardous Substance, liquid, n.o.s., (Calcium Polysulfide) 9, PG III, MARINE POLLUTANT

14.5 Emergency Response Guide

Not applicable

14.6 ERAP (Canada)

Not applicable

14.7 Special Precautions

Not applicable

SECTION 15: REGULATORY INFORMATION

15.1 US Federal Regulations

OSHA	Meets the definition of a hazardous substance under the Federal OSHA Hazard Communication Standard (29 CFR 1910.1200).
TSCA	Included in the US EPA TSCA Inventory List.
CERCLA	Reportable quantity: No
SARA Title III	Extremely Hazardous Substance (EHS): No
	Section 312 (Tier II) Ratings: Immediate (acute): Yes
	Fire: No

Sudden release No
 Reactivity: No
 Delayed (chronic) No
 Not applicable

RCRA Section 313 (Form R):
 CAA (HAP): Not applicable
 Not applicable

15.2 State Regulations

CA Prop 65: Not applicable

15.3 International Regulations

WHMIS (Canada) Not determined
 DSL/NDSL (Canada) Listed in NDSL, Record No. 28636

SECTION 16: OTHER INFORMATION

16.1 Use of Substance/Preparation

This material is used for heavy metal removal in soil, groundwater and wastewater. Its use varies depending on the site and remediation technology employed. Therefore, exposure should be evaluated so that appropriate handling practices and training can be established to ensure safe workplace operations.

16.2 Abbreviations

ACGIH	American Conference of Gov. Industrial Hygienists	NDSL	Non-Domestic Substance List (Canada)
ADR	Carriage Dangerous Goods by Road (Europe)	OSHA	Occupational Safety Health Administration
CAA	Clean Air Act	PEL	Permissible Exposure Limit
CAS	Chemical Abstracts Service	RCRA	Resource Conservation and Recovery Act
CERCLA	Comprehensive Environmental Response Compensation and Liability Act	SARA	Superfund Amendments and Reauthorization Act
DSL	Domestic Substance List (Canada)	STCC	Standard Transportation Commodity Act
ERAP	Emergency Response Assistance Plan (Canada)	STEL	Short Term Exposure Limit
HAP	Hazardous Air Pollution	TDG	Transportation of Dangerous Goods
IATA	International Air Transport Association	TLV	Threshold Limit Value
IMO	International Maritime Organization	WHMIS	Workplace Hazardous Materials Information System (Canada)

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