

Ecologix Environmental Systems, LLC



CPS – 29 Metal Precipitant

Handbook

September 2005

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CPS- 29 – Metal Precipitant

OVERVIEW

CPS-29 is an inorganic salt solution with a typical pH of 0.0 – 11.7. The liquid solution is ruby red in color and will have a strong odor of rotten eggs (without odor counter). Solutions of CPS-29 are considered stable in normal transportation. Solution is 29% strength by weight and weigh 10.0 to 10.6 pounds per U.S. gallon (1.198 to 1.318 gm/cc)

The vapor space over CPS-29 solutions is largely water vapor with some hydrogen sulfide.

CPS-29 solutions can be stored in stainless steel tanks as well as fiberglass, non-metallic (poly) and carbon steel lined tanks (See Construction Materials for Storage and Handling).

Personnel handling CPS-29 solutions should wear Personnel Protective Equipment (PPE) to avoid exposure to the skin or eyes (See Handling).

HEALTH HAZARDS

The primary health hazards associated with CPS-29 are irritation of the eyes (eye contact) and gastrointestinal tract (if accidentally ingested). Also inhalation of product vapors containing hydrogen sulfide.

INHALATION

Inhalation of product vapors is predominately water vapor. With small amounts of hydrogen sulfide

SKIN OR EYE CONTACT

Prolonged or repeated skin contact with CPS-29 solutions or mist might cause skin irritation. Eye contact with CPS-29 mist or solution or product vapors may result in redness, pain, conjunctivitis (inflammation of the eyelids) and tears.

INGESTION

Ingestion of CPS-29 will cause irritation of the gastrointestinal tract to include nausea, vomiting and diarrhea.

FIRST AID

Treatment of personnel exposed to solutions of CPS-29 begins with the removal of the victim to an uncontaminated atmosphere. Always wear the correct Personal Protective Equipment (PPE) to avoid exposure to other personnel. SCBA must be worn when rescuing personnel overcome by exposure to product vapors.

INHALATION

Remove the victim from contaminated atmosphere to fresh air. Wear necessary PPE. If victim's breathing is labored, administer oxygen. If breathing has ceased, clear airway and start artificial respiration. If heart has stopped beating, external heart massage should be applied. Obtain immediate medical attention.

SKIN CONTACT

Immediately flush the exposed area with large quantities of water. Remove contaminated clothing under a safety shower. Obtain immediate medical attention.

EYE CONTACT

Immediately flush eyes with large quantities of water for 15 minutes. Hold eyelids open during irrigation to insure thorough flushing of the entire eye and lids with water. Obtain immediate medical attention.

INGESTION

DO NOT INDUCE VOMITING. Immediately give two to four glasses of water to dilute ingested material. Obtain immediate medical attention.

FLAMMABILITY

Solutions of CPS-29 are not flammable. The vapors above a CPS-29 solution are not flammable.

FIRE RESPONSE

If vessels containing CPS-29 are involved in a fire, fire fighting personnel should be equipped with SCBA gear because of the potential of hydrogen sulfide and/or sulfur dioxide vapors. Fire fighting personnel should also be equipped with necessary PPE to prevent skin and eye contact with the solution. Use extinguishing media suitable for the combustible materials involved in the fire. Fire fighting personnel should approach the fire from the upwind direction.

Vessels of CPS-29 should be kept cool with water spray. Be aware that pressurized containers exposed to high heat may rupture from excessive pressure.

STORAGE

For materials of construction used in storage, see "CONSTRUCTION MATERIALS" Section on a later page.

STORAGE TANKS

Locate storage vessels in open, well ventilated areas away from any combustible materials or potential sources of heat. If storage is in a containment area, the containment area should not include storage of flammable products or acidic materials. Storage vessels may be open vent to the atmosphere, pressurized (bullet tanks) or closed from the atmosphere.

Small containers (drums, pails) should be stored in cool, dry, well ventilated areas out of direct sunlight. Small containers, 55 gallon drums or less, can develop high vapor pressures if left exposed to direct sunlight for very long. Such exposure can place the drums integrity in question or expose personnel opening such drums to a sudden pressure release as soon as the drum seal is broken.

Where very low temperatures may be encountered, the tanks should be insulated or heated and/or the product circulated or the piping heat traced. Do not store at temperatures below 40°F (4°C).

HANDLING

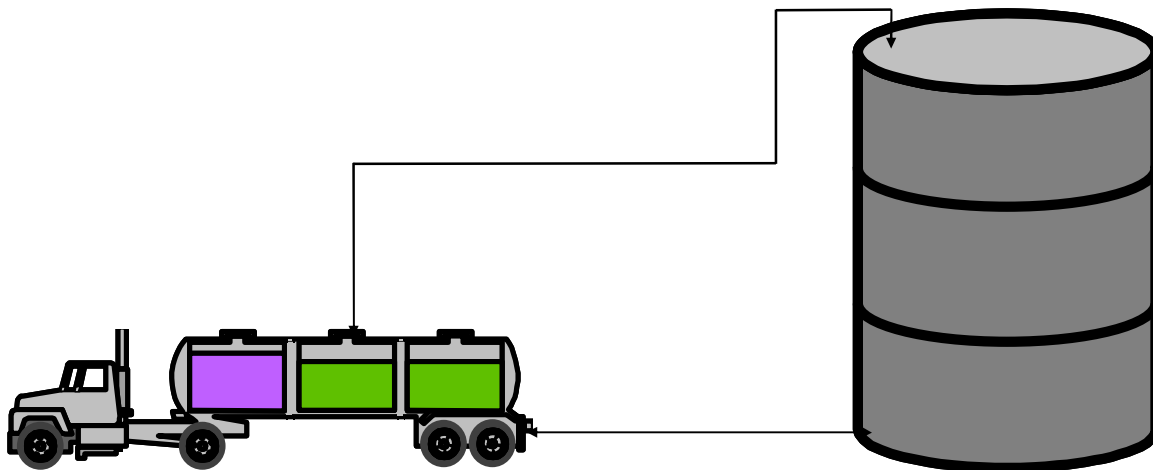
Solutions of CPS-29 should be handled with two criteria in mind. Avoid any solution contact with the skin and/or eyes. Secondly minimize exposure to excessive heat and/or acids or acidic materials to prevent excessive generation of hydrogen sulfide vapors.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

Contact with the skin or eyes can be largely prevented by wearing the correct PPE. For routine handling of small quantities, minimum PPE consists of a Chemical suit, neoprene gloves, chemical goggles and preferably a full-face shield. If duties require opening the dome of a tank truck or railcar containing CPS-29 or work is to be performed near an open storage tank cover, an SCBA or airline supplied respirator, should be worn to prevent personnel exposure to hydrogen sulfide vapors or in case the container lacks sufficient oxygen (i.e., below 19.5%)

TRANSFERS

A vapor return system is advisable for all bulk solution transfers to prevent releasing any vapors to the atmosphere. Carefully inspect all connections (including hoses) which use seals, gaskets or packing to make certain that they are in good condition and correctly positioned prior to starting any transfer. Replace any defective units prior to starting the transfer.



CONSTRUCTION MATERIALS

Copper, brass galvanized materials and carbon steel are not resistant to CPS-29 solutions. These materials of construction should not be used for storage or anywhere in the product handling system (piping, valves and pumps) where they would come in direct contact with CPS-29.

Solutions of CPS-29 are stored in 304 stainless steel, fiberglass, polypropylene, HD polyethylene and lined carbon steel. Consult with tank manufacturers to confirm whether a specific resin is acceptable for CPS-29 service. Drums should be polypropylene, DOT specification of UN1H1/Z1.4.

EQUIPMENT

SAFETY EQUIPMENT

A safety shower complete with eye wash should be located in the immediate area of transfer points and any other locations where there is a possible exposure to the product.

VALVES

Valves will provide good service in CPS-29 use if constructed of 304/316 **Stainless Steel** and utilizing **Teflon** seats or seals. Lead brass, bronze or mercury valve parts should not be used in CPS-29 service.

PIPING

Stainless Steel or PVC is preferable for all applications. Welded and flanged connections are preferred over threaded connections. Schedule 40 piping is typically used for continuous service. Garlock, EPDM, Teflon or flexatallc gaskets are recommended for flanged fittings.

Protection of lines against low temperature will depend upon location of the line, amount of exposure to low temperatures, and whether or not the line will be self-draining. In very cold weather climates piping or tubing in intermittent service should be insulated and electric heat traced. It is a good practice to equip all lines with a steam connection so the lines may be blown out before and after use to insure there are no crystal deposits.

SHIPPING

The Department of Transportation (DOT) has classified CPS-29 as non-hazardous for commercial shipments.

PLACARDING & LABELING

Non-hazardous – not applicable

CONTAINERS

Non-hazardous – not applicable

RELEASES

Personnel responding to releases of CPS-29 must be properly trained in accordance with OSHA's 29 CFR 1910.120, "Hazardous waste operations and Emergency Response". This training is required for releases of CPS-29 of sufficient size to present a health or physical hazard exposure to facility employees. Drips or very small spills which the facility can show (utilizing monitoring) that the amount of CPS-29 released does not represent a health threat to an employee can treat and cleanup the CPS-29 without the above required training. The treatment and cleanup can be done provided the employees involved have been trained on chemical recognition, the hazards of the chemical, the proper PPE required and proper cleanup procedures.

NOTIFICATION

No federal notifications normally required unless release is to a body of water and in sufficient quantities to cause an impact on animal/plant life in the water.

SMALL SPILLS/LEAKS

Absorb with earth, sand, clay, fly ash or other inert commercial sorbents. Dispose of Absorbed material as non-hazardous waste in a chemical waste landfill.

LARGE SPILLS/LEAKS

Confine the spill to qualified personnel. Wear proper protective equipment. Shut off release if safe to do so. Contain the release to as small an area as possible by diking with earth, sand or other available materials. Do not allow product into sewers or drain or discharge into surface waterways because of potential aquatic toxicity. Recover as much of the solution as possible. Handle the remaining material in the same manner as a small release (above).

DISPOSAL CONSIDERATIONS

CPS-29 solutions released to the environment is not listed as a waste nor does it exhibit any waste characteristic to cause it to be classified as a hazardous waste in accordance with 40 CFR 261.

Appendix A

Material Safety Data Sheets

Material Safety Data Sheet

CPS-29 solution

MSDS Number 6100 (Revised: 1/14/05)

Section 1: CHEMICAL PRODUCT and COMPANY IDENTIFICATION

- 1.1 Product Name**..... **CPS-29 solution**
Chemical Family..... Inorganic salt solution
Synonyms..... CPS-29, calcium polysulfide, calcium sulfide, lime sulphur
Formula..... CaS_x + proprietary ingredients
- 1.2 Supplier**..... Ecologix Environmental Systems, LLC
120 Ansley Way
Roswell, Georgia 30075
Information..... (770) 993-8292
- 1.3 Emergency Contact**..... (888) 326-2020
(800) 424-9300 (CHEMTREC)

Section 2: COMPOSITION, INFORMATION ON INGREDIENTS

- 2.1 Chemical Ingredients (% by wt.)**
Calcium Polysulfide+ proprietary ingredients CAS #:1344-81-6 24 - 29%
Water CAS #:7732-18-5 71 - 76%

(See Section 8 for exposure guidelines)

Section 3: HAZARDS IDENTIFICATION

NFPA: Health - 2 Flammability - 0 Reactivity - 1

EMERGENCY OVERVIEW

Warning:

Avoid inhalation of product fumes (hydrogen sulfide) near openings on storage container. Release of the product to the environment may cause the evolution of highly toxic hydrogen sulfide vapors. Product solution is alkaline and may cause irritation to the skin. Eye contact will cause eye irritation and possible corneal damage. Ingestion will result in irritation of tissues and the release of hydrogen sulfide in the gastrointestinal tract.

Section 3: HAZARDS IDENTIFICATION (Cont.)
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3.1 POTENTIAL HEALTH EFFECTS

EYE: Contact with the eyes by product mist or solution will cause irritation and a burning sensation. Eye contact may result in severe corneal injury.

SKIN CONTACT: Contact with product mist or solution will cause skin irritation and may result in corrosion of the skin.

SKIN ABSORPTION: Absorption is unlikely to occur.

INGESTION: Ingestion of product solution will cause irritation and corrosion of the gastrointestinal tract to include nausea, vomiting and diarrhea. Contact with stomach acid will cause highly toxic hydrogen sulfide to evolve.

INHALATION: Inhalation of product vapors (hydrogen sulfide) may cause dizziness and unconsciousness possibly resulting in serious falls from elevated positions.

CHRONIC EFFECTS/CARCINOGENICITY: Not listed as a carcinogen by NTP, IARC or OSHA.

Section 4: FIRST AID MEASURES

4.1 EYES: Immediately flush with large quantities of water for 15 minutes. Hold eyelids apart during irrigation to insure thorough flushing of the entire area of the eye and lids. Obtain immediate medical attention.

4.2 SKIN: Immediately flush with large quantities of water. Remove contaminated clothing under a safety shower. Obtain immediate medical attention.

4.3 INGESTION: DO NOT INDUCE VOMITING. If victim is conscious, immediately give large quantities of water. If vomiting does occur, continue to give fluids. Obtain immediate medical attention.

4.4 INHALATION: Remove victim from contaminated atmosphere. If breathing is labored, administer oxygen. If breathing has ceased, clear airway and start mouth to mouth resuscitation. If heart has stopped beating, external heart massage should be applied. Obtain immediate medical attention.

Section 5: FIRE FIGHTING MEASURES

5.1 FLAMMABLE PROPERTIES

FLASH POINT: Not flammable (See Section 5.4)

METHOD USED: NA

5.2 FLAMMABLE LIMITS H₂S LFL: 4% UFL: 44%

5.3 EXTINGUISHING MEDIA: Water spray or foam or as appropriate for combustibles involved in fire.

Section 5: FIRE FIGHTING MEASURES (Cont.)

5.4 FIRE & EXPLOSIVE HAZARDS: When heated or diluted, hydrogen sulfide vapors will evolve. This gas may form explosive mixtures with air. (See Section 5.2) Keep containers/storage vessels in fire area cooled with water spray.

5.5 FIRE FIGHTING EQUIPMENT: Because of the possible presence of toxic gases and the irritating nature of the product, wear self-contained breathing apparatus, positive pressure, (MSHA/NIOSH approved or equivalent) and full protective gear.

Section 6: ACCIDENTAL RELEASE MEASURES

6.1 Small releases: Confine and absorb small releases on sand, earth or other inert absorbent. Released material may contain residual sulfides. Spray with weak (~5%) hydrogen peroxide to oxidize sulfides.

6.2 Large releases: Confine area to qualified personnel. Wear proper protective equipment. Shut off release if safe to do so. Dike spill area to prevent runoff into sewers, drains (possible toxic or explosive mixtures) or surface waterways (potential aquatic toxicity). Spray product vapors with fine water spray or mist. Recover as much of the solution as possible. Treat remaining material as a small release (above).

Section 7: HANDLING and STORAGE

7.1 Handling: Handle in enclosed containers to avoid breathing product. Avoid contact with skin and eyes. Dilute only in enclosed containers. Use in a well ventilated area. Wash thoroughly after handling.

7.2 Storage: Store in well ventilated areas in enclosed containers. Do not store combustibles in the area of storage vessels. Keep away from any sources of heat or flame. Store tote, drums and small containers out of direct sunlight at moderate temperatures [$<90^{\circ}\text{F}$ (32°C)]. (See Section 10.4 for materials of construction)

Section 8: EXPOSURE CONTROLS, PERSONAL PROTECTION

8.1 RESPIRATORY PROTECTION: Wear self-contained breathing apparatus, positive pressure, MSHA/NIOSH (approved or equivalent).

8.2 SKIN PROTECTION: Gloves, boots, and chemical suit should be worn to prevent liquid contact. Wash contaminated clothing prior to reuse. Contaminated shoes cannot be cleaned and should be discarded

8.3 EYE PROTECTION: Chemical goggles and a full face shield.

8.4 EXPOSURE GUIDELINES:

	OSHA	ACGIH
	TWA	TLV
	STEL	STEL
Hydrogen sulfide.....	20 ppm (ceiling)	10 ppm (ceiling)

8.5 ENGINEERING CONTROLS: Use adequate exhaust ventilation to prevent inhalation of product vapors. Maintain eyewash/safety shower in areas where chemical is handled.

Section 9: PHYSICAL and CHEMICAL PROPERTIES

- 9.1 APPEARANCE: Ruby red liquid
- 9.2 ODOR: Strong odor of rotten eggs (without odor counter)
- 9.3 BOILING POINT: Not determined
- 9.4 VAPOR PRESSURE: Not determined (Believed to be minimal)
- 9.5 VAPOR DENSITY: Not determined
- 9.6 SOLUBILITY IN WATER: Dissolves with precipitation of elemental sulfur.
- 9.7 SPECIFIC GRAVITY: 1.20 - 1.27 (10.0 - 10.6 lbs/gal)
- 9.8 FREEZING POINT: Not determined
- 9.9 pH: 1 0.0 - 11.7
- 9.10 VOLATILE: Not applicable

Section 10: STABILITY and REACTIVITY

10.1 STABILITY: This is a stable material

10.2 HAZARDOUS POLYMERIZATION: Will not occur.

10.3 HAZARDOUS DECOMPOSITION PRODUCTS: Heating this product will evolve hydrogen sulfide vapors. Continued heating will also cause oxides of sulfur to be released.

10.4 INCOMPATIBILITY: Strong oxidizers such as nitrates, nitrites or chlorates can cause explosive mixtures if heated to dryness. Acids, acidic materials or dilution with water will cause the release of hydrogen sulfide, a highly toxic gas.

Section 11: TOXICOLOGICAL INFORMATION

11.1 ORAL: Data not available

11.2 DERMAL: Data not available

11.3 INHALATION: INH-Rat LC₅₀: 3.6 mg/L (4 Hr. Exposure)

11.4 CHRONIC/CARCINOGENICITY: No evidence available

11.5 TERATOLOGY: Data not available

11.6 REPRODUCTION: Data not available

11.7 MUTAGENICITY: Data not available

Section 12: ECOLOGICAL INFORMATION

No data available.

Section 13: DISPOSAL CONSIDERATIONS

If released to the environment for other than its intended purpose, this product should be checked to see it meets the criteria of a reactive sulfides D003, Reactive waste.

Section 14: TRANSPORT INFORMATION

14.1 DOT Shipping Name: CPS-29 solution

14.2 DOT Hazard Class: NA

14.3 UN/NA Number: NA

14.4 Packing Group: NA

14.5 DOT Placard: NA

14.6 DOT Label(s): NA

- 14.7 **IMO Shipping Name:** Not Determined
- 14.8 **RQ (Reportable Quantity):** NA
- 14.9 **RR STCC Number:** Not Determined

Section 15: REGULATORY INFORMATION

15.1 **OSHA:** This product is listed as a hazardous material under criteria of the Federal OSHA Hazard Communication Standard, 29 CFR 1910.1200.

15.2 **SARA TITLE III:**

- a. **EHS (Extremely Hazardous Substance) List:** No
- b. Section 311/312, (Tier I,II) Categories: Immediate (acute) Yes
 Fire No
 Sudden release No
 Reactivity Yes
 Delayed (chronic) No
- c. Section 313 (Toxic Release Reporting-Form R): No

<u>Chemical Name</u>	<u>CAS Number</u>	<u>Concentration</u>
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- d. **TPQ (Threshold Planning Quantity):** No

15.3 **CERCLA/SUPERFUND:** RQ (Reportable Quantity) No

15.4 **TSCA (Toxic Substance Control Act) Inventory List:** Yes

Section 15: REGULATORY INFORMATION (Cont.)

15.5 **RCRA (Resource Conservation and Recovery Act) Status:**Possible D003
 (See Section 13)

15.6 **WHMIS (Canada) Hazard Classification:** NA

15.7 **DOT Hazardous Material:** (See Section 14) No

15.8 **CAA Hazardous Air Pollutant (HAP)** No

Section 16: OTHER INFORMATION

REVISIONS: The entire MSDS was reformatted to comply to ANSI Standard Z400.1- 2005, Ecologix Environmental Systems, LLC

Section 8.3, Eye Protection revised and logo revised, 4/29/02
Revised Section 2.1, Ingredients, 3, Hazard Identification, 9, Physical characteristics, 11, Toxicological Information, 14, Transportation, 1/14/05

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