

Praxair Material Safety Data Sheet

1. Chemical Product and Company Identification

Product Name: Copper-Ammonia Reagent (MSDS No. P-4897-D)	Trade Names: Copper-Ammonia Reagent
Chemical Name: Solution of water, soluble starch, copper (II) sulfate pentahydrate, and ammonium hydroxide	Synonyms: Part No. 5728-7200
Chemical Family: Not applicable.	Product Grades: None assigned.
Telephone: Emergencies: 1-800-645-4633* CHEMTREC: 1-800-424-9300* Routine: 1-800-PRAXAIR	Company Name: Praxair, Inc. 39 Old Ridgebury Road Danbury, CT 06810-5113

*Call emergency numbers 24 hours a day only for spills, leaks, fire, exposure, or accidents involving this product. For routine information, contact your supplier, Praxair sales representative, or call 1-800-PRAXAIR (1-800-772-9247).

2. Hazards Identification

EMERGENCY OVERVIEW



WARNING! Toxic, irritating liquid and vapor.

May be harmful if inhaled or swallowed.

Irritates the eyes, skin, and respiratory tract.

May cause liver, kidney, lung, and eye damage.

Self-contained breathing apparatus and protective clothing may be required for rescue workers.

Under ambient conditions, this blue liquid has a pungent, irritating odor.



OSHA REGULATORY STATUS: The components of this mixture are considered hazardous by the OSHA Hazard Communications Standard (29 CFR 1910.1200).

POTENTIAL HEALTH EFFECTS:

Effects of a Single (Acute) Overexposure

Inhalation. Vapor may be irritating, causing nasal discomfort and discharge. Inhalation of mists may result in absorption of potentially harmful amounts of material.

Skin Contact. May irritate the skin causing local redness and possible swelling. Harmful amounts of material may be absorbed if skin contact is prolonged or widespread.

Swallowing. May cause nausea, abdominal pain, diarrhea, and vomiting. May cause possible liver and kidney damage.

Eye Contact. May irritate the eyes, causing excess redness, swelling of the conjunctiva, and excess tearing.

Effects of Repeated (Chronic) Overexposure. This solution contains copper sulfate pentahydrate, associated with occupational liver disease.

Other Effects of Overexposure. May cause an allergic skin reaction and, possibly, pulmonary sensitization in susceptible individuals.

Medical Conditions Aggravated by Overexposure. Absorption of copper by inhalation, ingestion, or skin contact can have adverse effects on persons with Wilson's disease. The irritating properties of this solution may aggravate an existing dermatitis.

CARCINOGENICITY: None of the components of this solution is listed by NTP, OSHA, or IARC.

POTENTIAL ENVIRONMENTAL EFFECTS: None known. For further information, see section 12, Ecological Information.

3. Composition/Information on Ingredients

See section 16 for important information about mixtures.

COMPONENT	CAS NUMBER	CONCENTRATION
Water	7732-18-5	98%
Starch	9005-25-8	< 1%*
Copper (II) sulfate pentahydrate	7758-99-8	< 1%*
Ammonium hydroxide	1336-21-6	< 2%*

*The symbol > means "greater than."

4. First Aid Measures

INHALATION: Remove to fresh air. Call a physician if symptoms persist or if a large amount of mist has been inhaled.

SKIN CONTACT: Remove contaminated clothing and shoes and wash skin with plenty of soap and water. Wash clothing before reuse. If irritation persists or if contact was prolonged, call a physician.

SWALLOWING: If victim is conscious and alert, give at least two glasses of milk or water and induce vomiting. Never give anything by mouth to an unconscious, convulsive, or unresponsive person. Call a physician.

EYE CONTACT: Immediately flush eyes thoroughly with plenty of water and continue for at least 15 minutes. Hold the eyelids open and away from the eyeballs to ensure that all surfaces are flushed thoroughly. See a physician, preferably an ophthalmologist, if discomfort persists.

NOTES TO PHYSICIAN: *In cases of massive exposure, chelation with EDTA (ethylenediaminetetra- acetic acid) may be helpful to reduce toxic effects of absorbed copper.*

5. Fire Fighting Measures

FLAMMABLE PROPERTIES: Copper-ammonia reagent cannot catch fire.

SUITABLE EXTINGUISHING MEDIA: Use media appropriate for surrounding fire.

PRODUCTS OF COMBUSTION: Not applicable. Products of thermal decomposition include sulfur oxides, ammonia, and/or nitrogen oxides. (See section 10.)

PROTECTION OF FIREFIGHTERS: WARNING! Toxic, irritating liquid and vapor. Evacuate all personnel from danger area. Wear self-contained breathing apparatus where needed. Immediately deluge containers with water spray from maximum distance until cool; then move

them away from fire area if without risk. On-site fire brigades must comply with OSHA 29 CFR 1910.156.

Specific Physical and Chemical Hazards. Heat of fire may build pressure in container, causing rupture. No part of a container should be subjected to temperatures above 125°F (52°C).

Protective Equipment and Precautions for Firefighters. Firefighters should wear self-contained breathing apparatus and full fire-fighting turnout gear.

6. Accidental Release Measures

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:

WARNING! Toxic, irritating liquid and vapor.

Personal Precautions. Do not get on skin, in eyes, or on clothing. Keep personnel away. Wear self-contained breathing apparatus where needed. Use solid absorbent to pick up spilled material. Ventilate area of spill, or move leaking container to a well-ventilated area. Prevent runoff from contaminating surrounding environment.

Environmental Precautions. Prevent waste from contaminating the surrounding environment. Keep personnel away. Discard any product, residue, disposable container, or liner in an environmentally acceptable manner, in full compliance with federal, state, and local regulations. If necessary, call your local supplier for assistance.

7. Handling and Storage

PRECAUTIONS TO BE TAKEN IN HANDLING: Do not get liquid or vapor in eyes, on skin, or on clothing. Have safety showers and eyewash fountains immediately available to exposed workers. Wash thoroughly after handling. Protect containers against physical damage. Wash thoroughly after handling.

PRECAUTIONS TO BE TAKEN IN STORAGE: Store in a cool, dry, well-ventilated area. Keep container closed when not in use and when empty.

8. Exposure Controls/Personal Protection

COMPONENT	OSHA PEL	ACGIH TLV-TWA (2008)
Water	None currently established	None currently established
Starch	15 mg/m ³ total dust 5 mg/m ³ respirable dust	10 mg/m ³ total dust
Copper (II) sulfate pentahydrate	Dusts & mists, as Cu 1 mg/m ³	Dusts & mists, as Cu 1 mg/m ³
Ammonium hydroxide	50 ppm (ammonia)	25 ppm TWA, 35 ppm STEL (ammonia)

TLV-TWAs should be used as a guide in the control of health hazards and not as fine lines between safe and dangerous concentrations.

IDLH = Not available.

ENGINEERING CONTROLS:

Local Exhaust. Use local exhaust ventilation with sufficient air flow velocity to keep ammonia concentrations below the applicable exposure limits in the worker's breathing zone.

Mechanical (General). Not recommended as a primary ventilation system to control worker's exposure.

Special. None

Other. None

PERSONAL PROTECTIVE EQUIPMENT:

Skin Protection. Wear neoprene or nitrile gloves. Select in accordance with OSHA 29 CFR 1910.132. Protective clothing where needed. Select in accordance with OSHA 29 CFR 1910.132 and 1910.133. Regardless of protective equipment, never touch live electrical parts.

Eye/Face Protection. Select in accordance with OSHA 29 CFR 1910.133.

Respiratory Protection. A respiratory protection program that meet OSHA 29 CFR 1910.134, ANSI Z88.2, or MSHA 30 CFR 72.710 (where applicable) requirements must be followed whenever workplace conditions warrant respirator use. Use an air-supplied or air-purifying cartridge if the action level is exceeded. Ensure the respirator has the appropriate protection factor for the exposure level. If cartridge type respirators are used, the cartridge must be appropriate for the chemical exposure (e.g., an organic vapor cartridge). For emergencies or instances with unknown exposure levels, use a self-contained breathing apparatus.

9. Physical and Chemical Properties
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APPEARANCE:	Clear, blue liquid
ODOR:	Pungent, irritating
ODOR THRESHOLD:	Not available.
PHYSICAL STATE:	Liquid at normal temperature and pressure
pH:	11.0
FREEZING POINT at 1 atm:	3.2°F (-16°C)
BOILING POINT at 1 atm:	212.9°F (100.5°C)
FLASH POINT (test method):	Not applicable.
EVAPORATION RATE (Butyl Acetate = 1):	Low
FLAMMABILITY:	Nonflammable
FLAMMABLE LIMITS IN AIR , % by volume:	LOWER: Not applicable. UPPER: Not applicable.
VAPOR PRESSURE at 68°F (20°C) and 1 atm:	Approximately 0.3481 psig (18 mm Hg)
VAPOR DENSITY at 70°F (21.1°C) and 1 atm:	Not available.
SPECIFIC GRAVITY (H ₂ O = 1) at 68°/39.2°F (20°/4°C):	1.02
SPECIFIC GRAVITY (Air = 1) at 68°F (20°C) and 1 atm:	<0.59
SOLUBILITY IN WATER 68°F (20°C):	100%
PARTITION COEFFICIENT: n-octanol/water:	Not available.

AUTOIGNITION TEMPERATURE:	Not applicable.
DECOMPOSITION TEMPERATURE:	Not available.
PERCENT VOLATILES BY VOLUME:	100
MOLECULAR WEIGHT:	Not available.
MOLECULAR FORMULA:	Solution of H ₂ O, (C ₆ H ₁₀ O ₅) _n , CuSO ₄ ·5H ₂ O, NH ₄ OH

10. Stability and Reactivity

CHEMICAL STABILITY: Unstable Stable

CONDITIONS TO AVOID: Heat. Solution is stable at normal temperatures and pressures.

INCOMPATIBLE MATERIALS: Water-reactive compounds such as alkali metals, complex hydrides, metal halides, metal hydrides, metal oxides, nonmetal halides and their oxides; oxidizers including nitrates and permanganates; certain base metals: mercury, gold, and silver; certain hydrocarbons: acetylene, hydrazine, and nitromethane

HAZARDOUS DECOMPOSITION PRODUCTS: Thermal decomposition may produce sulfur oxides, ammonia, and/or nitrogen oxides.

POSSIBILITY OF HAZARDOUS REACTIONS: May Occur Will Not Occur

Thermal decomposition may produce sulfur oxides, ammonia, and/or nitrogen oxides.

11. Toxicological Information

ACUTE DOSE EFFECTS: LC₅₀, 1 hr, rat = 7338 ppm; LD₅₀, rat = 350 mg/kg

STUDY RESULTS: None known.

12. Ecological Information

ECOTOXICITY: No known effects.

OTHER ADVERSE EFFECTS: Copper-ammonia reagent does not contain any Class I or Class II ozone-depleting chemicals.

13. Disposal Considerations

WASTE DISPOSAL METHOD: Do not attempt to dispose of residual or unused quantities. Return cylinder to supplier.

14. Transport Information

DOT/IMO SHIPPING NAME: Not regulated.

HAZARD CLASS:	PACKING GROUP/Zone:	IDENTIFICATION NUMBER:	PRODUCT RQ:
NA*	NA	NA	1000 lb (454 kg), ammonium hydroxide

SHIPPING LABEL(s): NA

PLACARD (when required): NA

*NA-Not applicable

MARINE POLLUTANTS: Copper sulfate hydrates are listed as marine pollutants by DOT.

15. Regulatory Information

The following selected regulatory requirements may apply to this product. Not all such requirements are identified. Users of this product are solely responsible for compliance with all applicable federal, state, and local regulations.

U.S. FEDERAL REGULATIONS:

EPA (ENVIRONMENTAL PROTECTION AGENCY)

CERCLA: COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT OF 1980 (40 CFR Parts 117 and 302):

Reportable Quantity (RQ): The ammonium hydroxide component is reportable in quantities of 1000 lb (454 kg) or greater.

SARA: SUPERFUND AMENDMENT AND REAUTHORIZATION ACT:

SECTIONS 302/304: Require emergency planning based on Threshold Planning Quantity (TPQ) and release reporting based on Reportable Quantities (RQ) of Extremely Hazardous Substances (EHS) (40 CFR Part 355):

TPQ: None

EHS RQ (40 CFR 355): None

SECTIONS 311/312: Require submission of MSDSs and reporting of chemical inventories with identification of EPA hazard categories. The hazard categories for this product are as follows:

IMMEDIATE: Yes

PRESSURE: No

DELAYED: Yes

REACTIVITY: No

FIRE: No

SECTION 313: Requires submission of annual reports of release of toxic chemicals that appear in 40 CFR Part 372.

Ammonium hydroxide and mixtures containing it are subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA) and 40CFR Part 372.

40 CFR 68: RISK MANAGEMENT PROGRAM FOR CHEMICAL ACCIDENTAL RELEASE PREVENTION: Requires development and implementation of risk management programs at facilities that manufacture, use, store, or otherwise handle regulated substances in quantities that exceed specified thresholds.

None of the components of this solution are listed as regulated substances.

TSCA: TOXIC SUBSTANCES CONTROL ACT: The components of this solution are listed on the TSCA inventory.

OSHA: OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION:

29 CFR 1910.119: PROCESS SAFETY MANAGEMENT OF HIGHLY HAZARDOUS CHEMICALS: Requires facilities to develop a process safety management program based on Threshold Quantities (TQ) of highly hazardous chemicals.

None of the components of this solution are listed in Appendix A as highly hazardous chemicals.

STATE REGULATIONS:

CALIFORNIA: None of the components of this solution are listed by California under the SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT OF 1986 (Proposition 65).

PENNSYLVANIA: The components of this solution are subject to the PENNSYLVANIA WORKER AND COMMUNITY RIGHT-TO-KNOW ACT (35 P.S. Sections 7301-7320).

16. Other Information

Be sure to read and understand all labels and instructions supplied with all containers of this product.

OTHER HAZARDOUS CONDITIONS OF HANDLING, STORAGE, AND USE: *Toxic, irritating liquid and vapor.* Keep container closed when not in use, even when empty.

NOTE: *Prior to using any plastics, confirm their compatibility with the components of this solution.*

MIXTURES: When you mix two or more chemicals, you can create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you produce the mixture. Consult an industrial hygienist or other trained person when you evaluate the end product. Remember, solids, liquids, and vapors have properties that can cause serious injury or death.

HAZARD RATING SYSTEMS:

NFPA RATINGS:

HEALTH	= 2
FLAMMABILITY	= 0
INSTABILITY	= 0
SPECIAL	= None

HMIS RATINGS:

HEALTH	= 2
FLAMMABILITY	= 0
PHYSICAL HAZARD	= 0

Praxair asks users of this product to study this MSDS and become aware of product hazards and safety information. To promote safe use of this product, a user should (1) notify employees, agents, and contractors of the information in this MSDS and of any other known product hazards and safety information, (2) furnish this information to each purchaser of the product, and (3) ask each purchaser to notify its employees and customers of the product hazards and safety information.

The opinions expressed herein are those of qualified experts within Praxair, Inc. We believe that the information contained herein is current as of the date of this Material Safety Data Sheet. Since the use of this information and the conditions of use of the product are not within the control of Praxair, Inc., it is the user's obligation to determine the conditions of safe use of the product.

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Praxair, Inc.
39 Old Ridgebury Road
Danbury, CT 06810-5113