

Praxair Material Safety Data Sheet

1. Chemical Product and Company Identification

Product Name: Copper-Ammonia Reagent (MSDS No. P-4897-C)		Trade Name: Copper-Ammonia Reagent	
Chemical Name: Solution of water, soluble starch, copper (II) sulfate pentahydrate, and ammonium hydroxide		Synonyms: Part No. 5728-7200	
Formula: Solution of H ₂ O, (C ₆ H ₁₀ O ₅) _n , CuSO ₄ ·5H ₂ O, & NH ₄ OH		Chemical Family: Not applicable	
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. Composition/Information on Ingredients

See section 16 for important information about mixtures.

INGREDIENT	CAS NUMBER	CONCENTRATION	OSHA PEL	ACGIH TLV-TWA (2004)
Water	7732-18-5	98%	None currently established	None currently established
Starch	9005-25-8	< 1%*	15 mg/m ³ total dust 5 mg/m ³ respirable dust	10 mg/m ³ total dust
Copper (II) sulfate pentahydrate	7758-99-8	< 1%*	Dusts & mists, as Cu 1 mg/m ³	Dusts & mists, as Cu 1 mg/m ³
Ammonium hydroxide	1336-21-6	< 2%*	50 ppm (ammonia)	25 ppm TWA, 35 ppm STEL (ammonia)

**The symbol < means "less than."*

3. 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/must be worn by rescue workers.
Odor: Pungent, irritating

THRESHOLD LIMIT VALUE: See section 2. TLV-TWAs should be used as a guide in the control of health hazards and not as fine lines between safe and dangerous concentrations.

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.

SIGNIFICANT LABORATORY DATA WITH POSSIBLE RELEVANCE TO HUMAN HEALTH HAZARD EVALUATION: None known.

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

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 (ethylenediaminetetraacetic acid) may be helpful to reduce toxic effects of absorbed copper.*

NOTE: *This liquid is used in equipment to determine the purity of gaseous acetylene. Users must be familiar with the operations and hazards associated with the equipment.*

5. Fire Fighting Measures

FLASH POINT (test method):	Not applicable	
AUTOIGNITION TEMPERATURE:	Not applicable	
FLAMMABLE LIMITS IN AIR , % by volume:	LOWER: Not applicable	UPPER: Not applicable
EXTINGUISHING MEDIA: Copper-ammonia reagent cannot catch fire. Use media appropriate for surrounding fire.		

SPECIAL FIRE FIGHTING PROCEDURES: 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.

UNUSUAL FIRE AND EXPLOSION 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).

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

6. Accidental Release Measures

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED: WARNING! Toxic, irritating liquid and vapor. 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.

WASTE DISPOSAL METHOD: 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 STORAGE: Store in a cool, dry, well-ventilated area. Keep container closed when not in use and when empty.

PRECAUTIONS TO BE TAKEN IN HANDLING: Protect containers against physical damage. Wash thoroughly after handling.

8. Exposure Controls/Personal Protection

VENTILATION/ENGINEERING CONTROLS:

LOCAL EXHAUST—Use local exhaust ventilation with sufficient air flow velocity to keep ammonia concentrations below the TLV in the worker's breathing zone.

MECHANICAL (general)—Not recommended as a primary ventilation system to control worker's exposure.

SPECIAL—None

OTHER—None

RESPIRATORY PROTECTION: Use an air-supplied respirator or a full-face, positive-pressure, self-contained breathing apparatus. Respiratory protection must conform to OSHA 29 CFR 1910.134. Select per OSHA 29 CFR 1910.134 and ANSI Z88.2.

SKIN PROTECTION: Wear neoprene or nitrile gloves. Select in accordance with OSHA 29 CFR 1910.132.

EYE PROTECTION: Select in accordance with OSHA 29 CFR 1910.133.

OTHER PROTECTIVE EQUIPMENT: 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.

9. Physical and Chemical Properties

SPECIFIC GRAVITY ($H_2O = 1$) at 68°/39.2°F (20°/4°C):	1.02
SPECIFIC GRAVITY (Air = 1) at 68°F (20°C) and 1 atm:	<0.59
VAPOR PRESSURE at 68°F (20°C) and 1 atm:	Approximately 0.3481 psig (18 mm Hg)
SOLUBILITY IN WATER at 68°F (20°C):	100%
PERCENT VOLATILES BY VOLUME:	100
EVAPORATION RATE (Butyl Acetate = 1):	Low
pH:	11.0
BOILING POINT at 1 atm:	212.9°F (100.5°C)
FREEZING POINT at 1 atm:	3.2°F (-16°C)
APPEARANCE, ODOR, AND STATE: Clear, blue liquid; pungent, irritating odor.	

10. Stability and Reactivity

STABILITY: ☐ Unstable ☒ Stable

INCOMPATIBILITY (materials to avoid): 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.

HAZARDOUS POLYMERIZATION: ☐ May Occur ☒ Will Not Occur

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

11. Toxicological Information

LD₅₀ = 350 mg/kg, rat; LC₅₀ = 7338 ppm, 1 hr, rat (ammonia). See section 3.

12. Ecological Information

Copper-ammonia reagent does not contain any Class I or Class II ozone-depleting chemicals. Copper sulfate hydrates are listed as marine pollutants by DOT.

13. Disposal Considerations

WASTE DISPOSAL METHOD: Dispose of this product in an environmentally acceptable manner in full compliance with federal, state, and local regulations. Do not pour down drains, into sewers, or otherwise release into the environment. Place into lab packs for pickup by a licensed hazardous waste disposal service or use other authorized means. See section 6 for disposal following spills.

14. Transport Information

DOT/IMO SHIPPING NAME: Not regulated

HAZARD CLASS: Not applicable	IDENTIFICATION NUMBER: Not applicable	PRODUCT RQ: 1000 lb (454 kg), ammonium hydroxide
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SHIPPING LABEL(s): Not applicable

PLACARD (when required): Not applicable

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):

Threshold Planning Quantity (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

DELAYED: Yes

PRESSURE: No

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 is listed as a regulated substance.

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 is listed in Appendix A as a highly hazardous chemical.

STATE REGULATIONS:

CALIFORNIA: None of the components of this solution is 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.* 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. 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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