Copper-Ammonia Reagent

Safety Data Sheet P-4897

This SDS conforms to U.S. Code of Federal Regulations 29 CFR 1910.1200, Hazard Communication.

Date of issue: 01/01/1986 Revision date: 10/26/2016 Supersedes: 05/17/2015

SECTION: 1. Product and company identification

1.1. Product identifier

Product form : Mixture

Name : Copper-Ammonia Reagent

Other means of identification : Part No. 5728-7200
Solution of water, soluble starch, copper (II) sulfate pentahydrate, and ammonium hydroxide

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture : Industrial use. Use as directed.

1.3. Details of the supplier of the safety data sheet

Praxair, Inc.
10 Riverview Drive
Danbury, CT 06810-6268 - USA
T 1-800-772-9247 (1-800-PRAXAIR) - F 1-716-879-2146
www.praxair.com

1.4. Emergency telephone number

Emergency number : Onsite Emergency: 1-800-645-4633

CHEMTREC, 24hr/day 7days/week
— Within USA: 1-800-424-9300, Outside USA: 001-703-527-3887
(collect calls accepted, Contract 17729)

SECTION 2: Hazard identification

2.1. Classification of the substance or mixture

GHS-US classification

Skin Irrit. 2 H315
Eye Irrit. 2A H319

2.2. Label elements

GHS-US labeling

Hazard pictograms (GHS-US) :

GHS07

Signal word (GHS-US) : WARNING

Hazard statements (GHS-US) : H315 - CAUSES SKIN IRRITATION
H319 - CAUSES SERIOUS EYE IRRITATION

Precautionary statements (GHS-US) : P264 - Wash exposed skin thoroughly after handling
P280 - Wear protective gloves/protective clothing/eye protection/face protection
P302+P352 - If on skin: Wash with plenty of water
P305+P351+P338 - If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P321 - Specific treatment (see First aid measures on this label)
P332+P313 - If skin irritation occurs: Get medical advice/attention
P337+P313 - If eye irritation persists: Get medical advice/attention
P362 - Take off contaminated clothing and wash before reuse

2.3. Other hazards

No additional information available

2.4. Unknown acute toxicity (GHS US)

No data available

SECTION 3: Composition/Information on ingredients

3.1. Substance

Not applicable

3.2. Mixture

Name	Product identifier	%
Water	(CAS No) 7732-18-5	> 98
Ammonium hydroxide	(CAS No) 1336-21-6	< 2
Sulfuric acid, copper(2+) salt (1:1), pentahydrate	(CAS No) 7758-99-8	< 1
Starch	(CAS No) 9005-25-8	< 1

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures after inhalation : Move to fresh air. Call a physician if symptoms persist or if a large amount of mist has been inhaled.

First-aid measures after skin contact : Remove contaminated clothing. Wash with plenty of soap and water. If irritation persists, consult a doctor.

First-aid measures after eye contact : Immediately flush eyes thoroughly with water for at least 15 minutes. Consult an ophthalmologist if irritation persists.

First-aid measures after ingestion : If patient is fully conscious, give two glasses of milk or water at once. Induce vomiting if victim completely conscious/alert. Never give anything by mouth to an unconscious person.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms/injuries after skin contact : CAUSES SKIN IRRITATION.

Symptoms/injuries after eye contact : CAUSES SERIOUS EYE IRRITATION.

4.3. Indication of any immediate medical attention and special treatment needed

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

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Use extinguishing media appropriate for surrounding fire.

5.2. Special hazards arising from the substance or mixture

Fire hazard : Not flammable.

5.3. Advice for firefighters

Firefighting instructions : **WARNING Irritating liquid and vapor**

Evacuate all personnel from the danger area. Use self-contained breathing apparatus (SCBA) and protective clothing. Immediately cool containers with water from maximum distance. Stop flow of gas if safe to do so, while continuing cooling water spray. Remove ignition sources if safe to do so. Remove containers from area of fire if safe to do so. On-site fire brigades must comply with OSHA 29 CFR 1910.156 and applicable standards under 29 CFR 1910 Subpart L—Fire Protection.

Protection during firefighting : Compressed gas: asphyxiant. Suffocation hazard by lack of oxygen.

Special protective equipment for fire fighters : Standard protective clothing and equipment (Self Contained Breathing Apparatus) for fire fighters.

Other information : Containers are equipped with a pressure relief device. (Exceptions may exist where authorized by DOT.).

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures : **WARNING Irritating liquid and vapor** . Do not get on skin, in eyes, or on clothing. Ventilate area of spill, or move leaking container to a well-ventilated area.

6.1.1. For non-emergency personnel

No additional information available

6.1.2. For emergency responders

No additional information available

6.2. Environmental precautions

Prevent waste from contaminating the surrounding environment. Prevent soil and water pollution. Dispose of contents/container in accordance with local/regional/national/international regulations. Contact supplier for any special requirements.

6.3. Methods and material for containment and cleaning up

For containment : Use solid absorbent to pick up spilled material.

6.4. Reference to other sections

See also sections 8 and 13. See Heading 8. Exposure controls and personal protection.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Protect containers against physical damage

Do not get in eyes, on skin, or on clothing

Provide readily accessible eye wash stations and safety showers

Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work

Keep container closed when not in use.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Store in a cool, well-ventilated place

Store in an area appropriate for chemical solutions.

7.3. Specific end use(s)

None.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Starch (9005-25-8)		
ACGIH	ACGIH TLV-TWA (mg/m³)	10 mg/m³
USA OSHA	OSHA PEL (TWA) (mg/m³)	15 mg/m³ (total dust) 5 mg/m³ (respirable fraction)

8.2. Exposure controls

Appropriate engineering controls : Provide adequate general and local exhaust ventilation. Ensure exposure is below occupational exposure limits (where available). Mechanical (General): Not recommended as a primary ventilation system to control worker's exposure.

Hand protection : Nitrile rubber (NBR) /. Neoprene rubber (HNBR) /.

Eye protection : Select eye protection in accordance with OSHA 29 CFR 1910.133.

Skin and body protection : Select per OSHA 29 CFR 1910.132, 1910.136, and 1910.138.

Respiratory protection : When workplace conditions warrant respirator use, follow a respiratory protection program that meets OSHA 29 CFR 1910.134, ANSI Z88.2, or MSHA 30 CFR 72.710 (where applicable). Use an air-supplied or air-purifying cartridge if the action level is exceeded. Ensure that 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. For emergencies or instances with unknown exposure levels, use a self-contained breathing apparatus (SCBA). Self contained breathing apparatus (SCBA) or positive pressure airline with mask are to be used in oxygen-deficient atmospheres.

Other information : Do not eat, drink or smoke during use.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	:	Liquid
Color	:	Blue
Odor	:	Irritating Pungent
Odor threshold	:	No data available
pH	:	11
Relative evaporation rate (butyl acetate=1)	:	No data available
Relative evaporation rate (ether=1)	:	Not applicable.
Melting point	:	No data available
Freezing point	:	-16 °C (3.2 °F)
Boiling point	:	100.5 °C (212.9 °F)
Flash point	:	No data available
Auto-ignition temperature	:	No data available
Decomposition temperature	:	No data available
Flammability (solid, gas)	:	No data available
Vapor pressure	:	0.024 bar (0.3481 psig)
Relative vapor density at 20 °C	:	No data available
Relative density	:	1.02 (Water = 1) (at 20°/4°C (68°/39.2°F))
Solubility	:	Water: No data available
Log Pow	:	Not applicable.
Log Kow	:	Not applicable.
Viscosity, kinematic	:	Not applicable.
Viscosity, dynamic	:	Not applicable.
Explosive properties	:	Not applicable.
Oxidizing properties	:	None.
Explosion limits	:	No data available

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

No additional information available

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

May occur.

10.4. Conditions to avoid

Heat.

10.5. Incompatible materials

Water reactive compounds such as. Alkali metals. Complex hydrides. Metal hydrides, flammable, n.o.s. Metal halides. Metal oxides. non-metal halides. and their oxides. Oxidizing agents. Nitrates. Permanganates. Gold, silver, mercury. Acetylene. Hydrazine. Nitromethane.

10.6. Hazardous decomposition products

No additional information available

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Not classified

Water (7732-18-5)	
LD50 oral rat	> 90 ml/kg

Sulfuric acid, copper(2+) salt (1:1), pentahydrate (7758-99-8)	
LD50 oral rat	960 mg/kg
ATE US (oral)	960.000 mg/kg body weight

Ammonium hydroxide (1336-21-6)	
LD50 oral rat	350 mg/kg
ATE US (oral)	350.000 mg/kg body weight

Skin corrosion/irritation : CAUSES SKIN IRRITATION.

pH: 11

Serious eye damage/irritation : CAUSES SERIOUS EYE IRRITATION.

pH: 11

Respiratory or skin sensitization : Not classified

Germ cell mutagenicity : Not classified

Carcinogenicity : Not classified

Reproductive toxicity : Not classified

Specific target organ toxicity (single exposure) : Not classified

Specific target organ toxicity (repeated exposure) : Not classified

Aspiration hazard : Not classified

Symptoms/injuries after skin contact : CAUSES SKIN IRRITATION.

Symptoms/injuries after eye contact : CAUSES SERIOUS EYE IRRITATION.

SECTION 12: Ecological information

12.1. Toxicity

Sulfuric acid, copper(2+) salt (1:1), pentahydrate (7758-99-8)	
LC50 fish 1	0.66 - 1.15 mg/l (Exposure time: 96 h - Species: Lepomis macrochirus [semi-static])
EC50 Daphnia 1	0.147 - 0.227 mg/l (Exposure time: 48 h - Species: Daphnia magna [Static])
LC50 fish 2	0.96 - 1.8 mg/l (Exposure time: 96 h - Species: Lepomis macrochirus [static])

Ammonium hydroxide (1336-21-6)	
LC50 fish 1	8.2 mg/l (Exposure time: 96 h - Species: Pimephales promelas)
EC50 Daphnia 1	0.66 mg/l (Exposure time: 48 h - Species: water flea)
EC50 Daphnia 2	0.66 mg/l (Exposure time: 48 h - Species: Daphnia pulex)

12.2. Persistence and degradability

Copper-Ammonia Reagent	
Persistence and degradability	No ecological damage caused by this product. Not established.

12.3. Bioaccumulative potential

Copper-Ammonia Reagent	
Log Pow	Not applicable.
Log Kow	Not applicable.
Bioaccumulative potential	No ecological damage caused by this product. Not established.

12.4. Mobility in soil

Copper-Ammonia Reagent	
Mobility in soil	No data available.

12.5. Other adverse effects

Effect on ozone layer : None

Other information : Avoid release to the environment.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste disposal recommendations : Place into lab packs for pickup by a licensed hazardous waste disposal service or use other authorized means. Do not pour down drains, into sewers, or otherwise release into the environment.

SECTION 14: Transport information

In accordance with DOT

Not regulated for transport

Additional information

Other information : No supplementary information available.

Special transport precautions : Avoid transport on vehicles where the load space is not separated from the driver's compartment. Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency. Before transporting product containers: - Ensure there is adequate ventilation. - Ensure that containers are firmly secured. - Ensure cylinder valve is closed and not leaking. - Ensure valve outlet cap nut or plug (where provided) is correctly fitted. - Ensure valve protection device (where provided) is correctly fitted.

Transport by sea

No additional information available

Air transport

No additional information available

SECTION 15: Regulatory information

15.1. US Federal regulations

Copper-Ammonia Reagent	
SARA Section 311/312 Hazard Classes	Immediate (acute) health hazard Delayed (chronic) health hazard

CAUTION: Sulfuric acid, copper(2+) salt (1:1), pentahydrate is/are not listed on the TSCA inventory. Therefore this product is intended for R&D purposes only. It may not be used to produce any commercial product.

Starch (9005-25-8)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
EPA TSCA Regulatory Flag	XU - XU - indicates a substance exempt from reporting under the Inventory Update Reporting Rule, i.e, Partial Updating of the TSCA Inventory Data Base Production and Site Reports (40 CFR 710(C))

Ammonium hydroxide (1336-21-6)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
CERCLA RQ	1000 lb

15.2. International regulations

CANADA

Water (7732-18-5)
Listed on the Canadian DSL (Domestic Substances List)

Sulfuric acid, copper(2+) salt (1:1), pentahydrate (7758-99-8)

Starch (9005-25-8)
Listed on the Canadian DSL (Domestic Substances List)

Ammonium hydroxide (1336-21-6)
Listed on the Canadian DSL (Domestic Substances List)

EU-Regulations

15.2.2. National regulations
No additional information available

15.3. US State regulations

Copper-Ammonia Reagent()	
U.S. - California - Proposition 65 - Carcinogens List	No
U.S. - California - Proposition 65 - Developmental Toxicity	No
U.S. - California - Proposition 65 - Reproductive Toxicity - Female	No
U.S. - California - Proposition 65 - Reproductive Toxicity - Male	No

Water (7732-18-5)				
U.S. - California - Proposition 65 - Carcinogens List	U.S. - California - Proposition 65 - Developmental Toxicity	U.S. - California - Proposition 65 - Reproductive Toxicity - Female	U.S. - California - Proposition 65 - Reproductive Toxicity - Male	Non-significant risk level (NSRL)
No	No	No	No	

Sulfuric acid, copper(2+) salt (1:1), pentahydrate (7758-99-8)				
U.S. - California - Proposition 65 - Carcinogens List	U.S. - California - Proposition 65 - Developmental Toxicity	U.S. - California - Proposition 65 - Reproductive Toxicity - Female	U.S. - California - Proposition 65 - Reproductive Toxicity - Male	Non-significant risk level (NSRL)
No	No	No	No	

Starch (9005-25-8)				
U.S. - California - Proposition 65 - Carcinogens List	U.S. - California - Proposition 65 - Developmental Toxicity	U.S. - California - Proposition 65 - Reproductive Toxicity - Female	U.S. - California - Proposition 65 - Reproductive Toxicity - Male	Non-significant risk level (NSRL)
No	No	No	No	

Ammonium hydroxide (1336-21-6)				
U.S. - California - Proposition 65 - Carcinogens List	U.S. - California - Proposition 65 - Developmental Toxicity	U.S. - California - Proposition 65 - Reproductive Toxicity - Female	U.S. - California - Proposition 65 - Reproductive Toxicity - Male	Non-significant risk level (NSRL)
No	No	No	No	

Starch (9005-25-8)
U.S. - Massachusetts - Right To Know List U.S. - Pennsylvania - RTK (Right to Know) List

Ammonium hydroxide (1336-21-6)
U.S. - Massachusetts - Right To Know List U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List U.S. - Pennsylvania - RTK (Right to Know) List

SECTION 16: Other information

Other information : PRAXAIR and the Flowing Airstream design are trademarks or registered trademarks of Praxair Technology, Inc. in the United States and/or other countries

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. Before using any plastics, confirm their compatibility with this product

Praxair asks users of this product to study this SDS and become aware of the 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 SDS 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 Safety Data Sheet. Since the use of this information and the conditions of use 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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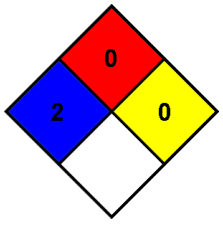
PRAXAIR, the Flowing Airstream design, Medipure, and the Medipure design are trademarks or registered trademarks of Praxair Technology, Inc. in the United States and/or other countries.

NFPA health hazard : 2 - Intense or continued exposure could cause temporary incapacitation or possible residual injury unless prompt medical attention is given.

NFPA fire hazard : 0 - Materials that will not burn.

NFPA reactivity : 0 - Normally stable, even under fire exposure conditions, and are not reactive with water.



HMIS III Rating

Health : 2 Moderate Hazard - Temporary or minor injury may occur

Flammability : 0 Minimal Hazard

Physical : 0 Minimal Hazard

SDS US (GHS HazCom 2012) - Praxair

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.