

Praxair Material Safety Data Sheet

1. Chemical Product and Company Identification

Product Name: Chemicals, n.o.s. (cupric oxide) (MSDS No. P-6217-B)	Trade Names: PCU Catalyst
Chemical Name: Mixture of cupric oxide, palladium, and palladium Oxide	Synonyms: Not applicable.
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



DANGER! Toxic solid.
Harmful or fatal if swallowed.
Harmful if inhaled.

Eye, skin, and respiratory tract irritant.
May damage the lungs, liver, kidneys, and spleen.
Self-contained breathing apparatus and protective clothing
may be required by rescue workers.

Under ambient conditions, this is a black metallic powder with an unknown 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. Irritates the upper respiratory tract. May cause symptoms similar to the common cold such as chills and stuffy nose.

Skin Contact. May irritate the skin, causing itching, discoloration, and inflammation.

Swallowing. May cause an immediate metallic taste, followed by excess salivation, nausea, abdominal (stomach) cramps, vomiting, bloody diarrhea, and anuria (difficulty in urination). Gastric (stomach) ulceration and bleeding may lead to dizziness, weakness, convulsions, coma, and death.

Eye Contact. May irritate eye tissue, producing pain and excess tearing. Conjunctivitis, corneal ulceration and discoloration, and swelling of the eyelids could occur.

Effects of Repeated (Chronic) Overexposure. Prolonged inhalation of dust or mists may cause nasal and, possibly, throat congestion. Occasionally, ulceration and perforation of the nasal septum (the partition between the nostrils) have occurred. With exposure over long periods, atrophy (withering) of nasal mucous membranes has been noted. Inhalation of copper compounds has caused lung and liver damage and hemochromatosis, a metabolic disorder, in animals. Small, repeated doses of nitrates may lead to weakness, general depression, headache, and mental impairment.

Other Effects of Overexposure. None known.

Medical Conditions Aggravated by Overexposure. Inhalation may aggravate asthma and inflammatory or fibrotic pulmonary disease. Because of its irritating properties, this material may aggravate an existing dermatitis. Persons with existing respiratory, liver, skin, kidney, hematopoietic, or Wilson's disease are at increased risk. (Hematopoietic disease affects the manufacture of blood by the body. Wilson's disease is the hereditary inability to metabolize copper.)

CARCINOGENICITY: The components of this product are not 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
Cupric Oxide	1317-38-0	99.5%
Palladium & Palladium Oxide	7440-05-3/1314-08-5	0.5%

4. First Aid Measures

INHALATION: Remove to fresh air. Give artificial respiration if not breathing. If breathing is difficult, qualified personnel may give oxygen. Keep victim warm and at rest. Call a physician.

SKIN CONTACT: Immediately remove contaminated clothing and shoes. Wash affected area with soap or mild detergent and plenty of water until all traces of material is removed (at least 15 minutes). Wash clothing before reuse. Discard shoes and gloves if contaminated on the inside. Call a physician.

SWALLOWING: Immediately give two glasses of water or milk and get immediate emergency medical attention. If victim is not already vomiting, qualified personnel should administer gastric lavage (stomach pumping). Call a physician. If emergency medical aid is not immediately available, contact the poison control center serving your area.

EYE CONTACT: Immediately flush with plenty of water and continue flushing for at least 15 minutes. Hold the eyelids open and away from the eyeballs to ensure that all surfaces are flushed thoroughly. It may be necessary to physically remove solid particles with a swab. Immediately see a physician, preferably an ophthalmologist.

NOTES TO PHYSICIAN: *The following antidote has been recommended for copper poisoning. The decision to administer and prescribed doses should be gauged to the severity of the poisoning. Give calcium disodium edetate 15-25 mg/kg (0.08-0.125 ml of 20% solution per kg of body weight) in 250-500 ml of 5% dextrose intravenously for 1-2 hours twice daily. Maximum*

dosage should not exceed 50 mg/kg/day. Give in 5-day courses with a rest period of at least 2 days between courses. Perform daily urinalyses; reduce dosage if any unusual findings.

Contact the Poison Control Center in your area for additional information on patient management and follow-up.

5. Fire Fighting Measures

FLAMMABLE PROPERTIES: This product cannot catch fire.

SUITABLE EXTINGUISHING MEDIA: This product cannot catch fire. Use media appropriate for surrounding fire.

PRODUCTS OF COMBUSTION: None known.

PROTECTION OF FIREFIGHTERS: DANGER! Toxic solid. Harmful or fatal if swallowed. Avoid breathing vapors or dusts; keep upwind. Wear suitable respiratory protection and protective clothing where needed. Move container away from fire if without risk. On-site fire brigades must comply with OSHA 29 CFR 1910.156.

Specific Physical and Chemical Hazards. None known.

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:

DANGER! Toxic solid.

Personal Precautions. Harmful or fatal if swallowed. Contain spill. Keep personnel away. Prevent any water run-off from entering sewers and water supplies. Wear respiratory protection and protective clothing as needed. Cover spill with dry sand or vermiculite, mix well, and carefully scoop or shovel into a clean dry container for disposal.

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 eat, drink, or smoke in areas of storage or use. Wash hands and face thoroughly before eating, drinking, smoking, applying cosmetics, or using the toilet. Eye and skin irritant. Have safety showers and eyewash fountains available for immediate use. Prohibit consumption of food or beverages in work areas. Limit access to storage and handling areas to trained, authorized personnel. Wash thoroughly after use.

PRECAUTIONS TO BE TAKEN IN STORAGE: Keep container tightly closed. Store in a cool, clean, dry, well-ventilated area away from incompatible materials.

8. Exposure Controls/Personal Protection

COMPONENT	OSHA PEL	ACGIH TLV-TWA (2009)
Cupric Oxide	1 mg/m ³ *	1 mg/m ³ *
Palladium	N.E.**	N.E.**
Palladium Oxide	N.E.**	N.E.**

*Dusts and mists as Cu (ACGIH, 2009)

**N.E.—Not Established.

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 to maintain the concentration of this product below 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 rubber gloves for product handling. Hard hat, safety shoes, rubber boots, rubber apron, and protective clothing. Trousers and sleeves should extend over footwear and gloves. Select in accordance with OSHA 29CFR 1910.132 and 1910.133. Regardless of protective equipment, never touch live electrical parts.

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

APPEARANCE:	Dry black metallic powder
ODOR:	Unknown
ODOR THRESHOLD:	Not available.
PHYSICAL STATE:	Powder at normal temperature and pressure
pH:	Not applicable.
MELTING POINT at 1 atm:	2419°F (1326°C)*
BOILING POINT at 1 atm:	Not applicable.
FLASH POINT (test method):	Not available.
EVAPORATION RATE (Butyl Acetate = 1):	Not available.

FLAMMABILITY:	Nonflammable
FLAMMABLE LIMITS IN AIR, % by volume:	LOWER: Not applicable. UPPER: Not applicable.
VAPOR PRESSURE at 68°F (20°C):	Not available.
VAPOR DENSITY at 70°F (21.1°C) and 1 atm:	Not available.
SPECIFIC GRAVITY (CuO, H ₂ O = 1):	6.3-6.49*
SPECIFIC GRAVITY (Air = 1) at 70°F (21.1°C) and 1 atm:	Not available.
SOLUBILITY IN WATER 68°F (20°C):	Insoluble
PARTITION COEFFICIENT: n-octanol/water:	Not available.
AUTOIGNITION TEMPERATURE:	Not available.
DECOMPOSITION TEMPERATURE:	Not available.
PERCENT VOLATILES BY VOLUME:	Not available.
MOLECULAR WEIGHT:	79.54*
MOLECULAR FORMULA:	Mixture of CuO, Pd, & PdO

*As CuO

10. Stability and Reactivity

CHEMICAL STABILITY: Unstable Stable

CONDITIONS TO AVOID: Moisture, presence of hydrogen. Pd and PdO become reactive on absorption of large quantities of hydrogen.

INCOMPATIBLE MATERIALS: Aluminum, boron, hydrazine, hydrogen, magnesium, potassium, sodium, titanium, zirconium, flammable gases, organic liquids

HAZARDOUS DECOMPOSITION PRODUCTS: Toxic metal fumes may form when heated to decomposition.

POSSIBILITY OF HAZARDOUS REACTIONS: May Occur Will Not Occur

Toxic metal fumes may form when heated to decomposition.

11. Toxicological Information

ACUTE DOSE EFFECTS: LD₅₀, 1 hr, rat (CuO) = 278 mg/kg

STUDY RESULTS: None known.

12. Ecological Information

ECOTOXICITY: No known effects.

OTHER ADVERSE EFFECTS: This product does not contain any Class I or Class II ozone-depleting chemicals.

13. Disposal Considerations

WASTE DISPOSAL METHOD: Dispose of this product in an environmentally acceptable manner in full compliance with federal, state, and local regulations.

14. Transport Information

DOT/IMO SHIPPING NAME: Chemicals, n.o.s. (cupric oxide)

HAZARD CLASS:	PACKING GROUP/Zone:	IDENTIFICATION NUMBER:	PRODUCT RQ:
Nonhazardous material	NA*	Not required	None

SHIPPING LABEL(s): No DOT diamond required.

PLACARD (when required): No DOT diamond required.

*NA = Not applicable.

MARINE POLLUTANTS: This product is not listed as a marine pollutant 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): None

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

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.

The components of this product are not subject to reporting under Section 313.

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.

The components of this product not listed as regulated substances.

TSCA: TOXIC SUBSTANCES CONTROL ACT: The components of this product 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.

The components of this product are not listed in Appendix A as a highly hazardous chemical.

STATE REGULATIONS:

CALIFORNIA: The components of this product are not listed by California under the SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT OF 1986 (Proposition 65).

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

16. Other Information

Read and understand all labels and instructions supplied with all containers of this product.

OTHER HAZARDOUS CONDITIONS OF HANDLING, STORAGE, AND USE: *Toxic solid. Harmful or fatal if swallowed.*

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, chemicals 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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