

## Praxair™ Material Safety Data Sheet

### 1. Chemical Product and Company Identification

<b>Product Name:</b> Chemicals, n.o.s. (cupric oxide) (MSDS No. P-6217)		<b>Trade Name:</b> PCU Catalyst	
<b>Chemical Name:</b> Mixture of Cupric Oxide, Palladium, and Palladium Oxide		<b>Synonyms:</b> Not applicable	
<b>Formula:</b> Mixture of CuO, Pd, & PdO		<b>Chemical Family:</b> Not applicable	
<b>Telephone:</b>	<b>Emergencies:</b> 1-800-645-4633* <b>CHEMTREC:</b> 1-800-424-9300* <b>Routine:</b> 1-800-PRAXAIR	<b>Company Name:</b> 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

For custom mixtures of this product, request an MSDS for each component. See section 16 for important information about mixtures.

INGREDIENT	CAS NUMBER	% BY WT	OSHA PEL	ACGIH TLV-TWA
Cupric Oxide	1317-38-0	99.5%	1 mg/m <sup>3</sup> *	1 mg/m <sup>3</sup> *
Palladium & Palladium Oxide	7440-05-3 1314-08-5	0.5%	None currently established	None currently established

\* Dusts and mists as Cu (ACGIH, 1997)

### 3. Hazards Identification

	<p><b>EMERGENCY OVERVIEW</b></p> <p><b>DANGER! Toxic, black metallic particles and powder.</b>  <b>Harmful or fatal if swallowed.</b>  <b>Harmful if inhaled.</b>  <b>Eye, skin, and respiratory tract irritant.</b>  <b>May damage the lungs, liver, kidneys, and spleen.</b>  <b>Respiratory protection may be required by rescue workers.</b>  <b>Odor: Unknown</b></p>	
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**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– 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.)

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

**CARCINOGENICITY:** The components of PCU Catalyst are not listed by NTP, OSHA, or IARC.

#### 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. (See section 16.)

**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. See a physician, preferably an ophthalmologist, immediately.

**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 two days between courses. Perform daily urinalyses; reduce dosage if any unusual findings.*

### 5. Fire Fighting Measures

<b>FLASH POINT</b> (test method):	Not applicable	
<b>AUTOIGNITION TEMPERATURE:</b>	Not applicable	
<b>FLAMMABLE LIMITS IN AIR, % by volume:</b>	<b>LOWER:</b> Not applicable	<b>UPPER:</b> Not applicable
<b>EXTINGUISHING MEDIA:</b> PCU Catalyst cannot catch fire. Use media appropriate for surrounding fire.		

**SPECIAL FIRE FIGHTING PROCEDURES: WARNING! Toxic black metallic particles and powder. Harmful or fatal if swallowed.** Avoid breathing vapors or dusts; keep upwind. Wear suitable respiratory protection and protective clothing where needed. (See section 8.) Move container away from fire if without risk.

**UNUSUAL FIRE AND EXPLOSION HAZARDS:** None known.

**HAZARDOUS COMBUSTION PRODUCTS:** None known.

### 6. Accidental Release Measures

**STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED: WARNING! Toxic black metallic particles and powder. 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. (See section 8.) Cover spill with dry sand or vermiculite, mix well, and carefully scoop or shovel into a clean dry container for disposal.

**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:** Keep container tightly closed. Store in a cool, clean, dry, well-ventilated area away from incompatible materials. (See section 10.)

**PRECAUTIONS TO BE TAKEN IN HANDLING:** Prohibit consumption of food or beverages in work areas. Limit access to storage and handling areas to trained, authorized personnel. Wash thoroughly after use.

### 8. Exposure Controls/Personal Protection

**VENTILATION/ENGINEERING CONTROLS:**

**LOCAL EXHAUST**—Use local exhaust ventilation with sufficient air flow to maintain the concentration of PCU Catalyst 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 a high-efficiency particle respirator wherever exposure to catalyst dusts is likely. Respiratory protection must conform to OSHA rules as specified in 29 CFR 1910.134.

**SKIN PROTECTION:** Wear rubber glove for product handling.

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

**OTHER PROTECTIVE EQUIPMENT:** 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.

### 9. Physical and Chemical Properties

<b>MOLECULAR WEIGHT (CuO):</b>	79.54
<b>SPECIFIC GRAVITY (CuO, H<sub>2</sub>O = 1):</b>	6.3-6.49
<b>SOLUBILITY IN WATER:</b>	Insoluble
<b>MELTING POINT at 1 atm (CuO):</b>	2419°F (1326°C)
<b>APPEARANCE, ODOR, AND STATE:</b> Dry black metallic powder; odor unknown.	

### 10. Stability and Reactivity

**STABILITY:**  Unstable  Stable

**INCOMPATIBILITY (materials to avoid):** Aluminum, boron, hydrazine, hydrogen, magnesium, potassium, sodium, titanium, zirconium; flammable gases; organic liquids

**HAZARDOUS DECOMPOSITION PRODUCTS:** None known.

**HAZARDOUS POLYMERIZATION:**  May Occur  Will Not Occur

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

### 11. Toxicological Information

LD<sub>Lo</sub> 278 mg/kg intratracheal, rat (CuO)

### 12. Ecological Information

PCU Catalyst does not contain any Class I or Class II ozone-depleting chemicals. Neither component is listed as a marine pollutant 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.

### 14. Transport Information

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

HAZARD CLASS:	IDENTIFICATION NUMBER:	PRODUCT RQ:
Nonhazardous material	Not required	None established

**SHIPPING LABEL(s):** No DOT diamond required.

**PLACARD (when required):** None.

**SPECIAL SHIPPING INFORMATION:** None

### 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 (40 CFR Part 355):

**Threshold Planning Quantity (TPQ):** None.

**Extremely Hazardous Substances (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.

Neither component requires 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.

Neither component is listed as a regulated substance.

**TSCA: TOXIC SUBSTANCES CONTROL ACT:** Both components 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.

Neither component is listed in Appendix A as a highly hazardous chemical.

**STATE REGULATIONS:**

**CALIFORNIA:** Neither component is listed by California under the SAFE DRINKING WATER TOXIC ENFORCEMENT ACT OF 1986 (Proposition 65).

**PENNSYLVANIA:** This product is subject to the PENNSYLVANIA WORKER AND COMMUNITY RIGHT-TO-KNOW ACT (35 P.S. Sections 7301-7320).

<b>16. Other Information</b>
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**OTHER HAZARDOUS CONDITIONS OF HANDLING, STORAGE, AND USE:** *Toxic black metallic particles and powder. Harmful or fatal if swallowed.* 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.

**MIXTURES:** When you mix two or more gases or liquefied gases, 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, gases and liquids have properties that can cause serious injury or death.

**HAZARD RATING SYSTEMS:****NFPA RATINGS:**

HEALTH = 2  
FLAMMABILITY = 0  
REACTIVITY = 0  
SPECIAL = None

**HMIS RATINGS:**

HEALTH = 2  
FLAMMABILITY = 0  
REACTIVITY = 0

**POISON CONTROL CENTER:** Poison Control Centers provide round-the-clock medical information to aid victims of accidental poisoning. Check the emergency listings of your local phone directory for the one serving your area. (Emergency numbers usually appear on inside front cover.) If the poison control center is not listed or you are unable to locate it, contact the largest hospital in your community for the number. Post the number in areas where PCU Catalyst is stored, handled, and used.

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 on 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.

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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 MSDSs are furnished on sale or delivery by Praxair or the independent distributors and suppliers who package and sell our products. To obtain current Praxair MSDSs for these products, contact your Praxair sales representative or local distributor or supplier. If you have questions regarding Praxair MSDSs, would like the form number and date of the latest MSDS, or would like the names of the Praxair suppliers in your area, phone or write the Praxair Call Center (**Phone:** 1-800-PRAXAIR; **Address:** Praxair Call Center, Praxair, Inc., PO Box 44, Tonawanda, NY 14150-7891).

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