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ISO 9001: 2015

MATERIAL SAFETY DATA SHEET

1. Identification

1.1 GHS Product identifier

Copper Nanopowder, APS 200 nm, 99.9%

CodeCN 0145

2. Hazard identification

2.1 Classification of the substance or mixture

Not classified.

2.2 GHS label elements, including precautionary statements

Pictogram(s) No symbol.

Signal word No signal word.

Hazard statement(s) none

Precautionary

statement(s)

Prevention none

Response none

Storage none

Disposal none

2.3 Other hazards which do not result in classification

none

3. Composition/information on ingredients

3.1 Substances

Chemical name	Common names and synonyms	CAS number	EC number	Concentration
copper atom	copper atom	7440-50-8	none	100%

4. First-aid measures

4.1 Description of necessary first-aid measures

General advice

Consult a physician. Show this safety data sheet to the doctor in attendance.

If inhaled

Fresh air, rest. Refer for medical attention.

In case of skin contact

Remove contaminated clothes. Rinse and then wash skin with water and soap.

In case of eye contact

Rinse with plenty of water (remove contact lenses if easily possible).

If swallowed

Rinse mouth. Refer for medical attention.

4.2 Most important symptoms/effects, acute and delayed

Exposure Routes: inhalation, ingestion, skin and/or eye contact Symptoms: Irritation eyes, respiratory system; cough, dyspnea (breathing difficulty), wheezing; [potential occupational carcinogen] Target Organs: Eyes, skin, respiratory system, liver, kidneys (increase(d) risk with Wilson's disease) (NIOSH, 2016)

4.3 Indication of immediate medical attention and special treatment needed, if necessary

Basic treatment: Establish a patent airway. Suction if necessary. Watch for signs of respiratory insufficiency and assist ventilations if necessary. Administer oxygen by nonrebreather mask at 10 to 15 L/min. Monitor for shock and treat if necessary. . . . For eye contamination, flush eyes immediately with water. Irrigate each eye continuously with normal saline during transport. . . . Do not use emetics. For ingestion, rinse mouth and administer 5 ml/kg up to 200 ml of water for dilution if the patient can swallow, has a strong gag reflex, and does not drool. Administer activated charcoal. . . . /Copper and related compounds/

5. Fire-fighting measures

5.1 Extinguishing media

Suitable extinguishing media

Use special powder, dry sand. NO other agents. Water may be ineffective.

5.2 Specific hazards arising from the chemical

no data available

5.3 Special protective actions for fire-fighters

Wear self-contained breathing apparatus for firefighting if necessary.

6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust. For personal protection see section 8.

6.2 Environmental precautions

Personal protection: particulate filter respirator adapted to the airborne concentration of the substance. Sweep spilled substance into covered containers. Carefully collect remainder. Then store and dispose of according to local regulations.

6.3 Methods and materials for containment and cleaning up

1. VENTILATE AREA OF RELEASE. 2. COLLECT SPILLED MATERIAL IN THE MOST CONVENIENT AND SAFE MANNER FOR RECLAMATION, OR FOR DISPOSAL IN A SECURE SANITARY LANDFILL. LIQ CONTAINING COPPER SHOULD BE ABSORBED IN VERMICULITE, DRY SAND, EARTH, OR A SIMILAR MATERIAL. /COPPER DUSTS & MISTS/

7. Handling and storage

7.1 Precautions for safe handling

Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Avoid exposure - obtain special instructions before use. Provide appropriate exhaust ventilation at places where dust is formed. For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

See Chemical Dangers.

8. Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure limit values

Recommended Exposure Limit: 10 Hr Time-Weighted Avg: 1 mg/cu m. /Copper (dusts and mists)/

Biological limit values

no data available

8.2 Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

8.3 Individual protection measures, such as personal protective equipment (PPE)

Eye/face protection

Safety glasses with side-shields conforming to EN166. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Wear impervious clothing. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace. Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands. The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.

Respiratory protection

Wear dust mask when handling large quantities.

Thermal hazards

no data available

9. Physical and chemical properties

Physical state	Raddish powder
Colour	Reddish, lustrous, ductile, malleable metal
Odour	Odorless /Copper dusts and mists/
Melting point/ freezing point	1083\u00baC
Boiling point or initial boiling point and boiling range	2567\u00b0C(lit.)
Flammability	Noncombustible Solid in bulk form, but powdered form may ignite. Combustible.
Lower and upper explosion limit / flammability limit	no data available
Flash point	18\u00b0C
Auto-ignition temperature	no data available
Decomposition temperature	no data available
pH	no data available
Kinematic viscosity	no data available
Solubility	In water:insoluble
Partition coefficient n-octanol/water (log value)	-0.57 (calculated)
Vapour pressure	0 mm Hg (approx) (NIOSH, 2016)
Density and/or relative density	8.94g/mL at 25\u00b0C(lit.)

Relative vapour density no data available
Particle characteristics no data available

10. Stability and reactivity

10.1 Reactivity

no data available

10.2 Chemical stability

BECOMES DULL WHEN EXPOSED TO AIR. IN MOIST AIR GRADUALLY BECOMES COATED WITH GREEN BASIC CARBONATE.

10.3 Possibility of hazardous reactions

COPPER combines violently with chlorine trifluoride in the presence of carbon [Mellor 2, Supp. 1, 1956]. Is oxidized by sodium peroxide with incandescence [Mellor 2:490-93, 1946-1947]. Forms an unstable acetylide when acetylene is passed over samples that have been heated enough to form an oxide coating. Reacts more rapidly in powdered or granular form. Subject to explosive reaction then mixed in finely divided form with finely divided bromates chlorates and iodates of barium, calcium, magnesium, potassium, sodium, or zinc; these reactions are initiated by heat, percussion, and occasionally light friction [Mellor 2:310, 1946-1947]. A solution of sodium azide in copper pipe with lead joints formed copper azide and lead azide, both of these compounds can detonate [Klotz, 1973].

10.4 Conditions to avoid

no data available

10.5 Incompatible materials

Reacts violently with ... ammonium nitrate, bromates, chlorates, iodates, chloride, ... ethylene oxide, ... hydrazine mononitrate, hydrazoic acid, ... and potassium oxide ...

10.6 Hazardous decomposition products

no data available

11. Toxicological information

Acute toxicity

Oral: no data available

Inhalation: no data available

Dermal: no data available

Skin corrosion/irritation

no data available

Serious eye damage/irritation

no data available

Respiratory or skin sensitization

no data available

Germ cell mutagenicity

no data available

Carcinogenicity

Cancer Classification: Group D Not Classifiable as to Human Carcinogenicity

Reproductive toxicity

no data available

STOT-single exposure

no data available

STOT-repeated exposure

no data available

Aspiration hazard

no data available

12. Ecological information

12.1 Toxicity

Toxicity to fish: no data available

Toxicity to daphnia and other aquatic invertebrates: no data available

Toxicity to algae: no data available

Toxicity to microorganisms: no data available

12.2 Persistence and degradability

no data available

12.3 Bioaccumulative potential

no data available

12.4 Mobility in soil

no data available

12.5 Other adverse effects

no data available

13. Disposal considerations

13.1 Disposal methods

Product

The material can be disposed of by removal to a licensed chemical destruction plant or by controlled incineration with flue gas scrubbing. Do not contaminate water, foodstuffs, feed or seed by storage or disposal. Do not discharge to sewer systems.

Contaminated packaging

Containers can be triply rinsed (or equivalent) and offered for recycling or reconditioning. Alternatively, the packaging can be punctured to make it unusable for other purposes and then be disposed of in a sanitary landfill. Controlled incineration with flue gas scrubbing is possible for combustible packaging materials.

14. Transport information

14.1 UN Number

ADR/RID: UN3089 IMDG: UN3089 IATA: UN3089

14.2 UN Proper Shipping Name

ADR/RID: METAL POWDER, FLAMMABLE, N.O.S.

IMDG: METAL POWDER, FLAMMABLE, N.O.S.

IATA: METAL POWDER, FLAMMABLE, N.O.S.

14.3 Transport hazard class(es)

ADR/RID: 4.1 IMDG: 4.1 IATA: 4.1

14.4 Packing group, if applicable

ADR/RID: Not dangerous goods. IMDG: Not dangerous goods. IATA: Not dangerous goods.

14.5 Environmental hazards

ADR/RID: no IMDG: no IATA: no

14.6 Special precautions for user

no data available

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

no data available

15. Regulatory information

15.1 Safety, health and environmental regulations specific for the product in question

Chemical name	Common names and synonyms	CAS number	EC number
copper atom	copper atom	7440-50-8	none
European Inventory of Existing Commercial Chemical Substances (EINECS)			Listed.
EC Inventory			Listed.
United States Toxic Substances Control Act (TSCA) Inventory			Listed.
China Catalog of Hazardous chemicals 2015			Not Listed.
New Zealand Inventory of Chemicals (NZIoC)			Listed.
Philippines Inventory of Chemicals and Chemical Substances (PICCS)			Listed.
Vietnam National Chemical Inventory			Listed.
Chinese Chemical Inventory of Existing Chemical Substances (China IECSC)			Listed.

Section 16: Other Information

This safety data sheet should be used in conjunction with technical sheets. It does not replace them. The information given is based on our knowledge of this product, at the time of publication. It is given in good faith. The attention of the user is drawn to the possible risks incurred by using the product for any other purpose other than that for which it was intended. This does not in any way excuse the user from knowing and applying all the regulations governing his activity. It is the sole responsibility of the user to take all precautions required in handling the product. The aim of the mandatory regulations mentioned is to help the user to fulfill his obligations regarding the use of hazardous products.