a nanowire technology builder

SAFETY DATA SHEET

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: Copper Nanowires B1, Industry Grade

Catalog Number: NovaWire-Cu-B1-IND

Formula: Cu

Diameter: ~ 150 nm
Length: ~ 5 μm

Supplier: Novarials Corporation
800 W Cummings Park, Suite 4600
Woburn, MA 01801

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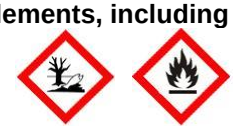
2. HAZARDS IDENTIFICATION

Emergency Overview

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Flammable solids (Category 1), H228
Acute aquatic toxicity (Category 1), H400
Chronic aquatic toxicity (Category 1), H410

GHS Label elements, including precautionary statements

Pictogram 

Signal word Danger

Hazard statement(s)

H228	Flammable solid.
H410	Very toxic to aquatic life with long lasting effects.

Precautionary statement(s)

P210	Keep away from heat/sparks/open flames/hot surfaces. – No smoking.
P240	Ground/bond container and receiving equipment.
P241	Use explosion-proof electrical/ventilating/lighting equipment.
P273	Avoid release to the environment.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P370 + P378	In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction.

P391	Collect spillage.
P501	Dispose of contents/container to an approved waste disposal plant.

NFPA Ratings

Health Hazard:	0
Fire Hazard:	3
Reactivity Hazard:	3

HMIS Ratings

Health Hazard:	0
Chronic Health Hazard:	*
Flammability:	3
Physical Hazard:	3

3. COMPOSITION/INFORMATION ON INGREDIENTS

Synonyms:	Copper
Formula:	Cu
Molecular Weight:	63.55 g/mol

Component		Concentration
Copper		
CAS-No.	7440-50-8	
EC-No.	231-159-6	

4. FIRST AID MEASURES

General advice
Move out of dangerous area. Consult a physician. Show this safety data sheet to the doctor in attendance.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Rinse thoroughly with plenty of water and consult a physician.

If swallowed
Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

5. FIREFIGHTING MEASURES

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Special protective equipment for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

Hazardous combustion products
Hazardous decomposition products formed under fire conditions – Copper Oxide

6. ACCIDENTAL RELEASE MEASURES

Personal precautions
Avoid dust formation. Avoid breathing vapors, mist or gas. Ensure adequate ventilation.
Remove all sources of ignition. Evacuate personnel to safe areas.

Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

Methods and materials for containment and cleaning up
Sweep up and shovel. Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations. Keep in suitable, closed containers for disposal.

7. HANDLING AND STORAGE

Precautions for safe handling
Avoid formation of dust and aerosols.
Provide appropriate exhaust ventilation at places where dust is formed.
Keep away from sources of ignition – No smoking.
Take measurement to prevent the build up of electrostatic charge.

Conditions for safe storage
Keep container tightly closed in a cool, dry and well-ventilated place.

Air sensitive.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Personal protective equipment

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respiration type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Hand protection
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.

Eye/Face protection
Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Body protection
Flame retardant antistatic protective clothing. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Control of environmental exposure

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE	
Form	powder
Color	brown
Safety data	
pH	no data available
Melting point/freezing point	no data available
Boiling point	no data available
Flash point	no data available
Ignition temperature	no data available
Auto ignition temperature	no data available
Lower explosion limit	no data available
Upper explosion limit	no data available
Vapour pressure	no data available
Density	no data available
Water solubility	no data available
Partition coefficient: n-octanol/water	no data available
Relative vapour density	no data available
Odour	no data available
Odour Threshold	no data available
Evaporation rate	no data available

10. STABILITY AND REACTIVITY

Reactivity
no data available

Chemical stability
Stable under recommended storage conditions.

Possibility of hazardous reactions
no data available

Conditions to avoid
Heat, flames and sparks. Extremes of temperature and direct sunlight.

Materials to avoid
Strong acids, Strong oxidizing agents, Acid chlorides, Halogens.

Hazardous decomposition products
Other decomposition products -no data available

11. TOXICOLOGICAL INFORMATION

Acute toxicity
no data available

Skin corrosion/irritation
May irritate skin.

Serious eye damage/eye irritation

May irritate eyes.

Respiratory or skin sensitization
no data available

Germ cell mutagenicity
no data available

Carcinogenicity

IARC:	No component of this product present at levels greater than or equal to 0.1% is identified as a probable, possible or confirmed human carcinogen by IARC.
NTP:	No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA:	No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.
ACGIH	No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

Reproductive toxicity
no data available

Specific target organ toxicity -single exposure (Globally Harmonized System)
May cause respiratory irritation.

Specific target organ toxicity -repeated exposure (Globally Harmonized System)
no data available

Aspiration hazard
no data available

Additional Information
Symptoms of systemic copper poisoning may include: capillary damage, headache, cold sweat, weak pulse, and kidney and liver damage, center nervous system excitation followed by depression, jaundice, convulsions, paralysis, and coma. Death may occur from shock or renal failure. Chronic copper poisoning is typified by hepatic cirrhosis, brain damage and demyelination, kidney defects, and copper deposition in the cornea as exemplified by humans with Wilson's disease. It has also been reported that copper poisoning has lead to hemolytic anemia and accelerates arteriosclerosis. Damage to the lungs, Vomiting, Diarrhoea, Abdominal pain, Blood disorders.

Liver – Irregularities – Based on Human Evidence.

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12. ECOLOGICAL INFORMATION

Toxicity

Toxicity to fish
Mortality LOEC – Oncorhynchus mykiss (rainbow trout) – 0.022 mg/L – 96h

Toxicity to daphnia and other aquatic invertebrates
Mortality NOEC – Daphnia – 0.004 mg/L – 24h

EC50 – Daphnia magna (Water flea) – 0.04 – 0.05 mg/L – 48h

Persistence and degradability
no data available

Bioaccumulative potential
Bioaccumulation Cyprinus carpio (Carp) – 40 d – 200 mg/L
Bioconcentration factor (BCF): 108

Mobility in soil
no data available

PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted.

Other adverse effects
An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Very toxic to aquatic life with long lasting effects.
Avoid release to the environment.

13. DISPOSAL CONSIDERATIONS

Product
Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Burn in a chemical incinerator equipped with an afterburner and scrubber, but exert extra care in igniting as this materials is highly flammable.

Contaminated packaging
Dispose of as unused product

14. TRANSPORT INFORMATION

DOT (US)
UN3089 Class: 4.1 Packing group: II
Proper shipping name: Metal powders, flammable, n.o.s.
Reportable Quantity (RQ):
Marine pollutant: No
Poison Inhalation Hazard: No

IMDG
UN3089 Class: 4.1 Packing group: II EMS-No: F-G, S-G
Proper shipping name: Metal powders, flammable, n.o.s
Marine pollutant: No

IATA
UN3089 Class: 4.1 Packing group: II
Proper shipping name: Metal powders, flammable, n.o.s.

15. REGULATORY INFORMATION

SARA 302 Components
Not required

SARA 313 Components
Copper CAS-No. 7440-50-8

SARA 311/312 Hazards
Fire Hazard, Chronic Health Hazard

Massachusetts Right To Know Components
Copper CAS-No. 7440-50-8

Pennsylvania Right To Know Components
Copper CAS-No. 7440-50-8

New Jersey Right To Know Components

Copper CAS-No. 7440-50-8

California Prop. 65 Components

This product does not contain any chemical known to State of California to cause cancer, birth defects, or any other reproductive harm.

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16. DISCLAIMER

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