

**Material Safety Data Sheet**

**Version No.: 4.0(Rev. date : 2023-06-09)**

**CNT-Copper Composite**

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**1. Product and company identification**

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1.1. Product Name /Synonyms: CNT-Copper Composite

1.2. Recommended use of the product and restrictions on use

Recommended use of the product: Electronic materials, lightweight high-strength materials,

Restrictions on use of the product: None available

1.3. Supplier information:

Company name: BIONIA Co., Ltd.

Address: 8-11 Munpyeongseo-ro, Daedeok-gu, Daejeon 34302, Republic of Korea

Emergency phone number: +82-42-930-8594

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**2. Hazards identification**

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**Hazard Description:**

Xi Irritant

F Highly Flammable

**NFPA Ratings (Scale 0-4):**

Health = 1

Flammability = 2

Reactivity = 1

**Pictogram**



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Signal word    Danger

**Emergency Overview:** Harmful by inhalation, in contact with skin and if swallowed. Irritating to the eyes, respiratory system and skin.

The toxicological properties of this material have not been thoroughly investigated. Use prudent laboratory practices for handling chemical substances of unknown toxicity.

**Potential Health Effects:**

Skin Contact:    Short Term Exposure: Possible Irritant  
                                Long Term Exposure: No information available

Eye Contact:    Short Term Exposure: Possible Irritant  
                                Long Term Exposure: No information available

Ingestion:      Short Term Exposure: Possible Irritant  
                                Long Term Exposure: No information available

Inhalation:     Short Term Exposure: Possible Irritant  
                                Long Term Exposure: No information available

Injection:      Short Term Exposure: Possible Irritant  
                                Long Term Exposure: No information available

**CARCINOGEN/REPRODUCTIVE TOXIN STATUS:**

OSHA: Not Listed

NTP: Not Listed

IARC: Not Listed

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### 3. Composition/information on ingredients

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Active Component: Carbon Nanotube–Copper Composite

**Description: (CAS Number)**

Copper (CAS Number: 7440–50–8); 50~90%

Carbon Nanotube (Graphite CAS Number: 7782–42–5); 10~50%

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### 4. First aid measures

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**Skin Contact:** Remove contaminated clothing. Flush affected area with water and then wash with soap or mild detergent and water. Observe for signs of irritation. If irritation is present, get medical attention.

**Eye Contact:** Wash eyes with large amounts of water or normal saline for at least 15 minutes. Observe for signs of irritation. If irritation is present, get medical attention.

**Ingestion:** Get medical attention.

**Inhalation:** Remove from exposure area to fresh air immediately. Get medical attention immediately.

**Injection:** If accidentally injected, get medical attention.

**Note to Physician:** There is no specific antidote. Treat symptomatically and supportively.

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## 5. Fire-fighting measures

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**Suitable Extinguishing Agents:** CO<sub>2</sub>, extinguishing powder or water spray, Fight larger fires with spray.

**Special hazards caused by the material, its products of combustion or resulting gases:** In case of fire, the following can be released; Toxic metal oxide fume.

**Unsuitable Extinguishing Agents:** Water, Carbon Dioxide, Halogenated Extinguisher

**Protective Equipment:** Wear self-contained respirator. Wear fully protective impervious suit.

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## 6. Accidental release measures

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**Person-related safety precautions:** Wear protective equipment. Keep unprotected persons away. Ensure adequate ventilation. Keep away from ignition sources.

**Measures for environmental protection:** Do not allow material to be released to the environment without proper governmental permits.

**Measures for cleaning/collecting:** Ensure adequate ventilation. Keep away from ignition sources.

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## 7. Handling and storage

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### Handling

**Information for safe handling:** Keep container tightly sealed. Store in cool, dry place in tightly closed containers. Ensure good ventilation at the workplace. Prevent formation of dust.

**Information about protection against explosions and fires:** Keep ignition sources away. Protect against electrostatic charges. Fumes can combine with air to form an explosive mixture.

### Storage

**Requirements to be met by storerooms and receptacles:** Store in a cool location.

**Information about storage in one common storage facility:** Store away from oxidizing agents. Store away from water/moisture. Do not store together with acids.

**Further information about storage conditions:** Keep container tightly sealed. Store in cool, dry conditions in well sealed containers.

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## 8. Exposure controls / personal protection

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**Exposure Controls:** Use in laboratory hood or other ventilated device. Occupational exposure limits for this substance have not been established by OSHA, ACGIH, or NIOSH. Use prudent laboratory practices for handling chemical substances of unknown toxicity.

**General protective and hygienic measures:** The usual precautionary measures for handling chemicals should be followed.

Keep away from foodstuffs, beverages and feed. Remove all soiled and contaminated clothing immediately. Wash hands before breaks and at the end of work. Avoid contact with the eyes. Avoid contact with the skin.

**Eye Protection:** Employees must wear splash-proof or dust-resistant safety goggles to prevent eye contact with this substance.

**Clothing:** Employee must wear appropriate protective clothing (laboratory coat with long sleeves) and equipment to prevent skin contact with this material.

**Gloves:** Employee must wear appropriate protective gloves to prevent contact with this material.

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## 9. Physical and chemical properties

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**Description:** Odorless, Dark Brown powder

**Melting point:** Not determined

**Boiling point:** Not determined

**Vapor pressure:** Not determined

**Vapor density:** Not determined

**Flash point:** Not applicable

**Flammability:** Highly flammable

**Decomposition temperature:** Not determined

**Explosion limits:** Not determined

**Solubility in water:** insoluble

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## 10. Stability and Reactivity

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**Stability:** Stable under normal temperatures and pressure.

**Solubility:** Insoluble in water or organic solvents.

**Decomposition products:** Decomposition will not occur if used and stored according to specifications.

**Polymerization:** Not applicable

**Dangerous reactions:** No dangerous reactions known.

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## 11. Toxicological information

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**Acute toxicity:**

Primary irritant effect

On the skin: Irritant to skin.

On the eye: Irritant effect.

Sensitization: Sensitization possible through skin contact.

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**Subacute to chronic toxicity:** Copper compounds may be irritating to the skin, eyes and respiratory tract. They may cause metal fume fever, hemolysis of the red blood cells and injury to the liver, lungs, kidneys and pancreas. Ingestion may also cause vomiting, gastric pain, dizziness, anemia, cramps, convulsions, shock, coma and death.

**Subacute to chronic toxicity:** The inhalation of graphite has caused pneumoconiosis in exposed workers. The pneumoconiosis found is similar to coal worker's pneumoconiosis.

**Additional toxicological information:** To the best of our knowledge the acute and chronic toxicity of these materials is now fully known.

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## 12. Ecological information

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**Environmental impact rating (0–4):** No data available.

**Degradability:** No data available.

**LOG BIOCONCENTRATION FACTOR (BCF):** No data available.

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## 13. Disposal considerations

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Observed all Federal, State, and Local Regulations.

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## 14. Transport information

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Ship as a non-regulated material. No transportation restrictions apply. The acute toxicity profile does not warrant shipment as a hazardous material (DOT) or a dangerous good (IATA).

### Dot regulations

Hazard class: None

### Land transport ADR/RID (cross-border)

ADR/RID class: None

### Maritime transport IMDG

IMDG class: None

### Air transport ICAO-TI and IATA-DGR

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ICAO/IATA class: None

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## 15. Regulatory information

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EINECS/ELINCS: No

NDSL/DSL: No

TSCA STATUS: No

CERCLA SECTION 103 (40 CFR 302.4): No

SARA SECTION 302 (40 CFR 355.30): No

SARA SECTION 304 (40 CFR 355.40): No

SARA SECTION 313 (40 CFR 372.65): No

OSHA PROCESS SAFETY (29 CFR 1910.119): No

CALIFORNIA PROPOSITION 65: No

SARA ACUTE HAZARD (40 CFR 370.21): No

CHRONIC HAZARD: No

FIRE HAZARD: No

REACTIVITY HAZARD: No

SUDDEN RELEASE HAZARD: No

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## 16. Other information

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16.1. List of references

16.2. Initial creation date: 2011-04-07

16.3. Number of revisions and date of last revision: 4.0 / 2023-06-09

16.4. Further information

The material safety data sheet (MSDS) provided by the Korea Occupational Safety and Health Agency was used as a reference and partially modified.

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