Cadmium Sulfide Nanopowder (CdS)

US Research Nanomaterials, Inc.

Material Safety Data Sheet

acc. to OSHA and ANSI

1 Identification of substance:

- **Trade name:** Cadmium Sulfide, CdS
- **Stock number:** US2816
- **Manufacturer/Supplier:**
  US Research Nanomaterials, Inc.
  3302 Twig Leaf Lane
  Houston, Texas 77084
  www.us-nano.com

2 Composition/Data on components:

- **Chemical characterization:**
  Description: (CAS#)

  Cadmium Sulfide (CAS# 1306-23-6), up to 99.99%
- **Identification number(s):**
- **EINECS Number:** 215-147-8

3 Hazards identification

- **Hazard description:**

  HMIS Rating
  Health hazard: 1
  Chronic Health Hazard: *
  Flammability: 0
  Physical Hazard 0

  NFPA Rating
  Health hazard: 1
  Fire Hazard: 0
  Reactivity Hazard: 0
- **Information pertaining to particular dangers for man and**

environment

Acute Tox.	Acute toxicity
Aquatic Acute	Acute aquatic toxicity
Aquatic Chronic	Chronic aquatic toxicity
Carc.	Carcinogenicity
H302	Harmful if swallowed.
H341	Suspected of causing genetic defects.
H350	May cause cancer.
H361	Suspected of damaging fertility or the unborn child.
H372	Causes damage to organs through prolonged or repeated exposure.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.

4 First aid measures

- **After inhalation**
  Supply fresh air. If required, provide artificial respiration. Keep patient warm.
  Seek immediate medical advice.

- **After skin contact**
  Immediately wash with water and soap and rinse thoroughly.
  Seek immediate medical advice.

- **After eye contact**
  Rinse opened eye for several minutes under running water.
  Then consult a doctor.

- **After swallowing** Seek immediate medical advice.

- **Information for doctor**

- **The following symptoms may occur:**
  The most important known symptoms and effects are described in the labelling (see section 3)

5 Fire fighting measures

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

- **Special hazards arising from the substance or mixture**

Sulphur oxides, Cadmium/cadmium oxides

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

6 Accidental release measures

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

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

- **Measures for cleaning/collecting:**
  Dispose contaminated material as waste according to item 13.
  Ensure adequate ventilation.

- **Additional information:**
  See Section 7 for information on safe handling
  See Section 8 for information on personal protection equipment.
  See Section 13 for disposal information.

7 Handling and storage

- **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 away from heat. Keep away from sources of ignition.

- **Storage**

  Keep container dry. Keep in a cool place.

- **Requirements to be met by storerooms and receptacles:**
  No special requirements.

- **Information about storage in one common storage facility:**
  Do not store together with acids.
  Do not store together with alkalies (caustic solutions).
  Store away from oxidizing agents.

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

8 Exposure controls and personal protection

- **Additional information about design of technical systems:**
  Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.

  Components with limit values that require monitoring at the workplace:

  TWA: 0.01 (ppm) Consult local authorities for acceptable exposure limits.

- **Additional information:** No data

- **Personal protective equipment**

- **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.

- **Breathing equipment:**
  Use suitable respirator when high concentrations are present.

- **Protection of hands:** Impervious gloves

- **Eye protection:** Safety glasses

- **Body protection:** Protective work clothing.

9 Physical and chemical properties:

- **General Information**

- **Form:** Powder
- **Color:** Orange.
- **Odor:** no data available
- **Value/Range Unit Method**
- **Change in condition**
- **Melting point/Melting range:** Melting point/range: 999 °C (1,830 °F)
- **Boiling point/Boiling range:** Not determined
- **Sublimation temperature / start:** Not determined
- **Flash point:** Not applicable
- **Flammability (solid, gaseous)** No data available
- **Ignition temperature:** Not determined
- **Decomposition temperature:** Not determined
- **Danger of explosion:** Not determined
  Explosion limits: Not determined
- **Lower:** Not determined
- **Upper:** Not determined
- **Vapor pressure:** Not determined
- **Density:** 4.82 g/ml at 25 °C (77 °F)
- **Solubility in / Miscibility with**
- **Water:** Not determined

10 Stability and reactivity

- **Thermal decomposition / conditions to be avoided:**
  Decomposition will not occur if used and stored according to specifications.
- **Materials to be avoided:**
  Acids
  Oxidizing agents

- **Hazardous decomposition products**
  Other decomposition products - no data available
  In the event of fire: see section 5

11 Toxicological information

- **Acute toxicity**
  LD50 Oral - rat - 7,080 mg/kg
- LD50 Oral - mouse - 1,166 mg/kg
  Inhalation: no data available
  Dermal: no data available
  no data available

- **Skin corrosion/irritation**
  no data available

- **Serious eye damage/eye irritation**
  no data available

- **Respiratory or skin sensitisation**
  no data available

- **Germ cell mutagenicity**
  May alter genetic material.
  In vitro tests showed mutagenic effects

- **Carcinogenicity**
  This is or contains a component that has been reported to be carcinogenic based on its IARC, OSHA, ACGIH, NTP, or EPA classification. Chronic exposure to cadmium may cause lung and prostate cancer.
  Possible human carcinogen
  IARC: 1 - Group 1: Carcinogenic to humans (Cadmium sulphide)
  NTP: Known to be human carcinogen (Cadmium sulphide)
  Known to be human carcinogenThe reference note has been added by TD based on the
  background information of the NTP. (Cadmium sulphide)
  OSHA: 1910.1027 (Cadmium sulphide)

- **Reproductive toxicity**
  Possible risk of congenital malformation in the fetus.
  Suspected human reproductive toxicant
  Overexposure may cause reproductive disorder(s) based on tests with laboratory animals.

- **Specific target organ toxicity - single exposure**

no data available

- **Specific target organ toxicity - repeated exposure**
  Causes damage to organs through prolonged or repeated exposure.
- **Aspiration hazard**
  no data available

- **Additional Information**
  RTECS: Not available
  Acute inhalation exposure to cadmium fumes may cause "metal fume fever" with flu-like symptoms of weakness, fever, headache, chills, nausea, vomiting, dizziness, sweating, muscular pain, cough and difficulty breathing. Acute pulmonary edema may develop within 24 hours and reaches a maximum by three days. The first chronic effect of exposure to cadmium is generally kidney damage, manifested by excretion of excessive protein in the urine, followed by anemia, teeth discoloration and loss of smell. Cadmium also is believed to cause pulmonary emphysema and bone disease.
  Stomach - Irregularities - Based on Human Evidence
  Stomach - Irregularities - Based on Human Evidence

12 Ecological information:

* **General notes:**
Do not allow material to be released to the environment without proper governmental permits.

13 Disposal considerations

* **Product:**

* **Recommendation**
Consult state, local or national regulations to ensure proper disposal.

* **Uncleaned packagings:**

* **Recommendation:**
Disposal must be made according to official regulations.

14 Transport information

Not a hazardous material for transportation.

* **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:**

* **ICAO/IATA Class:** None

* **Transport/Additional information:**
Not dangerous according to the above specifications.

15 Regulations

* **Product related hazard informations:**

* **Hazard symbols:** Xi Irritant

* **Risk phrases:** 37 Irritating to respiratory system.

* **Safety phrases:**
22 Do not breathe dust.
36 Wear suitable protective clothing.
38 In case of insufficient ventilation, wear suitable respiratory equipment.

* **National regulations**
All components of this product are listed in the U.S. Environmental Protection Agency Toxic Substances Control Act Chemical Substance Inventory.

* **Information about limitation of use:**
For use only by technically qualified individuals.

16 Other information:

* Employers should use this information only as a supplement to other information gathered by them, and should make independent judgement of suitability of this information to ensure proper use and protect the health and safety of employees. This information is furnished without warranty, and any use of the product not in conformance with this Material Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.