

MATERIAL SAFETY DATA SHEET (MSDS)

Product Name: Graphene Oxide

Product Series: Graphox-001

1. Product and Company Identification

Product Name: AD- Graphene Oxide

Synonyms: Graphene oxide, Graphene oxide

CAS NO.: 7782-42-5 (Graphene)

MSDS Issue Date – 1/4/2021

Contacting Information:

Manufacturer/ Supplier: M/s. Techinstro

Our Full Address with contact no.

Company: M/s. Techinstro

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2. Composition/Information on Ingredients

Material: Graphene

CAS registry no: 7782-42-5

Physical appearance: Grey–black

3. Hazards Identification

Potential acute health effects: Slightly hazardous regarding skin contact, eye contact, ingestion, or inhalation.

Potential chronic health effects:

Carcinogenic Effects: not available.

Mutagenic effects: not available.

Teratogenic Effects: not available.

Developmental toxicity: The substance is toxic to the respiratory and cardiovascular systems. Handle with caution and prioritize safety measures. Repeated or prolonged exposure can lead to damage to specific organs.

4. First Aid Measures

Eyes: Check and remove contact lenses, if any. In case of contact, immediately flush your eyes with water for at least 15 minutes. Get medical attention if irritation occurs.

Skin:

1. **Wash** with soap and water.
2. Cover the irritated skin with an emollient.
3. Get medical attention if irritation develops.

Inhalation:

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Severe Inhalation: Not available

Ingestion:

Don't induce vomiting. Call a doctor if large amounts are swallowed. Loosen tight clothing.

Serious Ingestion: Not available.

5. Fire Fighting Measures

In general, graphene oxide is difficult to combust. Routine care should be taken to avoid dust explosion risks caused by high concentrations of dust or finely-suspended airborne particles. However, graphene oxide dust is not usually considered an explosion hazard.

Suitable Extinguishing Media: Water, carbon dioxide, dry chemical powder, or foam as appropriate for surroundings.

Other Combustion Hazards: in the event of combustion or thermal decomposition, this material may release carbon monoxide (CO), carbon dioxide (CO₂), or other toxic gases at temperatures over 300°C. This material may react with potassium, sodium, rubidium, or cesium to create intercalation compounds that may ignite and react explosively with Water.

6. Accidental Release Measures

Spilled or released material should be collected mechanically and disposed of in suitable containers. Use care during cleanup to prevent the creation of concentrations of dust.

Personnel: Cleanup personnel should wear suitable protective equipment to prevent inhalation or skin contact. Cleanup staff should be aware of the risk of slipping due to the low coefficient of friction of the material.

Environmental: Do not discharge into storm or sanitary sewers or groundwater.

7. Handling and Storage

This material is stable at room temperature and presents no significant risk of combustion. This material should be stored in labeled, closed containers and away from ignition or heat sources. Care should be taken to avoid accumulating dust since dust can form an explosive mixture. Graphene oxide is electrically non-conductive. Care should be taken, therefore, to prevent accumulations of graphene oxide dust or powders in places where these accumulations could cause shorting of electrical switches, circuits, or components.

Advice on Safe Handling: Provide good ventilation when handling. Personnel should take measures to avoid breathing dust created when driving and should wear suitable protective clothing to prevent skin and eye contact.

8. Exposure Controls, Personal Protection

Exposure Guidelines

Graphene (CAS no. 7782-42-5) TWA: ACGIH (TLV): 2.0 mg/m³ respirable OSHA (PEL): 15 ml/m³ respirable.

Crystalline Silica (CAS no. 14808-60-7) TWA: ACGIH (TLV): 0.025 mg/m³ respirable OSHA (PEL): 10 mg/m³ respirable.

9. Personal Protective Equipment

Respiratory protection: Protect against inhalation. A respiratory protection program meeting the applicable OSHA requirements should be at the workplace.

Eyes protection: The eyes should be covered by wearing suitable safety eyeglasses, chemical protective goggles, or face protection.

Skin protection: Protect skin by wearing protective gloves. Protect skin contact by wearing proper clothing.

Engineering Controls

Provide adequate workplace ventilation. If dusts are generated through handling, local exhaust ventilation should be employed.

10. Physical and Chemical Properties

Physical state and appearance: Solid

Odor: Odorless.

Taste: Tasteless.

Molecular Weight: 12.01 g/mole

Color: Black

pH (1% soln/water): Not applicable

Boiling Point: Not available.

Melting Point: 3650°C (6602°F)

Critical Temperature: 681°C (1257.8°F)

Specific Gravity: Not available

Vapor Pressure: Not applicable.
Vapor Density: Not available.
Volatility: Not general.
Odor Threshold: Not available.
Water/Oil Dist. Coeff.: Not available.
Ionicity (in Water): Not available.
Dispersion Properties: Not available.
Solubility: Soluble in Water, ethanol DMF et al.

11. Stability & Reactivity

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Excess heat, incompatible materials.

It's important to note that this substance may react vigorously with oxidizing agents, making it highly incompatible.

Corrosivity: Non-corrosive in the presence of glass.

Special Remarks on Reactivity:

Graphene oxide reacts strongly with liquid potassium, potassium peroxide, rubidium, or cesium at 300°C, possibly forming intercalation compounds.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

12. Toxicological Information

Routes of Entry: Inhalation. Ingestion.

Toxicity to Animals:

LD50 (oral, rat): >2000mg/kg (Graphene)

LC50 (inhalation, rat): Not available.

Chronic Effects on Humans:

Causes damage to the below organs: upper respiratory tract. It may cause damage to the following organs as well: The Cardiovascular System.

Toxic Effects on Humans: A bit hazardous in case of skin contact, inhalation or ingestion.

Special Comments on Toxicity to Animals: Not available.

Special Comments on Other Toxic Effects on Humans:

Acute Potential Health Effects:

Skin: Causes skin irritation.

Eyes: Dust causes eye irritation.

Inhalation: This may be harmful if inhaled. Dust causes respiratory tract and mucous membrane irritation. **Ingestion:** May be harmful if swallowed. It may cause gastrointestinal (digestive) tract irritation with nausea and vomiting.

Chronic Potential Health Effects: Inhalation of high concentrations of graphene dust over prolonged periods may cause pneumoconiosis. Symptoms can include cough, shortness of breath, and decreased pulmonary function. Preexisting pulmonary disorders such as emphysema may be aggravated by long-term exposure to high concentrations of graphene dust. The toxicology of this substance has yet to be thoroughly investigated.

13. Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:

Hazardous short-term degradation products are not likely. However, prolonged degradation products may arise.

Toxicity information of the Biodegradation Products: The self-product and its degradation products are not toxic.

Special Comments on the Products of Biodegradation: Not available.

14. Disposal Considerations

Waste Disposal:

Waste must be disposed of by federal, state, and local environmental control regulation.

Transport Information

DOT Classification: Not a DOT-controlled material (United States).

Identification: Not applicable

Special Provisions for Transport: Not applicable.

15. Regulatory Information

Graphene oxide (Graphene, CAS no. 7782-42-5) is not listed as a hazardous material under US Federal regulations. It is not listed under the Clean Air Act, the Clean Water Act, SARA (section 302, section 311/312, or section 313), HAPS, or IARC.

Graphene (CAS no. 7782-42-5) is listed on:

US: TCSA Canada: DSL EC: EINECS

This product has WHMIS (Canada) classification D2A

US: TCSA Canada: DSL EC: EINECS
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16. Other Information

References: Not available.

Other Special Considerations: Not available.

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