



Qingdao Meizhen Graphite Co.,Ltd

Northeastern Side Zhangjiatuan Village Liyuan Street Office Pingdu City Qingdao

Material Safety Data Sheet (MSDS)

Section 1 – Identification of the Substance / Preparation, and of the Company

1.1: Product Identification

Trade Name: Spherical Graphite

Registration Number: /

Substance Name: Graphite, CAS 7782-42-5 EC Number: 231-955-3

1.2: Identified uses of the substance or mixtures

Uses: Anode material for Li-ion batteries.

Uses Advised Against: For industrial use only. Not recommended as food or cosmetic additive.

1.3: Supplier Information

Company/Manufacturer:

QINGDAO Meizhen Graphite CO.,LTD

Northeastern side zhangjiatuan village Liyuan street office pingdu city qingdao

1.4: Emergency Telephone Number 86-0532-87328778

Section 2: Hazards Identification

2.1: Classification of substance Spherical Graphite is not a hazardous substance

2.2: Label Elements Spherical Graphite is not a hazardous substance, no label elements are required 2.3: Other hazards: None known



Section 3 – Composition/Information on Ingredients:

Chemical Composition: Carbon variety Graphite 95-99.99% (balance is inert ash) CAS # 7782-42-5 EC # 231-955-3

Molecular Weight: 12.0

Section 4 – First Aid Measures

4.1.1 Inhalation Remove patient to particulate-free environment. Wear approved dust mask to avoid breathing dust. Seek medical attention if irritation persists.

4.1.2 Skin Wash with mild soap and warm water: Graphite is non-staining to skin and is not a

chemical Contact irritant.

4.1.3 Eye Rinse with tepid water until eyes are clear of particulates. Seek medical attention if irritation Contact persists.

4.1.4 Ingestion Get immediate medical attention. Do not induce vomiting unless directed by medical personnel. Spherical graphite is not known to be toxic by ingestion. However, ingestion may cause digestive system blockage.



Qingdao Meizhen Graphite Co.,Ltd

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4.2 Most important symptoms and effects, both acute and delayed: No Data Available

4.3 Indication of any immediate medical attention and special treatment needed: If patient exhibits shortness of breath, choking, powder inundated eyes or mouth, immediate medical attention may be required.

Section 5 – Fire Fighting Measures

Graphite is not flammable under normal conditions

5.1 Extinguishing Media Dry chemical extinguisher, water, sand, limestone powder,

5.2 Special Hazards At temperatures above 1500 C, graphite reacts with substances containing oxygen, including water and carbon dioxide. In case of intensely hot fire events, use sand to cover and isolate graphite. Products of Combustion: Carbon dioxide, CO₂, carbon monoxide, CO.

5.3 Advice for Fire Fighters: Use self contained air pack, gloves, safety goggles 5.4 Additional Information: USA NFP Rating 110

Section 6 – Accidental Release Measures

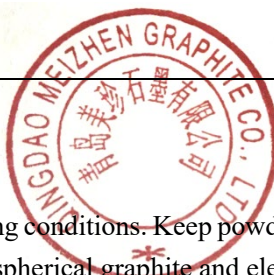
| | |
|--|--|
| | Wear approved dust mask, safety goggles, and conventional work gloves. |
| Methods for Cleaning Up: | Conventional Sweep or vacuum. Avoid creating dusting conditions |
| 6.1 Personal precautions , protective equipment and emergency procedures | |
| 6.1.1 For non-emergency personnel: | Wear approved dust mask, safety goggles, and conventional work gloves. Use conventional cleanup techniques and avoid creating dust. Vacuum is preferred over sweeping. Be cautious of slip hazard on wet or dry pedestrian surfaces. Wear a dust mask/respirator to reduce the change of inhaled dust. Graphite is electrically conductive and any cleanup methods should avoid contacting graphite with electrical circuitry. |
| 6.1.2 For emergency responders: | Wear approved dust mask, safety goggles, and conventional work gloves. Same methodology as for non-emergency personnel(sec 6.1.1) |
| 6.2 Environmental Precautions: | Spherical graphite is inert and insoluble and will not pose any soluble ion hazards to the environment. However, good housekeeping practices should be followed and spilled material should be cleaned up, and disposed of in an appropriate manner. |
| 6.3 Methods and material for containment and clean up: | No special containment needed other than conventional vacuuming and waste containment. Avoid creating dust. Graphite is electrically conductive and any cleanup methods should avoid contacting graphite with electrical circuitry |
| 6.4 Reference to other sections: | Not needed |
| 6.5 Additional information: | Not needed |

Section 7 – Handling and Storage

7.1 Precautions for safe handling

7.1.1 Handling Use conventional methods, but avoid dusting conditions. Keep powder from contacting eyes. Spherical graphite is a good conductor of electricity. Avoid contact between spherical graphite and electrical circuitry. Slip Hazard: Graphite is a highly lubricious material and may present a slip hazard if spilled on wet or dry pedestrian surfaces.

7.2 Conditions for safe storage, including any incompatibilities. Storage and Incompatibilities Store all carbonaceous materials in a dry location. Graphite is incompatible with all oxidizing agents Dust Explosibility Hazards: Very finely divided graphite





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powder poses a very slight risk of dust explosion hazard: Dust class ST1, MIE greater than 10 J (very low hazard of spark ignition)

Section 8 – Exposure Controls/ Personal Protection

8.1 Control parameters

| 8.1.1 Occupational exposure limits | | | | |
|--|-----------|-----|--|---|
| Component | CAS No | % | ACGIH TWA | Control Reference |
| Graphite | 7782-42-5 | 100 | 2.0 mg/m ³ Respirable dust | 2014 ACGIH TLV Handbook |
| Graphite | 7782-42-5 | 100 | 10.0 mg/m ³ Inhalable dust | 2014 ACGIH TLV Handbook (insoluble particles not otherwise specified) |
| Engineering Measures Use adequate dust collection to maintain dust levels below the control or recommended values. | | | | |
| Respiratory Protection Approved dust mask, type N95 recommended. | | | | |
| Eye Protection Conventional safety glasses or goggles. | | | | |
| Skin Protection Conventional work gloves and clothing. | | | | |
| Additional Graphite spilled on pedestrian surfaces may pose a significant slip hazard. | | | | |
| 8.2 Exposure controls | | | | |
| 8.2.1 Appropriate engineering controls: Use adequate dust collection to maintain dust levels below the control or recommended values. | | | | |
| 8.2.2 Personal protective equipment 8.2.2.1 Eye/Face Protection: Wear laboratory goggles, or full side shielded safety glasses. | | | | |
| 8.2.2.2 Skin Protection: Conventional work gloves and clothing. | | | | |
| 8.2.2.3 Respiratory Protection: Approved dust mask, type N95 recommended. | | | | |
| 8.2.3 Environmental exposure controls: Spherical graphite is inert and insoluble. To the best of our knowledge, Spherical graphite should not present any environmental hazards. No special environmental exposure controls, other than standard practices for dust and spill control, are required. | | | | |



Section 9 – Physical and Chemical Properties

9.1 Information on basic physical and chemical properties

| | | | |
|------------------|---------------|----------------|---------------------------|
| Color: | Gray to Black | Material State | Solid, granular or powder |
| Odor | None | | |
| Boiling Point: | NA | Melting Point | Sublimates at 3652C |
| Specific Gravity | 2.26 | Vapor Density | Not applicable |



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Northeastern Side Zhangjiatuan Village Liyuan Street Office Pingdu City Qingdao

| | | | |
|------------------------|--|----------------------|--|
| Vapor Pressure (mm Hg) | NA | % Volatile (By Wt.) | 0-1% |
| Solubility in Water | Insoluble | Evaporation Rate: | Not applicable |
| pH | NA | Auto Ignition | Above 500 °C |
| Decomposition Temp | Oxidizes above 450C | Dust Explosion class | ST1=KST>0-200 bar m/s, MIE above 10 J. |
| Flash Point | NA Solid substance with very high melting point. | | |

Section 10 – Stability and Reactivity

| | | | |
|--|--|--|--|
| 10.1 Reactivity | Graphite is non-reactive under ambient conditions. | | |
| 10.2 Stability | Stable. Will not polymerize or self react spontaneously. | | |
| 10.3 Possibility of hazardous reactions | | | |
| 10.4 Conditions to Avoid | Avoid contact with oxidizing agents. Graphite will begin to oxidize at temperatures above 450 C. | | |
| 10.5 Incompatible materials | Oxidizing agents | | |
| 10.6 Hazardous products of decomposition | Carbon Dioxide (CO ₂), Carbon Monoxide (CO) | | |
| Flammable Limits (% by Vol.) | LEL and UEL values not available: Minimum Ignition Energy (MIE) greater than 10 joules. When exposed to extremely high energy ignition sources very finely divided graphite powder can form explosive mixtures with air. Avoid contact between graphite ds and high energy ignition sources. Classified as combustible but not | | |

Section 11 – Toxicological Information

11.1 Information on toxicological effects

Acute toxicity

| | Effect dose | Species | Method | Remarks |
|---------------------------|----------------------|---------|----------|-------------------------|
| Acute oral toxicity | LD50 > 2000 mg/kg bw | Rat | OECD 423 | |
| Acute inhalation toxicity | LC50 > 2000 mg/m3 | Rat | OECD 403 | Limit dose acc. to CLP. |

| | Species | Method | Result | Remarks |
|-----------------------------------|----------|----------|-----------------------|-----------------------------------|
| Skin corrosion/irritation | Rabbit | OECD 404 | Not irritating | |
| Serious eye damage/irritation | Rabbit | OECD 405 | Not irritating | |
| Respiratory or skin sensitization | Mouse | OECD 429 | Not sensitizing | |
| | Species | Method | Result of effect dose | Remarks |
| Genotoxicity | In vitro | OECD 471 | Negative | Bacterial reverse mutation assay. |



Qingdao Meizhen Graphite Co.,Ltd

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|-----------------------|----------|------------|-------------------------------|---|
| Genotoxicity | In vitro | OECD 473 | Negative | Mammalian chromosome aberration test. |
| Genotoxicity | In vitro | OECD476 | Negative | Mammalian cell gene mutation test (gene mutation). |
| Carcinogenicity | | Literature | Not carcinogenic (DFG, 2002). | Based on available data the classification criteria are not met. |
| Reproductive toxicity | Rat | OECD 422 | NOAEL > 1000 mg/kg bw | Dose as nominal food intake, corresponding to limit dose according to OECD 422. Based on available data the classification criteria are not met |

STOT-single exposure

| Single exposure | Specific effect | Affected organs | Remark |
|---|---|-----------------|--|
| Acute oral toxicity OECD 423 (rat) | No specific effects. | Not applicable | Based on available data the classification criteria are not met. |
| Acute inhalation toxicity OECD 403 (rat) | Only usual signs of discomfort after the end of exposure were observed. | Not applicable | Based on available data the classification criteria are not met. |

STOT-repeated exposure

| Repeated exposure | Specific effects | Affected organs | Remark |
|--|--|--------------------|--|
| Sub-acute oral OECD 422 (rat) | No specific effects | Not applicable. | Based on available data the classification criteria are not met. |
| Sub-acute inhalation OECD 412 (rat) | Wet lung weight was increased. Minor histopathological findings in lung and nasal cavity | Respiratory tract. | Based on available data the classification criteria are not met. |

Aspiration hazard: Solid substance. Based on available data the classification criteria are not met.

11.1 Information on toxicological effects: continued

Symptoms related to the physical, chemical and toxicological characteristics

In case of ingestion: No signs of systemic toxicity found in studies acc. to OECD 423 and OECD 422. No human data on effects after ingestion. See section 4 for first aid measures.

In case of skin contact: No irritation or corrosion found in a study acc. to OECD 404. No human data on effects after skin



Qingdao Meizhen Graphite Co.,Ltd

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contact. See section 4 for first aid measures.

In case of inhalation: No signs of systemic toxicity found in studies acc. to OECD 403 and OECD 412.

Usual signs after inhalation of poorly soluble dusts with low toxicity were found in these studies. No symptoms are expected if relevant occupational exposure levels and derived no effect levels are complied with. In situations of repeated excessive lung overload due to a high airborne concentration of particles of respirable size for extended periods of time pneumoconiosis may develop. See section 4 for first aid measures.

In case of eye contact: No irritation or corrosion found in a study acc. to OECD 405. No human data on effects after eye contact. See section 4 for first aid measures.

11.2 Experiences made in practice

Observations relevant to classification: None.

Other observations: None.



11.3 Other information

Neither signs for systemic toxicity nor for local skin-/eye-irritation nor sensitizing properties were found in any of the available studies. Repeated dose inhalation studies revealed some local effects generally observed after inhalation of poorly soluble dusts with low toxicity.

Section 12 – Ecological Information

| | |
|----------------|---|
| 12.1 Toxicity: | Spherical graphite is inert and insoluble. To the best of our knowledge, spherical graphite does not present any significant environmental hazards. |
|----------------|---|

12.1.1 Aquatic Toxicity: Graphite is not water soluble and does not present a soluble-ion hazard. Fine graphite particles suspended in natural water bodies may be harmful to organisms sensitive to suspended solids.

| Aquatic toxicity | Effect dose | Exposure time | Method | Remarks |
|------------------------|-----------------|---------------|--------------------------|---|
| Acute fish toxicity | LC50 > 100 mg/l | 96 hour | OECD 203 (EU method C.1) | No adverse reaction up to the tested concentration could be observed. |
| Acute daphnia toxicity | EC50 > 100 mg/l | 48 hour | OECD 202 (EU method C.2) | No adverse reaction up to the tested concentration could be observed. |
| Acute algae toxicity | EC50 > 100 mg/l | 72 hour | OECD 201 (EU method C.3) | No adverse reaction up to the tested concentration could be observed. |

12.1.2 Sediment toxicity: None known.



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12.1.3 Terrestrial toxicity: None known.

12.2 Persistence and degradability: Graphite is a reduced form of carbon and will not degrade further under normal conditions. This form of carbon is stable, unreactive in water under ambient conditions, and is insoluble.

12.3 Bioaccumulation potential: There is no evidence indicating that graphite is bioaccumulative.

12.4 Soil Mobility: Graphite is not expected to have mobility in soil as it is an insoluble, inorganic substance.

12.5 PBT and vPvB assessment: Graphite is not a persistent bioaccumulative and toxic substance.

12.6 Other adverse effects: None known. Graphite has no ozone depleting potential.

Section 13 – Disposal Considerations

Dispose of in a manner which conforms to local, state and Federal regulations.

Graphite is a reduced form of carbon. Graphite is non-hazardous but disposal of graphite waste should be handled in a responsible matter.

Graphite is a form of elemental carbon so it is not biodegradable.

Provision of a European Waste Catalog, waste code number, should be handled in agreement with the regional waste disposal company.

Packaging should be completely emptied of contents and disposed of in a manner specified by the recycler/regional disposal contractor. Dust formation from packaging residues should be avoided. Store empty packaging in a suitable receptacle

Section 14 – Transport Information

| | |
|------------------------------|--|
| 14.1 UN Number | Not applicable |
| 14.2 UN Proper shipping name | Not applicable |
| 14.3 Transport hazard class | Not applicable |
| 14. 4 Packing Group | Not applicable |
| 14.5 Environmental hazards | None known |
| Marine Transport | Not classified as a hazardous material |
| Land Transport | Not classified as a hazardous material |
| Air Transport | Not classified as a hazardous material |
| Transport Label Required | No label required |
| | |

Section 15 – Regulatory Information

15.1 Regulatory Status and Inventories



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| | |
|------------------------|------------|
| Not Classified | |
| Inventory Information: | |
| EEC EINECS | #231-955-3 |
| US TSCA | Yes |
| Canada DSL | Yes |
| Canada NDSL | No |
| Australian AICS | Yes |
| Korean ECL | Yes |
| Asia PAC | Yes |
| Swiss Giftliste 1 | Yes #G8422 |
| IECSC | Yes |
| PICCS | Yes |
| New Zealand NZLoC | Yes |

REACH: Spherical graphite is exempt from REACH registration per Annex V, Paragraph VII.

RoHS: Spherical graphite is compliant with the EU RoHS directive

WEEE: Spherical graphite is compliant with the EU waste electrical and electronic equipment directive

15.2 Chemical Safety Assessment: For this substance a chemical safety assessment is not required

Section 16 – Other Information

Abbreviations Used:

ACGIH TWA American Council of Government and Industrial Hygienists Time Weighted Average value. CAS Chemical Abstracts Service

NA Not applicable

N.O.S. Not otherwise specified

BW Body weight