

SAFETY DATA SHEET

Product:	Graphene-LCO Non-flammable Lithium-Ion Battery
Distributor/ supplier/ manufacturer:	Nanotech Energy, Inc. 323 Sunny Isles Blvd, 7th Floor Sunny Isles Beach, FL 33160
Phone number:	1 (800) 995-5491
Relevant identified uses of the substance or mixture Further Information	Lithium-ion batteries. Use for recommended use only Battery system: Lithium-ion (Li-ion) Nominal Voltage: 3.7 V Rated Capacity: 2.00 Ah Wh rating: 7.4 Wh Anode (Negative electrode): based on intercalation graphite Cathode (positive electrode): based on lithiated metal oxide (cobalt)

Hazards Identification

Hazard Statement:	GHS Classification in accordance with 29 CFR 1910 (OSHA HCS) Not classified
Classification of the substance or mixture	<p>Preparation Hazards and Classification: The product is a Lithium-ion cell or battery and is therefore classified as an article and is not hazardous when used according to the recommendations of the manufacturer. The hazard is associated with the contents of the cell or battery. Under recommended use conditions, the electrode materials and liquid electrolyte are non-reactive provided that the cell or battery integrity remains, and the seals remain intact. The potential for exposure should not exist unless the cell or battery leaks, is exposed to high temperatures or is mechanically, electrically, or physically abused/damaged. If the cell or battery is compromised and starts to leak, based upon the battery ingredients, the contents are classified as Hazardous.</p> <p>Hazardous Materials Information Label (HMIS) Health: Not available Flammability: Not available Physical Hazard: Not available</p> <p>NFPA Hazard Ratings Health: Not available Flammability: Not available Reactivity: Not available</p>

<p>Label Elements</p>	<p>Hazard pictograms: Not applicable Signal word: Not applicable Hazard statement: Not applicable Precautionary statements: Not applicable Supplemental Hazard information (EU): Not applicable</p>
<p>Other hazards:</p>	<p>Appearance, Color and Odor: Solid object with no odor.</p> <p>Primary Routes(s) of Exposure: These chemicals are contained in a sealed enclosure. Risk of exposure occurs only if the cell or pack is mechanically, thermally, electrically, or physically abused to the point of compromising the enclosure. If this occurs, exposure to the electrolyte solution contained within can occur by inhalation, ingestion, eye contact and skin contact.</p> <p>Potential Health Effect(s):</p> <p>Acute (short term): see Section 8 for exposure controls. If this cell or pack has been ruptured, the electrolyte solution contained within the cell would be corrosive and can cause burns to skin and eyes.</p> <p>Inhalation: Inhalation of materials from a sealed cell is not an expected route of exposure. Vapors or mists from a ruptured cell may cause respiratory irritation.</p> <p>Ingestion: Swallowing of materials from a sealed cell is not an expected route of exposure. Swallowing the contents of an open cell can cause serious chemical burns to mouth, esophagus, and gastrointestinal tract.</p> <p>Skin: Contact between the cell and skin will not cause any harm. Skin contact with the contents of an open cell can cause severe irritation or burns to the skin.</p> <p>Eye: Contact between the cell and the eye will not cause any harm. Eye contact with the contents of an open cell can cause severe irritation or burns to the eye.</p> <p>CHRONIC (long term): see Section 11 for additional toxicological data.</p> <p>Interactions with other chemicals: Immersion in high conductivity liquids may cause corrosion and breaching of the cell or battery enclosure. The electrolyte solution inside of the cells may react with alkaline (basic) materials and present a flammability hazard.</p> <p>Potential Environmental Effects: Not Available.</p>

Composition / Information on Ingredients

CAS No.	Name	Classification according to Regulation (EC) No 1278/2008(CLP)
7782-42-5	- Graphite	- Not classified
7440-50-8	- copper	- Not classified
7429-90-5	- aluminum	- Pyr. Sol. 1, H250 - Water-react. 2, H261
7440-44-0	- carbon	- Not classified
1308-06-1	- tricobalt tetreoxide	- Not classified
12016-80-7	- Carbon hydroxide	- Not classified
554-13-2	- Lithium carbonate	- Not classified

First Aid Measures

First Aid:	<p>General advice: Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area. Administer oxygen if breathing is difficult. Keep victim warm and quiet.</p> <p>In case of eye contact Flush with plenty of water for at least 15 minutes and consult a physician immediately. Remove contact lenses.</p> <p>In case of skin contact Remove contaminated clothing and wash before reuse. Immediately rinse contact area with plenty of clean water. Provide first aid to contacted area to prevent infection. Get medical attention.</p> <p>If inhaled If inhaled, move person into fresh air. If breathing is difficult, admin oxygen. If not breathing, give artificial respiration. Consult a physician.</p> <p>If swallowed DO NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician/ Poison control</p> <p>Most important symptoms and effects, both acute and delayed</p> <p>Acute effects: Not available</p> <p>Delayed effects: Not available</p> <p>Indication of immediate medical attention and special treatment needed - Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.</p>
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Firefighting Measures

Suitable Extinguishing Media	Carbon dioxide gas, nitrogen gas, chemical powder fire extinguishing medium and fire foam.
Specific Hazards	Corrosive gas may be emitted during fire
Specific methods of firefighting	When the battery burns with other combustibles simultaneously, take fire extinguishing methods which correspond to combustibles. Extinguish a fire from the windward as much as possible.

Accidental Release Measure

1	<p>Personal precautions, protective equipment, and emergency procedures For non-emergency personnel Protective equipment: Use personal protective equipment, see Section 8 Emergency procedures:</p> <ul style="list-style-type: none"> - In case of cell damage, possible release of dangerous substances and a flammable gas mixture. - Eliminate all ignition sources. - Please note that materials and conditions to avoid. - Battery may emit electrolyte if charging or discharging rates exceed manufacturer's recommendations or if pack has been breached. - Move battery to well ventilated area to prevent gas accumulation. <p>For emergency responders</p> <ul style="list-style-type: none"> - Eliminate all ignition sources. - Please note that materials and conditions to avoid. - Move battery to well ventilated area to prevent gas accumulation.
2	<p>Environmental precautions</p> <ul style="list-style-type: none"> - Avoid release to the environment. - Prevent entry into waterways, sewers, basements, or confined areas.
3	<p>Methods and materials for containment and cleaning up For containment: Not available For cleaning up: Cover with Dry earth, DRY sand or other non-combustible material and put on the plastic sheet to minimize spreading or contact with rain.</p> <ul style="list-style-type: none"> - Move battery to well ventilated area to prevent gas accumulation. - Dispose in accordance with applicable local, state, and federal regulations. <p>Other information: Not available.</p>

Handling and Storage

1	<p>Precautions for safe handling</p> <ul style="list-style-type: none"> - In case of cell damage, possible release of dangerous substances and a flammable gas mixture. - The battery stores electrical energy and is capable of rapid energy discharge. - Battery cell contents are under pressure. - Handle battery carefully to avoid puncturing case or electrically shorting terminals.
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2	<p>Conditions for safe storage, including any incompatibilities Technical measures and storage conditions: Not available Packaging materials: Not available Requirements for storage rooms and vessels: - Storage at room temperature (approx. 20°C) at approx. 40% of the nominal capacity - Keep in closed original container.</p>
3	<p>Specific end use(s) Recommendations: Not available Industrial sector specific solutions: Not available</p>

Exposure Controls/ Personal Protection Control

Name	ACGIH regulation	Biological exposure index	OSHA regulation	NIOSH Regulation	EU Regulation
Graphite	TWA= 2mg/m ³	Not available	N/A	N/A	N/A
Copper	TWA= 0/2 mg/m ³ (fume)	Not available	N/A	N/A	N/A
Aluminum	TWA= 1mg/m ³ (respirable particulate matter)	Not available	TWA= 15 mg/m ³ (aluminum metal (as Al) total dust) TWA= 5 mg/m ³ (aluminum (metal as Al) Respirable fraction)	TWA= 1 mg/m ³ (Aluminum metal (as Al), Respirable fraction)	N/A
Carbon	TWA= 3 mg/m ³ (inhalable particulate matter)	Not available	TWA= 3.5 mg/m ³	TWA= 3.5 mg/m ³ Ca TWA= 0.1 mg PAHs/m ³ [Carbon black in presence of polycyclic aromatic hydrocarbons (PAHs)]	N/A
Tricobalt tetraoxide	N/A	Not available	N/A	N/A	N/A
Lithium Carbonate	N/A	Not available	N/A	N/A	N/A

Control Parameters	<p>Components with workplace control parameters None</p>
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Exposure Control	<p>Substance/mixture related measures to prevent exposure during identified uses:</p> <ul style="list-style-type: none"> - Avoid charging batteries in areas where hydrogen gas accumulates. - Use local exhaust ventilation to maintain concentrations of hydrogen below the Lower Explosive collect and transport flammable gases in ventilation systems. - Ensure proper ventilation is present and electrolyte mist and vapors. <p>Structural measures to prevent exposure:</p> <ul style="list-style-type: none"> - Avoid charging batteries in areas where hydrogen gas accumulates. - Use local exhaust ventilation to maintain concentrations of hydrogen below the Lower Explosive collect and transport flammable gases in ventilation systems. - Ensure proper ventilation is present and electrolyte mist and vapors. <p>Organizational measures to prevent exposure: Not available</p> <p>Technical measures to prevent exposure:</p> <ul style="list-style-type: none"> - Ensure proper ventilation is present and electrolyte mist and vapors.
Personal Protective equipment	<p>Eye/face protection</p> <ul style="list-style-type: none"> - Wear ANSI approved safety glasses with side shield during normal use. - Wear NIOSH approved face shield with safety glasses and H.V protection during intentional disassembly. <p>Skin protection</p> <p>Hand protection</p> <ul style="list-style-type: none"> - Wear nitrile butyl rubber, neoprene, or PVC glove during battery component disassembly. - Discard contaminated work clothing after one workday. <p>Other skin protection</p> <ul style="list-style-type: none"> - Wear protective clothing during battery component disassembly. - Discard contaminated work clothing after one workday. <p>Respiratory protection:</p> <ul style="list-style-type: none"> - None required during normal use. - Wear NIOSH or European Standard EN 149 approved full or half face piece (with goggles) respiratory protective equipment when necessary. - In lack of oxygen (< 19.5%), wear the supplied-air respirator or self-contained oxygen breathing apparatus. - In case exposed to particulate material, the respiratory protective equipment as follow is recommended; facepiece filtering respirator or air-purifying respirator, high-efficiency particulate air (HEPA) filter media or respirator equipped with powered fan, filter media of use (dust, mist, fume)
Environmental exposure control	<p>Substance/mixture related measures to prevent exposure: Not available</p> <p>Instruction measures to prevent exposure: Not available</p> <p>Organizational measures to prevent exposure: Not available</p> <p>Technical measures to prevent exposure: Not available</p>

Physical and Chemical Properties

Appearance	Form: Solid
Odor	Not determined
Odor Threshold	Not determined
pH	Not determined
Melting point/ freezing point	Not determined
Initial boiling point and boiling range	Not determined
Flash Point	Not determined
Evaporation rate	Not determined
Flammability (solid, gas)	Not determined
Upper/lower flammability or explosive limits	Upper explosion limit: Not determined Lower explosion limit: Not determined
Vapor pressure	Not determined
Vapor density	Not determined
Relative density	Not determined
Water solubility	Not determined
Partition Coefficient	Low Pow: Not determined
Auto-ignition temperature	Not determined
Decomposition temperature	Not determined
Viscosity	Not determined
Explosive properties	Not determined
Oxidizing properties	Not determined

Stability and Reactivity

Reactivity	Stable in ambient temperature
Chemical stability	<ul style="list-style-type: none"> - There is no hazard when the measures for handling and storage are followed. - Stable under normal temperatures and pressures.
Possibility of hazardous reactions	<ul style="list-style-type: none"> - Will not occur under normal conditions. - In case of cell damage, possible release of dangerous substances and a flammable gas mixture. - Containers may explode when heated. - Fire may produce irritating and/or toxic gases. - Some liquids produce vapors that may cause dizziness or suffocation. - Inhalation of material may be harmful.
Conditions to avoid	<ul style="list-style-type: none"> - Keep away from heat/sparks/open flames/hot surfaces. No smoking. - Friction, heat, sparks, or flames - Dusts or shavings from borings, turnings, cuttings, etc. - Do not exceed manufacturer's recommendation for charging or use battery for an application for which it was not specifically designed. - Do not electrically short.

Incompatible material	<ul style="list-style-type: none"> - Avoid contact with acids and oxidizers. - Keep away from any possible contact with water, because of violent reaction and possible flash fire. - Handle under inert gas. Protect from moisture. - Combustibles, reducing agents
Hazardous decomposition products	<ul style="list-style-type: none"> - None under normal conditions. - Corrosive and/or toxic fume - Material may produce irritating and highly toxic gases from decomposition by heat and combustion during burning. - Irritating and/or toxic gases

Toxicological information

Information on toxicological effects:	<p>Acute toxicity Not determined</p> <p>Skin corrosion/ irritation Not determined</p> <p>Serious eye damage/ eye irritation Not determined</p> <p>Respiratory or skin sensitization Not determined</p> <p>Germ cell mutagenicity Not determined</p> <p>Carcinogenicity Not determined</p> <p>Reproductive toxicity Not determined.</p> <p>Specific target organ toxicity- single exposure Not determined</p> <p>Specific target organ toxicity- repeated exposure Not determined</p> <p>Aspiration hazard Not determined</p> <p>Additional information None</p>
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Ecological Information

Toxicity Toxicity to Fish	Not determined
Toxicity to daphnia and other aquatic invertebrates Toxicity to bacteria	
Persistence and degradability	Not determined
Bio accumulative potential	Not determined
Mobility in soil	Not determined
Results of PBT and vPvB assessment	Not determined
Other adverse effect	Not determined

Disposal Considerations

Waste from residues / unused products:	Consider the required attentions in accordance with waste treatment management regulation.
Waste treatment-relevant information	Waste must be disposed of in accordance with federal, state, and local environmental control regulations.

Transport Information

UN number	3480
Shipping name	Lithium-ion batteries
Transport hazard class	9
Packing group	II
Special provisions	188,230,384
Packing instructions	P903
Environmental hazards	No
Special precautions for user	In case of fire: F-A In case of leakage: S-I
Package labels	

Regulatory Information

Authorization and / or restrictions on use	None
EPCRA 302 Regulation	None
EPCRA 304 Regulation	None
EPCRA 313 Regulation	<ul style="list-style-type: none"> - Cobalt, Co: Regulated - lithium carbonate - Aluminum (metal): Regulated - Copper: Regulated - 1-Methyl-2-pyrrolidinone: Regulated - Chromium: Regulated

Other Information

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product regarding appropriate safety precautions. It does not represent any guarantee of the properties of the production. Nanotech Energy shall not be held liable for any damage resulting from handling or from contact with the above product.