

SAFETY DATA SHEET

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

Product identifier

Product Name Lithium ion polymer cell 606090

Other means of identification

Synonyms None

Recommended use of the chemical and restrictions on use

Recommended Use LITHIUM ION BATTERIES

Uses advised against No information available

Details of the supplier of the safety data sheet

Supplier Name Firstar Battery Co., Limited
Supplier Address Building 2, Fuzhong Industrial Park, Fuyong Town, Shenzhen, Guangdong, 518103 China
Supplier Phone Number Phone: +860755-33919852
 Fax: +860755-33919852
 Contact Phone +860755-33919852
Supplier Email zjj@better-id.com
Emergency telephone number

2. HAZARDS IDENTIFICATION


Classification

This chemical is not considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200) This product is an article which is a sealed battery and as such does not require an MSDS per the OSHA hazard communication standard unless ruptured. The hazards indicated are for a ruptured battery.

| | |
|--|-------------|
| Skin corrosion/irritation | Category 2 |
| Serious eye damage/eye irritation | Category 2 |
| Carcinogenicity | Category 1A |
| Specific target organ toxicity (repeated exposure) | Category 1 |
| Acute toxicity(Oral) | Category 4 |
| Acute Inhalation(Gases) | Category 4 |
| Acute Inhalation(Dusts/Mists) | Category 4 |

GHS Label elements, including precautionary statements

Emergency Overview

| | | | |
|--|--|-----------------------|----------------------|
| Signal word | Danger | | |
| Hazard Statements | Cause skin irritation Harmful in contact with skin Harmful if swallowed Harmful inhaled Causes serious eye irritation May cause an allergic skin reaction May cause cancer | | |
|  | | | |
| This product is an article which contains a chemical substance. Safety information is given for exposure to the article as sold. Intended use of the product should not result in exposure to the chemical substance. This is a battery. In case of rupture: the above hazards exist. | | | |
| Appearance | Silver | Physical State | Solid |
| | | | Odor Odorless |

Precautionary Statements - Prevention

- Obtain special instructions before use
- Do not handle until all safety precautions have been read and understood
- Use personal protective equipment as required
- Wash face, hands and any exposed skin thoroughly after handling
- Do not eat, drink or smoke when using this product
- Wear protective gloves
- Do not breathe dust/fume/gas/mist/vapors/spray
- Wear eye/face protection

Precautionary Statements - Response

- IF exposed or concerned: Get medical advice/attention
- Specific treatment (see supplemental first aid instructions on this label)

Eyes

- IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
- If eye irritation persists: Get medical advice/attention

Skin

- IF ON SKIN: Wash with plenty of soap and water
- Take off contaminated clothing and wash before reuse
- If skin irritation or rash occurs: Get medical advice/attention

Precautionary Statements - Storage

- Store locked up

Precautionary Statements - Disposal

- Dispose of contents/container to an approved waste disposal plant

Hazards not otherwise classified (HNOC)

- Not applicable

Unknown Toxicity

Other information

- Very toxic to aquatic life with long lasting effects

Interactions with Other Chemicals

No information available

3. COMPOSITION/INFORMATION ON INGREDIENTS

| Chemical Name | CAS No. | Weight % |
|---------------------------------------|-------------|----------|
| Cobalt lithium manganese nickel oxide | 182442-95-1 | 32.5 |
| Charcoal, coconut shell | 68647-86-9 | 2 |
| Carbon black | 1333-86-4 | 1 |
| 1,1-Difluoroethylene polymer | 24937-79-9 | 2.4 |
| Graphite | 7782-42-5 | 20 |
| Sodium carboxymethyl cellulose | 9004-32-4 | 1.3 |
| Styrene-Butadiene polymer | 9003-55-8 | 2 |
| Aluminum foil | 7429-90-5 | 7.5 |
| Copper | 7440-50-8 | 17.8 |
| Carbonate, methyl ethyl | 623-53-0 | 7 |
| Phosphate(1-), hexafluoro-, lithium | 21324-40-3 | 6.5 |

4. FIRST AID MEASURES

First aid measures

General Advice

First aid is upon rupture of sealed battery. Show this safety data sheet to the doctor in attendance

Eye Contact

Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Keep eye wide open while rinsing. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention if irritation develops and persists. Do not rub affected area

Skin Contact

Wash off immediately with soap and plenty of water for at least 15 minutes. In the case of skin irritation or allergic reactions see a physician. May cause an allergic skin reaction.

Inhalation

Remove to fresh air. If symptoms persist, call a physician. Get medical attention immediately if symptoms occur.

Ingestion

Do NOT induce vomiting. Rinse mouth immediately and drink plenty of water. Never give anything by mouth to an unconscious person. Call a physician.

Self-protection of the first aider

Avoid contact with skin, eyes or clothing. Use personal protective equipment as required. Wear personal protective clothing (see section 8)

Most important symptoms and effects, both acute and delayed

Most Important Symptoms and Effects

Coughing and/ or wheezing. Itching.

Indication of any immediate medical attention and special treatment needed

Notes to Physician

May cause sensitization of susceptible persons. Treat symptomatically

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media

Use extinguishing measures that are appropriate to local circumstances and the surrounding

environment.

Unsuitable Extinguishing Media

CAUTION: Use of water spray when fighting fire may be inefficient

Specific Hazards Arising from the Chemical

Product is or contains a sensitizer. May cause sensitization by skin contact.

Uniform Fire Code Irritant: Solid

Hazardous Combustion Products

Carbon Oxides

Explosion Data

Sensitivity to Mechanical Impact No.

Sensitivity to Static Discharge No.

Protective equipment and precautions for firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand,MSHA/NIOSH (approved or equivalent) and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal Precautions Avoid contact with skin, eyes or clothing. Ensure adequate ventilation. Use personal. protective equipment as required. Evacuate personnel to safe areas.

Other Information Refer to protective measures listed in Sections 7 and 8

Environmental Precautions

Environmental Precautions Refer to protective measures listed in Sections 7 and 8.

Methods for cleaning up Pick up and transfer to properly labeled containers

Methods for Containment Prevent further leakage or spillage if safe to do so.
Methods for cleaning up Pick up and transfer to properly labeled containers.

7. HANDLING AND STORAGE

Precautions for safe handling

Handling In case of rupture. Use personal protection equipment. Avoid contact with skin, eyes or clothing.

Conditions for safe storage, including any incompatibilities

Storage Keep containers tightly closed in a dry, cool and well-ventilated place.

Incompatible Products Strong acids. Strong oxidizing agents. Strong bases.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure Guidelines

| Chemical Name | ACGIH TLV | OSHA PEL | NIOSH IDLH |
|----------------|-----------------------------|----------|------------|
| Cobalt lithium | TWA: 0.02 mg/m ³ | | |

| | | | |
|--|--|---|---|
| manganese nickel oxide 182442-95-1 | | | |
| Graphite 7782-42-5 | TWA: 2 mg/m ³ respirable fraction all forms except graphite fibers | TWA: 15 mg/m ³ total dust synthetic TWA: 5 mg/m ³ respirable fraction synthetic (vacated) TWA: 2.5 mg/m ³ respirable dust natural (vacated) TWA: 10 mg/m ³ total dust synthetic (vacated) TWA: 5 mg/m ³ respirable fraction synthetic TWA: 15 mppcf natural | IDLH: 1250 mg/m ³ TWA: 2.5 mg/m ³ respirable dust |
| Copper 7440-50-8 | TWA: 0.2 mg/m ³ fume TWA: 1 mg/ mg/m ³ Cu dust and mist | TWA: 0.1 mg/m ³ fume TWA: 1 mg/m ³ dust and mist (vacated) TWA: 0.1 mg/m ³ Cu dust, fume, mist | IDLH: 100 mg/m ³ dust, fume and mist TWA: 1 mg/m ³ dust and mist TWA: 0.1 mg/m ³ fume |
| Aluminum foil 7429-90-5 | TWA: 1 mg/m ³ respirable fraction | TWA: 15 mg/m ³ total dust TWA: 5 mg/m ³ respirable fraction (vacated) TWA: 15 mg/m ³ total dust (vacated) TWA: 5 mg/m ³ respirable fraction (vacated) TWA: 5 mg/m ³ Al Aluminum | TWA: 10 mg/m ³ total dust TWA: 5 mg/m ³ respirable dust |
| Carbon black 1333-86-4 | TWA: 3 mg/m ³ inhalable fraction | TWA: 3.5 mg/m ³ (vacated) TWA: 3.5 mg/m ³ | IDLH: 1750 mg/m ³ TWA: 3.5 mg/m ³ TWA: 0.1 mg/m ³ Carbon black in presence of Polycyclic aromatic hydrocarbons PAH |

ACGIH TLV: American Conference of Governmental Industrial Hygienists - Threshold Limit Value OSHA PEL: Occupational Safety and Health Administration - Permissible Exposure Limits NIOSH IDLH Immediately Dangerous to Life or Health

Other Exposure Guidelines Vacated limits revoked by the Court of Appeals decision in AFL-CIO v. OSHA, 965 F.2d 962 (11th Cir., 1992) See section 15 for national exposure control parameters

Appropriate engineering controls
Engineering Measures Showers
 Eyewash stations
 Ventilation systems

Individual protection measures, such as personal protective equipment

Eye/Face Protection If splashes are likely to occur: Wear safety glasses with side shields (or goggles). None required for consumer use.

Skin and Body Protection Wear protective gloves and protective clothing. Long sleeved clothing. Impervious gloves

Respiratory Protection No protective equipment is needed under normal use conditions. If exposure limits are exceeded or irritation is experienced, ventilation and evacuation may be required.

Hygiene Measures Handle in accordance with good industrial hygiene and safety practice. Do not eat, drink or smoke when using this product. Take off contaminated clothing and wash before reuse. Avoid contact with skin, eyes or clothing. Wear suitable gloves and eye/face protection. Wash hands before breaks and immediately after handling the product.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical and Chemical Properties

| | | | |
|-----------------------|--------------------------|-----------------------|--------------------------|
| Physical State | Solid | Odor | Odorless |
| Appearance | Silver | Odor Threshold | No information available |
| Color | No information available | | |

| <u>Property</u> | <u>Values</u> | <u>Remarks/ Method</u> |
|--|-------------------|------------------------|
| pH | No data available | None known |
| Melting / freezing point | No data available | None known |
| Boiling point / boiling range | No data available | None known |
| Flash Point | No data available | None known |
| Evaporation Rate | No data available | None known |
| Flammability (solid, gas) | No data available | None known |
| Flammability Limit in Air | | |
| Upper flammability limit | No data available | |
| Lower flammability limit | No data available | |
| Vapor pressure | No data available | None known |
| Vapor density | No data available | None known |
| Specific Gravity | No data available | None known |
| Water Solubility | No data available | None known |
| Solubility in other solvents | No data available | None known |
| Partition coefficient: n-octanol/water | 0.00001 | None known |
| Autoignition temperature | No data available | None known |
| Decomposition temperature | No data available | None known |
| Kinematic viscosity | No data available | None known |
| Dynamic viscosity | 0.00001 | None known |
| Explosive properties | No data available | |
| Oxidizing Properties | No data available | |

Other Information

| | |
|-----------------------------------|-------------------|
| Softening Point | No data available |
| VOC Content (%) | No data available |
| Particle Size | No data available |
| Particle Size Distribution | |

10. STABILITY AND REACTIVITY

Reactivity

No data available

Chemical stability

Stable under recommended storage conditions.

Possibility of Hazardous Reactions

None under normal processing.

Hazardous Polymerization

Hazardous polymerization does not occur.

Conditions to avoid

None known based on information supplied.

Incompatible materials

Strong acids. Strong oxidizing agents. Strong bases.

Hazardous Decomposition Products

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

| | |
|----------------------------|--|
| Product Information | Product does not present an acute toxicity hazard based on known or supplied information In case of rupture |
| Inhalation | Specific test data for the substance or mixture is not available. Corrosive by inhalation.(based on components). |
| Eye Contact | Specific test data for the substance or mixture is not available. Expected to be and irritant based on components. Irritating to eyes. May cause redness, itching, and pain. May cause temporary eye irritation. |
| Skin Contact | Specific test data for the substance or mixture is not available. Expected to be an irritant based on components. Irritating to skin. Prolonged contact may cause redness and irritation. |
| Ingestion | Specific test data for the substance or mixture is not available. Ingestion may cause irritation to mucous membranes. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea. May be harmful if swallowed. (based on components). |

Component Information

| Chemical Name | Oral LD50 | Dermal LD50 | Inhalation LC50 |
|---------------------------|-----------------------|---------------------|-----------------|
| Graphite 7782-42-5 | > 10000 mg/kg (Rat) | - | - |
| Carbon black 1333-86-4 | > 15400 mg/kg (Rat) | > 3 g/kg (Rabbit) | - |

Information on toxicological effects

Symptoms Erythema (skin redness). May cause redness and tearing of the eyes. Itching.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Sensitization May cause sensitization of susceptible persons. May cause sensitization by skin contact. May cause sensitization by inhalation.

Mutagenic Effects No information available

Carcinogenicity The table below indicates whether each agency has listed any ingredient as a carcinogen

| Chemical Name | ACGIH | IARC | NTP | OSHA |
|---|-------|---------------------|-------|------|
| Cobalt lithium manganese nickel oxide 182442-95-1 | A3 | Group 1 Group 2B | Known | X |
| Carbon black 1333-86-4 | A3 | Group 2B | | X |

ACGIH (American Conference of Governmental Industrial Hygienists)

A1 - Known Human Carcinogen

A3 - Animal Carcinogen

IARC (International Agency for Research on Cancer)

Group 1 - Carcinogenic to Humans

Group 2B - Possibly Carcinogenic to Humans

NTP (National Toxicology Program)

Known - Known Carcinogen

OSHA (Occupational Safety and Health Administration of the US Department of Labor)

X- Present

| | |
|---------------------------------|---|
| Reproductive Toxicity | No information available. |
| STOT - single exposure | No information available. |
| STOT - repeated exposure | Causes damage to organs through prolonged or repeated exposure. Based on classification criteria from the 2012 OSHA Hazard Communication Standard (29 CFR1910.1200), this product has been determined to cause systemic target organ toxicity from chronic or repeated exposure. (STOT RE). |
| Chronic Toxicity | No known effect based on information supplied. Contains a known or suspected carcinogen. Possible risk of irreversible effects. Avoid repeated exposure. Prolonged exposure may cause chronic effects. Repeated or prolonged skin contact may cause skin irritation and/or dermatitis and sensitization of susceptible persons. |
| Target Organ Effects | Respiratory system. Eyes. Skin. Gastrointestinal tract (GI). |
| Aspiration Hazard | No information available. |

Numerical measures of toxicity Product Information

The following values are calculated based on chapter 3.1 of the GHS document

ATEmix (oral)

ATEmix (dermal)

ATEmix (inhalation-dust/mist)

12. ECOLOGICAL INFORMATION

Ecotoxicity

Very toxic to aquatic life with long lasting effects.

| Chemical Name | Toxicity to Algae | Toxicity to Fish | Toxicity to Microorganisms | Daphnia Magna (Water Flea) |
|---------------------------|---|---|----------------------------|----------------------------|
| Copper 7440-50-8 | 96h EC50: 0.031 - 0.054 mg/L (Pseudokirchneriella subcapitata) 72h EC50: 0.0426 - 0.0535 mg/L (Pseudokirchneriella subcapitata) | 96h LC50: 0.0068 - 0.0156 mg/L (Pimephales promelas) 96h LC50: = 0.112 mg/L (Poecilia reticulata) 96h LC50: = 0.3 mg/L (Cyprinus carpio) 96h LC50: = 0.8 mg/L (Cyprinus carpio) 96h LC50: = 1.25 mg/L (Lepomis macrochirus) 96h LC50: = 0.052 mg/L (Oncorhynchus mykiss) 96h LC50: = 0.2 mg/L (Pimephales promelas) 96h LC50: < 0.3 mg/L (Pimephales promelas) | | 48h EC50: = 0.03 mg/L |
| Carbon black 1333-86-4 | | | | 24h EC50: > 5600 mg/L |

Persistence and Degradability

No information available.

Bioaccumulation

No information available

Other adverse effects

No information available.

13. DISPOSAL CONSIDERATIONS

Waste treatment methods

Disposal methods

Should not be released into the environment.

Contaminated Packaging

Dispose of in accordance with federal, state and local regulations.

California Hazardous Waste Codes 141

| Chemical Name | California Hazardous Waste |
|--|----------------------------|
| Cobalt lithium manganese nickel oxide 182442-95-1 | Toxic |
| Aluminum foil 7429-90-5 | Ignitable powder |
| Copper 7440-50-8 | Toxic |

14. TRANSPORT INFORMATION

Note:

The transportation of primary lithium cells and batteries is regulated by the International Civil Aviation Organization, International Air Transport Association, International Maritime Dangerous Goods Code and the US Department of Transportation. The batteries must meet the following criteria for shipment: 1. Air shipments must meet the requirements listed in Special Provision A45 of the International Air Transport Association Dangerous Goods Regulations. 2. Meet the requirements for the US Department of Transportation listed in 49 CFR 173.185. 3. The transport of primary lithium batteries is prohibited aboard passenger aircraft. Refer to the Federal Register December 15, 2004 (Hazardous Materials; Prohibited on the Transportation of Primary Lithium Batteries and Cells Aboard Passenger Aircraft; Final Rule) Lithium batteries shipped as "Lithium batteries", "Lithium batteries packed with equipment", or "Lithium batteries contained in equipment" may not be classified as "Dangerous Goods" when shipped in accordance with "special provision A45 of IATA-DGR" or "special provision 188 of IMO-IMDG Code"

DOT

Proper Shipping Name
Hazard Class

NOT REGULATED
NON REGULATED
N/A

TDG

MEX

ICAO

IATA

Proper Shipping Name
Hazard Class

Not regulated
Not regulated
Not regulated
Not regulated

IMDG/IMO

Proper Shipping Name
Hazard Class

Not regulated
NON-REGULATED PER SP 188
N/A

EmS No.

F-A, S-I

RID

ADR

AND

Not regulated
Not regulated
Not regulated

15. REGULATORY INFORMATION

International Inventories

TSCA Complies

DSL All components are listed either on the DSL or NDSL.

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory

DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List

US Federal Regulations

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

| Chemical Name | CAS No | Weight-% | SARA 313 - Threshold Values % |
|---------------------------------------|-------------|----------|-------------------------------|
| Cobalt lithium manganese nickel oxide | 182442-95-1 | 32.5 | 1.0 0.1 |
| Aluminum foil | 7429-90-5 | 7.5 | 1.0 |
| Copper | 7440-50-8 | 17.8 | 1.0 |

SARA 311/312 Hazard Categories

| | |
|-----------------------------------|----|
| Acute Health Hazard | No |
| Chronic Health Hazard | No |
| Fire Hazard | No |
| Sudden release of pressure hazard | No |
| Reactive Hazard | No |

CWA (Clean Water Act)

This product contains the following substances which are regulated pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

| Chemical Name | CWA - Reportable Quantities | CWA - Toxic Pollutants | CWA - Priority Pollutants | CWA - Hazardous Substances |
|--|-----------------------------|------------------------|---------------------------|----------------------------|
| Copper 7440-50-8 | | X | X | |
| Cobalt lithium manganese nickel oxide 182442-95-1 | | X | | |

CERCLA

This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302)

| Chemical Name | Hazardous Substances RQs | Extremely Hazardous Substances RQs | RQ |
|---------------------|--------------------------|------------------------------------|--|
| Copper 7440-50-8 | 5000 lb | | RQ 5000 lb final RQ RQ 2270 kg final RQ |

US State Regulations

California Proposition 65

This product contains the following Proposition 65 chemicals.

| Chemical Name | California Proposition 65 |
|---|---------------------------|
| Carbon black - 1333-86-4 | Carcinogen |
| Cobalt lithium manganese nickel oxide - 182442-95-1 | Carcinogen |

U.S. State Right-to-Know Regulations

| Chemical Name | New Jersey | Massachusetts | Pennsylvania | Rhode Island | Illinois |
|---|------------|---------------|--------------|--------------|----------|
| Lithium nickel cobalt manganese oxide 182442-95-1 | X | | X | X | X |
| Graphite 7782-42-5 | X | X | X | | |
| Copper 7440-50-8 | X | X | X | X | X |
| Aluminum foil 7429-90-5 | X | X | X | X | |
| Carbon black 1333-86-4 | X | X | X | | X |

International Regulations

Mexico

National occupational exposure limits

| Component | Carcinogen Status | Exposure Limits |
|---|-------------------|-----------------------------------|
| Cobalt lithium manganese nickel oxide 182442-95-1(32.5%) | | Mexico: TWA 0.2 mg/m ³ |
| Graphite 7782-42-5(20%) | | Mexico: TWA= 2 mg/m ³ |
| Copper | | Mexico: TWA= 1 mg/m ³ |

| | | |
|----------------------------------|--|---|
| 7440-50-8(17.8%) | | Mexico: TWA= 0.2 mg/m ³ Mexico: STEL= 2 mg/m ³ |
| Aluminum foil 7429-90-5(7.5%) | | Mexico: TWA= 10 mg/m ³ |
| Carbon black 1333-86-4(1%) | | Mexico: TWA 3.5 mg/m ³ Mexico: STEL 7 mg/m ³ |

Mexico - Occupational Exposure Limits - Carcinogens

Canada
WHMIS Hazard Class
Not determined

16. OTHER INFORMATION

NFPA Health Hazards 1 Flammability 0 Instability 0 **Physical and Chemical Hazards - Personal Protection**
HMIS Health Hazards 3 * Flammability 0 Physical Hazard 0 X

Chronic Hazard Star Legend * = Chronic Health Hazard

Prepared By Firstar Battery Co., Limited

Issuing Date
Revision Date 17-Feb-2016
Revision Note No information available

Disclaimer
 The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text

End of Safety Data Sheet