MATERIAL SAFETY DATA SHEET

File No:BYDNT02-230302-1

Product Name	Lithium Ion Battery

1. Product Identification;

Product Name	Lithium Ion Battery
Company of Producing	BYD
Battery Type	PSL456687
Rated capacity	4620mAh
Nominal voltage	3.89V
Watt-hour Rating	17.97Wh
Model:	NT02

2. Composition/Information on Ingredients

Composition	CAS No.	Wt%
Lithium Cobalt Oxide	12190-79-3	25-45
PVDF	24937-79-9	0.2-1.0
Electrolytic copper foil	7440-50-8	5-25
graphite	7782-42-5	5-25
SBR	9003-55-8	0.5-2.0
LiPF6	21324-40-3	0-5
PP	9003-07-0	0-5
PE	9002-88-4	0-5
Nickel	7440-02-0	0.1-1.5
Aluminum	7429-90-5	4-8

3. Hazard Identification

Material	Emergency Overview (Appearance)	Toxicity (Potential Health Effects)
Lithium Cobalt Oxide	Blue-Black Powder (odorless)	Cobalt and Cobalt compounds are considered to be possible human carcinogen(s) .By IARC: May irritate eyes, skin, nose ,throat, and respiratory system May cause allergic skin sensitization (rash)
Carbon	Black Powder (odorless)	No cases of carbon being harmful to humans have been reported. WHO and ILO have never verified that carbon irritation of the skin and mucous membrane, etc. In some individuals

Bond	Odorless White Powder CAUTION! MELT PROCESSING RELEASES VAPORS WHICH MAY CAUSE EYE, 2	Inhalation and skin contact are expected to be the primary routes of occupational exposure to this material .As a finished product ,it is a synthetic, high molecular weight polymer . due to its chemical and physical properties , this material dos not require special handing other than the good industrial hygiene and safety practical employed with any industrial material of this type . Under normal processing conditions , this material release fame or vapor components of these release may vary with processing time and temperatures . These process releases may produce eye , skin and/or respiratory tract irritation and , with repeated or prolonged exposures .,nausea , drowsiness , headache and weakness Although unlikely under normal handling conditions , if this material is heated in excess of 600F(315C) hazardous , decomposition products will be produced . hazardous decomposition products include hydrogen fluoride and oxides of carbon , the concentrations of which vary with temperature and heating regimens
Electrolyte	Colorless Liquid WARNING! FLAMMABLE. REACTS WITH WSTER TO FORM HYDROFLUORIC ACID. MAY CAUSE BURNS TO SKIN AND EYES EFFECTS MAY BE DELEYED. MAY CAUSE BLINDNESS. PROBABLE REPRODUCTIVE HAZARD.	May cause moderate to severe irritation, burring , and dryness of the skin. May cause eye irritation or burning .Breathing of the mists, vapors or fumes may irritate the nose, throat and lungs or fumes may irritate the nose throat and lungs Exposure of material with areas which contain water may generate hydrofluoric acid which can cause immediate burns on skin, severe eye bums burns to the mouth and gastrointestinal tract if ingested, and laryngeal edema if inhaled. Direct exposure to areas of the body need to be treated immediately to prevent injury

4. First Aid Measures

- Eyes:
  Flush with water for at least 15 minutes. If irritation occurs and persists, contact a medical doctor.

- Skin:
  Remove contaminated clothing and thoroughly wash with soap and plenty of water. If irritation persists, contact a medical doctor.
- Inhalation:
  Remove to fresh air. If breathing difficulty or discomfort occurs and persists, see a medical doctor. If breathing has stopped, give artificial respiration and see a medical doctor IMMEDIATELY.

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5. Fire Fighting Measures

- Hazardous Combustion Products:
  When burned, hazardous products of combustion including fumes of carbon monoxide, carbon dioxide, and fluorine can occur.
  Extinguishing Media: Water, carbon dioxide, dry chemical, or foam.
- Basic Fire Fighting Procedures:
  Wear NIOSH/MSHA approved positive pressure self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.
  Unusual Fire & Explosion Hazards: This material does not represent an unusual fire or explosion hazard.
  Auto-ignition Temperature: No Data.
  Flammability Limits in Air, Lower, % by Volume: 1.4
  Flammability Limits in Air, Upper, % by Volume: 11

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6. Accidental Release Measures

- Procedure for Release and Spill:
  Sweep up and place in a suitable container, Dispose of waste according to all local, state and Federal Laws and Regulations.
  Before cleanup measures begin, review the entire MSDS with particular attention Potential Health Effects; and on Recommended Personal Protective Equipment.

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7. Handling and storage

Material things Handling: Avoid contact with eyes, skin or clothing, use with adequate ventilation. Wear safety glasses and rubber gloves. Wash thoroughly after handling.

Material	Storage
Lithium Cobalt Oxide	Keep away from strong acids. Keep container closed.
Carbon	Store this material in a sealed enclosure to avoid dispersion of carbon fiber dust. Keep container closed.

Bond	Store in a cool, dry place. This material is not hazardous under normal storage condition; however, material should be stored in closed container, in a secure area to prevent container damage and subsequent spillage.
Electrolyte	Store in tightly closed containers in a cool, dry, isolated, well-ventilated area away from heat, sources of ignition and in compatibles. Store in original container. Keep from freezing. Avoid exposure to high temperatures

Cell Handling

Technical measures

Prevention of user exposure : Not necessary under normal use.

Prevention of fire and explosion : Not necessary under normal use.

Precaution for safe handling : Do not damage or remove the external tube. Specific safe handling advice : Never throw out cells in a fire or expose to high temperature. Do not soak cells in water and seawater. Do not expose to strong oxdizer. Do not give a strong mechanical shock or throw down. Never disassemble, modify or deform. Do not connect the positive terminal to the negative terminal with electrically conductive material. In the case of charging, use only dedicated charger or charge according to the conditions specified by BYD.

Cell Storage

Technical measures

Storage conditions (suitable, to be avoid) : Avoid direct sunlight, high temperature, high humidity. Store in cool place (temperature : -20 ~ 35 degree C, humidity : 45~85%).

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8. Exposure Controls/Person Protection.

- Engineering controls:

Investigate engineering techniques to reduce exposures use with adequate ventilation a Recommended personal protective Equipment

- Eye/Face protection:

Use good industrial practice to avoid eye contact. Processing of this product releases vapors or fumes which may cause eye irritation. Where eye contact may be likely wear chemical goggles and have eye flushing equipment available

- Skin protection:

Minimize skin contamination by following good industrial hygiene practices Wearing protective gloves is recommended Wash hands and contaminated skin thoroughly after handling.

- Respiratory protection:

Avoid breathing dust and processing vapors When adequate ventilation is not available wear a NIOSH/MSHA respirator approved for protection against inorganic dusts.

Special clothing: Robber gloves.

- Other:

Quick-drench eye wash and safety shower.

9. Physical and Chemical Properties

Material	Appearance Pressure	Odor	Molecular Weight	Vapor
LiCoO2	Solid, Blue-Black Powder	Odorless	97.88	-
Carbon	Black Powder	Odorless	12.01	-
Copper	Metal	Odorless	63.55	-
Nickel	Metal	Odorless	58.69	-
Aluminum	Metal	Odorless	26.98	-
Electrolyte Colorless Liquid, with a mild (EC/DEC/EMC/1molLiPF6)	Volatile	organic odor	-	-

Material	Sublimating Point	Freezing Point/ Melting Point	Solubility in water	Density (Specific Gravity)
LiCoO2	-	>1000 deg.C(1280 deg.F)	Insoluble	-
Carbon	3000℃ or more	-	Insoluble	2.2 g/ml
Copper	-	1083℃	Insoluble	8.96 g/ml
Nickel	-	1555℃	Insoluble	8.91g/ml
Aluminum	-	660℃	Insoluble	2.7 g/ml
Electrolyte (EC/EMC/DEC/1molLiPF6)	-	126℃	Partial	1.22 (20/20℃)

10. Stability and Reactivity

Material	Stability	Incompatibility	Hazardous Polymerization	Hazardous Decomposition Products
LiCoO2	Stable	Acids	Dose not polymerize	None
Carbon	Stable	Strong oxidants	-	-
Bond	Stable	Strong base, ester, Dose not occur	HF, possible oxides of carbon	Ketones, Silica, Titanium
Electrolyte Volatile	Strong reducers, Will not occur	Volatile pentafluoride compounds, bases, strong acids, Hydrogen fluoride, carbon	oxidizing agents, moist air or water.	Carbon dioxide and other decomposition product, etc.

		monoxide		

- Cell Stability : Stable under normal use
- Hazardous reactions occurring under specific conditions
- Conditions to avoid : When a battery cell is exposed to an external short-circuit, crushes, modification, high temperature above 100 degree C, it will be the cause of heat generation and ignition. Direct sunlight and high humidity.
- Materials to avoid : Conductive materials, water, seawater, strong oxidizers and strong acids.
- Hazardous decomposition products: Acrid or harmful gas is emitted during fire.

11. Toxicological information

There is no data available on the product itself. The information of the internal cell materials is as follows.

Lithium cobaltic – LiCoO2

- Acute toxicity: Unknown.
- Local effects: Unknown.
- Sensitization: The nervous system of respiratory organs may be stimulated sensitively.
- Chronic toxicity/Long term toxicity: By the inhalation of coarse particulate and steamy gas of cobalt, it is possible to cause the serious respiratory-organs disease. The person of allergy-natured or sensitive-natured may cause a skin reactionary lung disease.
- Local effects (skin): Although it is very rare, the rash of the skin and allergic erythema may result.

Graphite

- Acute toxicity: Unknown.
- Local effects: Unknown.
- Chronic toxicity/Long term toxicity: Since the prolonged inhalation under the high concentration of a graphite coarse particulate may become a cause of a lung disease or a tracheal disease, it is regulated by the coarse particulate obstacle prevention rule and the dust-lung method enforcement regulations.
- Carcinogen city: Graphite is not recognized as a cause of cancer by research organizations and natural toxic substance research organizations of cancer.

Copper foil

- Acute toxicity: Coarse particulate stimulates a nose and a tracheal. LD50, oral-sheep 18,000-182,000mg/kg 60-100mg of coarse particulate causes a gastrointestinal disturbance with nausea and inflammation.
- Local effects: Unknown. Organic Electrolyte
- Acute toxicity : LD50, oral-rat 2,000mg/kg or more
- Local effects : Unknown.▪ Skin irritation study : Rabbit – Mild
- eye irritation study : Rabbit - Very severe

12. Ecological Information

Eco Toxicological Information: No information available.
Chemical Fate Information: No data are available.
Environmental Effects: No data are available.

13. Disposal Information

Ensure disposal of material in compliance with all local. State and Federal-Laws and Regulations.

14. Transport Information

In the case of transportation, confirm no leakage and no overspill from a container. Take in a cargo of them without falling, dropping and breakage. Prevent collapse of cargo piles and wet by rain. The container must be handled carefully. Do not give shocks that result in a mark of hitting on a cell. Please refer to Section 7-HANDLING AND STORAGE also.

Codes and classifications according to:
International regulations for transport Air IATA-DGR : PI 965/966/967
International regulations for transport Sea IMDG CODE: special provision 188
National regulations for transport land GB12268
The UN classification number: Class 9 3480

However, since it corresponds to special provision PI 965/966/967 of IATA-DGR, special provision 188 of IMDG CODE, GB12268 of land regulation, this battery cell can be conveyed normally.

Lithium ion battery dose not contains any recalled/defective battery and meeting Packing Instruction 965 IB /966 II /967 II of IATA DGR

Production of MSDS proving UN manual of Tests and Criteria, part III, sub-section 38.3 is met on MSDS.

15. Regulatory Information

OSHA Hazard communication standard(29 CFR 1910.1200)
_____Hazardous _____√_____Non-hazardous

16. Other Information

The information contained in this Safety date sheet is based on the present state of knowledge and current legislation.

This safety date sheet provides guidance on health. Safety and environmental aspects of the product and should not be construed as any guarantee of technical performance or suitability for particular applications.

17. Reference

Chemical substances information: Japan Advanced Information center of Safety and Health International Chemical Safety Cards (ICSCs):

International Occupational Safety and Health Information Centre (CIS)

1999 TLVs and BEIs: American Conference of Governmental Industrial Hygienists (ACGIH)

Dangerous Goods Regulations: 64th Edition of IATA DGR Effective 01 January 2023: International Air Transport Association (IATA)

IMDG CODE 2020 edition: International Maritime Organization (IMO)

GB12268 Effective 1 December 2012: Standardization Administration of the People's Republic of China

MSDS of raw materials by prepared by the manufactures

;last data revised 2023-01-01

The material safety data sheet is furnished to every manufacturer as a reference to secure the safe handling of chemical. Every manufacturer is requested to carry out appropriate actions for chemical handling as their own responsibility. The supplier makes no warrantee, either express or implied. concerning of this products. User assumes all risks resulting from its use.

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