Material Safety Data Sheet

Name: Rechargeable Li-ion Battery
Trade Name:XR-RKD-01 3.85V,Rated Capacity:5000mAh 19.25Wh

Shanghai BYD Company Limited

MATERIAL SAFETY DATA SHEET

Product Name	Li-ion Rechargeable Battery

1.Product Identification:

Pack Type:	5000mAh/3.85V/19.25Wh
Cell Type:	544761R 2500mAh 3.85V/9.625Wh
Company of Producing	SHANGHAI BYD COMPANY LIMITED
Watt/hour rating (Wh):	Cell upper limit: 20Wh; Battery upper limit: 100Wh

2.Composition/Information on Ingredients

Hazardous Ingredients	%	CAS Number
Lithium Cobalt Oxide	15~45	12190-79-3
Graphite	7~25	7782-42-5
Aluminum	5~20	7429-90-5
Polyvinylidene Fluoride (PVDF)	0~5	24937-79-9
Copper Foil	2~10	7440-50-8
Carbon black	0~2	1333-86-4
Styrene-Butadiene-Rubber	0~2	27288-99-9
Lithium Hexafluorophosphate	0~5	21324-40-3
Ethylene carbonate	0~10	96-49-1
Dimethyl carbonate	0~10	616-38-6
Diethyl carbonate	0~10	105-58-8
Nickel	0~5	7440-02-0
Polyethylene	0~5	9002-88-4

3. Hazard Identification

Health Hazards (Acute and Chronic):

For the battery cell, chemical materials are stored in a hermetically sealed aluminum laminate case, designed to withstand temperatures and pressures encountered during normal use. As a result, during normal use, there is no physical danger of ignition or explosion and chemical danger of hazardous materials leakage.

However, if exposed to a fire, added mechanical shocks, decomposed, or added electric stress by misuse the cell case will be breached and hazardous materials may be released. Moreover, if heated strongly by the surrounding fire, acrid gas may be emitted.

Carcinogenicity:

NTP: None IARC Monograph: None OSHA Regulated: None

Medical Conditions Generally Aggravated by Exposure:

An acute exposure will not generally aggravate any medical condition.

Human health effects:

Inhalation: The steam of the electrolyte has an anesthesia action and stimulated a respiratory tract.

Skin contact: The steam of the electrolyte stimulates a skin. The electrolyte skin contact causes a sore and the stimulation on the skin.

Eye contact: The steam of the electrolyte stimulates eyes. The electrolyte eye contact causes a sore and the stimulation on the eye. Inflammation of the eyes may occur.

Environmental effect:

Since a battery cell remains in the environment, do not throw out it into the environment.

Specific hazards:

If the electrolyte contacts with water, it may generate detrimental hydrogen fluoride.

Since the leaked electrolyte is inflammable liquid, do not bring close to fire.

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.

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.

Flash Point: 38℃ (CC) (100F)

Autolgnition Temperature: No Data.

Flammability Limits in Air, Lower, % by Volume: 1.4

Flammability Limits in Air, Upper, % by Volume: 11

6. Accidental Release Measures

Procedure for Release and Spill:

Sweep up and place in a suitable container, dispose or 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.

7. Handling and storage

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 temperatures. Do not soak cells in water and seawater. Do not expose to strong oxidizers. 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 avoided): Avoid direct sunlight, high temperature, high humidity.
Store in cool place (temperature: 0 ~ 45 degree C, humidity: 〈60%).

8. Exposure Controls/Person Protection.

Specific control parameter:
Personal protective equipment:
Respiratory protection (Specify Type): Not necessary under condition of normal use.
Ventilation: Not necessary under condition of normal use.
Protective Gloves: Not necessary under condition of normal use.
Eye protection: Not necessary under condition of normal use.
Other Protective: Not necessary under condition of normal use.

9. Physical and Chemical Properties

Appearance

Physical state:	Solid
Form:	Laminated
Color:	Gray and black
Odor:	No odor

PH	NA
Flash point	NA

10. Stability and Reactivity

Material	Stability	Incompatibility	Hazardous Polymerization	Hazardous Decomposition Products
$LiCoO_2$	Stable	Acids	Dose not polymerize	None
Carbon	Stable	Strong oxidants	_	_
Bond	Stable	Strong base, ester,	Dose not occur	HF, possible oxides of carbon Ketones, Sillca Titanium .
Electrolyte	Volatile	Strong reducers, bases, strong acids, oxidizing agents, moist air or water.	Will not occur	Volatile pentafluoride compounds, hydrogen fluoride, carbon monoxide Carbon dioxide and other decomposition product, etc.

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. Ecological Information

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

Toxicological Information

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

Lithium cobaltic – $LiCoO_2$

- 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. Disposal Information

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

13. 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: Special Provisions: A48, A88, A154, A164, A181, A182 and Section IB or II OF PI 965/966/967 of IATA-DGR.

International regulations for transport Air IATA-DGR: The goods are packaged according to the Packaging Instruction 965.

International regulations for transport Sea IMDG CODE: special provision 188

National regulations for transport land GB12268-2005

The UN classification number: Class 9 3480 or 3481

However, since it corresponds to special provision Section II OF PI 965/966/967 of IATA-DGR, special provision 188 of IMDG CODE, GB12268-2005 of land regulation, this battery cell can be conveyed normally.

Lithium battery dose not contains any recalled/defective battery and meeting Packing Instruction Section II OF PI 965/966/967 of IATA-DGR

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

14. Regulatory Information

OSHA Hazard communication standard (29 CFR 1910.1200)

_____Hazardous _____√_____Non-hazardous

Sea transport/IMO/IMDG: not regulated.

15. UN Test Result

There are no hazards in accordance with the UN recommendations tests (Manual of Tests and Criteria, Part III, sub-section 38.3 7th)

NO	ITEMS	RESULT	REMARKS
1	Altitude Simulation	Pass	
2	Temperature Test	Pass	
3	Vibration	Pass	
4	Shock	Pass	
5	External Short circuit	Pass	
6	Crush	Pass	
7	Overcharge	Pass	
8	Forced Discharge	Pass	

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 1st January 2023: International Air Transport Association (IATA)

IMDG CODE Effective from 1st Jan. 2022: International Maritime Organization (IMO)

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

MSDS of raw materials by prepared by the manufactures

Last data revised 2023-1-21

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 product. User assumes all risks resulting from its use.

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