

## Safety Data Sheet (SDS)

The content and format of this SDS is accordant with 29 CFR 1910.1200 (OSHA standard)

### 1. Identification of the substance/preparation and of the company/undertaking

**Product details:**

**Product name:** Li-ion Battery 18650 3.7V 1200mAh 4.44Wh

**Product Model:** 18650 3.7V 1200mAh 4.44Wh

**Recommended use of the chemical and restrictions on use:** Power supply. Restrictions on use: Do NOT use it in an application which may contaminate food or do harm to human health.

**Manufacturer/Supplier:** SHENZHNE ZONYOU POWER CO., LTD

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**Further information obtainable from:** SHENZHNE ZONYOU POWER CO., LTD

**Information in case of emergency:** +86-755-29236421

### 2. Hazards identification

**This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)**

*(for contact with leakage from rupture):*

Physical hazards:	Not classified
Health hazards:	Acute toxicity (Oral) - Category 4 Skin corrosion/irritation - Category 1A Serious eye damage/eye irritation - Category 1 Reproductive Toxicity - Category 1B Specific target organ toxicity, repeated exposure - Category 1 (Bones, teeth)
Environmental hazards:	Hazardous to the aquatic environment, acute hazard - Category 3 Hazardous to the aquatic environment, long-term hazard - Category 3

**Signal Word: Danger**

**Pictograms:**



*Note: This product is generally not hazardous under normal conditions. But like any sealed container, battery may rupture when exposed to excessive heat and this could result in the release of hazardous materials. The information below is given to minimize any possible hazard during handling, storage and disposal.*

**Hazard Statements** *(for contact with leakage from rupture):*

H302: Harmful if swallowed.

- H314: Causes severe skin burns and eye damage.  
H318: Causes serious eye damage.  
H360: May damage fertility or the unborn child.  
H372: Causes damage to organs (Bones, teeth) through prolonged or repeated exposure.  
H402: Harmful to aquatic life.  
H412: Harmful to aquatic life with long lasting effects.

**Precautionary Statements** (for contact with leakage from rupture):

- P201: Obtain special instructions before use.  
P202: Do not handle until all safety precautions have been read and understood.  
P260: Do not breathe dust/fume/gas/mist/vapours/spray.  
P264: Wash hands thoroughly after handling.  
P270: Do not eat, drink or smoke when using this product.  
P273: Avoid release to the environment.  
P280: Wear protective gloves/protective clothing/eye protection/face protection.  
P281: Use personal protective equipment as required.

**Response Precautionary Statements** (for contact with leakage from rupture):

- P301 + P312: IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.  
P330: Rinse mouth.  
P301 + P330 + P331: IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.  
P303 + P361 + P353: IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.  
P363: Wash contaminated clothing before reuse.  
P304 + P340: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.  
P310: Immediately call a POISON CENTER or doctor/physician.  
P321: Specific treatment (Please see the specific measures for accident that included in the label, or go to hospital for treatment.)  
P305 + P351 + P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.  
P308 + P313: IF exposed or concerned: Get medical advice/attention.  
P314: Get medical advice/attention if you feel unwell.

**Storage precautionary statements:**

- P405: Store locked up.

**Disposal precautionary statements:**

- P501: Dispose of contents/container according to relevant local and national regulations. (It is recommended to recycle and reuse it.)

### 3. Composition/information on ingredients

**Product description:** substance ( ) ; preparation/mixture (√)

Ingredient (s)	CAS No.	EC No.	% by weight
Lithium Cobalt Oxide (CoLiO <sub>2</sub> )	12190-79-3	235-362-0	49.5
Graphite	7782-42-5	231-955-3	16.3
Phosphate(1-), hexafluoro-, lithium	21324-40-3	244-334-7	10.96

Aluminum	7429-90-5	231-072-3	7.6
Copper	7440-50-8	231-159-6	6.96
Polyethylene	9002-88-4	618-339-3	4.03
Poly[imino(1-oxo-1,12-dodecanediyl)], (nylon 12 chips) (Nylon)	24937-16-4	607-456-5	3.93
1,1-Difluoroethylene polymer	24937-79-9	607-458-6	0.33
Cellulose, carboxymethyl ether	9000-11-7	618-326-2	0.28
Nickel	7440-02-0	231-111-4	0.06
Styrene-Butadiene polymer	9003-55-8	618-370-2	0.05

#### 4. First aid measures

**As a general rule, in case of doubt or if symptoms persist, always call a doctor** (for contact with leakage from rupture):

**In the event of splashes or contact with eyes:** Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor/physician.

**In the event of splashes or contact with skin:** Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. Immediately call a POISON CENTER or doctor/physician. Wash contaminated clothing before reuse.

**In the event of exposure by inhalation:** Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or doctor/physician.

**In the event of swallowing:** Rinse mouth. Do not induce vomiting without doctor's instruction. Immediately call a POISON CENTER or doctor/physician.

**Acute effect and delayed effect:**

Acute effect: Harmful if swallowed. Causes severe skin burns and eye damage. Causes serious eye damage.

Delayed effect: May damage fertility or the unborn child. Causes damage to organs (Bones, teeth) through prolonged or repeated exposure.

**Personal protective equipment:** Wear protective gloves/protective clothing/eye protection/face protection when necessary.

**Indication of immediate medical attention and treatment needed, if necessary:** Treat according to symptoms and exposure Dose.

#### 5. Fire-fighting measures

**Extinguishing Media:** Use dry chemical, foam, CO<sub>2</sub> for extinction. Do not use direct water stream. Discharging cylinder shape water from fire hose may lead to spread fire to the surroundings.

**Unsuitable Extinguishing Media:** High volume water jet. Discharging cylinder shape water from fire hose may lead to spread fire to the surroundings.

**Special Fire Fighting Procedures:** Structural firefighters must wear self-contained breathing apparatus and full protective equipment.

**Unusual Fire and Explosion Hazards:** Cell may vent when subjected to excessive heat-exposing battery contents.

**Special Fire-Fighting Method:**

Fire-fighters must wear self-contained breathing apparatus and full protective equipment (e.g. fire-retardant clothing).

For initial fire, use dry powder, carbon dioxide, etc.

For large fire, it is effective to use fire foam, etc. to shut off air supply.

Deny unnecessary entry to the place around the fire.

Remove containers from fire area if it can be done without risk.

Cool surrounding facilities, etc. with water spray.

Extinguish fire from upwind, and the fire extinguishing method should be appropriate to the situation in the surroundings.

## 6. Accidental release measures

**Personal precautions, protective equipment and emergency procedures:** Use proper personal protective equipment as indicated in Section 8.

**Environmental precautions:** Keep cleaning run-offs out of municipal sewers and open bodies of water. Comply with local and national laws and regulations.

### Methods and material for containment and cleaning up:

If the battery material is released, remove personnel from area until fumes dissipate. Provide maximum ventilation to clear out hazardous gases. Wipe it up with a cloth, and dispose of it in a plastic bag and put into a steel can. The preferred response is to leave the area and allow the battery to cool and vapors to dissipate. Provide maximum ventilation. Avoid skin and eye contact or inhalation of vapors. Remove spilled liquid with absorbent and incinerate.

## 7. Handling and storage

### Precautions for safe handling:

#### Handling:

Do not breathe vapors or fumes that may be evolved during processing.

Do not disassemble or burn batteries.

Do not squeeze or pierce batteries.

Do not put batteries into water.

Workers must wear proper protective equipment and must operate strictly according to relative rules.

### Conditions for safe storage, including any incompatibilities:

Avoid mechanical or electrical abuse. Storage preferably in cool, dry and ventilated area, which is subject to little temperature change. Storage at high temperatures should be avoided. Do not place the battery near heating equipment, nor expose to direct sunlight for long periods.

**Incompatible substances or mixtures:** No relevant information.

**Packing material:** No relevant information.

## 8. Exposure controls/personal protection

### Control parameters:

Ingredients	OSHA PEL-TWA	ACGIH TLV-TWA
Lithium Cobalt Oxide (CoLiO <sub>2</sub> ) (CAS: 12190-79-3)	--	--
Graphite (CAS: 7782-42-5)	15 mppcf	2 mg/m <sup>3</sup>
Phosphate(1-), hexafluoro-, lithium (CAS: 21324-40-3)	--	--
Aluminum (CAS: 7429-90-5)	Total dust: 15 mg/m <sup>3</sup> Respirable fraction: 5 mg/m <sup>3</sup>	1 mg/m <sup>3</sup>
Copper (CAS: 7440-50-8)	1 mg/m <sup>3</sup>	1 mg/m <sup>3</sup>

Polyethylene (CAS: 9002-88-4)	--	--
Nylon (CAS: 24937-16-4)	--	--
1,1-Difluoroethylene polymer (CAS: 24937-79-9)	--	--
Cellulose, carboxymethyl ether (CAS: 9000-11-7)	--	--
Nickel (CAS: 7440-02-0)	1 mg/m <sup>3</sup>	1.5 mg/m <sup>3</sup>
Styrene-Butadiene polymer (CAS: 9003-55-8)	--	--

**Engineering Control:**

Use this product only in closed systems fully or with local exhaust ventilation.

Install washer eyes and safety showers near to the handling and storage area.

Shows the location of these facilities, with a clear and prominent warning board.

**Personal Protective Equipment (for workers):**

**Protection of Hands:**

Not necessary under conditions of normal use.

Recommend wearing protective gloves for industrial hygienic purpose (*for contact with leakage from rupture*).



**Protection of Eyes:**

Not necessary under conditions of normal use.

Wear safety glasses when working in a dusty environment or liquid may splash (*for contact with leakage from rupture*).



**Respiratory Protection:**

Not necessary under conditions of normal use.

Wear appropriate respirators when vapour or fume is generated from processing (*for contact with leakage from rupture*).



**Protection of Body:**

Recommend wearing general working clothing.



**General protective and hygienic measures:**

Keep away from foodstuffs, beverages and feed.

Wash hands before breaks and at the end of work.

Avoid contact with eyes and broken skin.

## 9. Physical and chemical properties

General Information	
Form	Solid
Color	No data available
Odor	No data available
Nominal voltage	No data available
Odor threshold	No data available
pH	No data available
Melting point/freezing point	No data available
Initial boiling point and boiling range	No data available
Flash point	No data available
Evaporation rate	No data available
Flammability (solid, gas, etc.)	Non-flammable
Upper/lower flammability or explosive limits	No data available
Vapor pressure	No data available
Vapor density	No data available
Relative density	No data available
Solubility (ies)	No data available
Partition coefficient: n-octanol/Water	No data available
Auto-ignition temperature	No data available
Decomposition temperature	No data available
Viscosity	No data available

## 10. Stability and reactivity

**Chemical stability:** Stable under normal temperatures and pressures.

**Possibility of hazardous reactions:** If leaked, the electrolyte may react violently with strong oxidizers, mineral acids, strong alkalis, halogenated hydrocarbons.

**Conditions to Avoid:** Heat above 70°C or incinerate. Deform. Mutilate. Crush. Disassemble. Overcharge. Short circuit. Expose over a long period to humid conditions.

**Incompatible materials:** If leaked, forbidden to contact with strong oxidizers, mineral acids, strong alkalis, halogenated hydrocarbons.

**Hazardous decomposition products:** It may release hazardous fume (e.g. Carbon monoxide, carbon dioxide, lithium oxide fumes) from thermal decomposition.

## 11. Toxicological information

**Product Toxicity Data:**

Ingredients	CAS No.	LD <sub>50</sub> / LC <sub>50</sub>
Lithium Cobalt Oxide (CoLiO <sub>2</sub> )	12190-79-3	Acute toxicity (Oral) LD <sub>50</sub> > 5,000 mg/kg (rat) Data source: ECHA Acute toxicity(Dermal) LD <sub>50</sub> > 2,000 mg/kg (rat) Data source: ECHA
Graphite	7782-42-5	Acute toxicity (Oral) LD <sub>50</sub> > 2,000 mg/kg (rat) Data source: ECHA
Phosphate(1-), hexafluoro-, lithium	21324-40-3	Acute toxicity (Oral) LD <sub>50</sub> : 50 - 300 mg/kg (rat) Data source: ECHA
Aluminum	7429-90-5	Acute toxicity (Oral) LD <sub>50</sub> > 15,900 mg/kg (rat) Data source: ECHA
Copper	7440-50-8	Acute toxicity (Oral) LD <sub>50</sub> > 2,500 mg/kg (rat) Data source: ECHA Acute toxicity(Dermal) LD <sub>50</sub> > 2,000 mg/kg (rat) Data source: ECHA
Polyethylene	9002-88-4	No data available
Nylon	24937-16-4	No data available
1,1-Difluoroethylene polymer	24937-79-9	No data available
Cellulose, carboxymethyl ether	9000-11-7	No data available
Nickel	7440-02-0	Acute toxicity (Oral) LD <sub>50</sub> > 9,000 mg/kg (rat) Data source: ECHA
Styrene-Butadiene polymer	9003-55-8	No data available
Classification of the whole product:		Acute toxicity (Oral) - Category 4

**Skin corrosion/irritation** (for contact with leakage from rupture):

Phosphate(1-), hexafluoro-, lithium (CAS: 21324-40-3): Category 1A (Data source: ECHA)

Classification of the whole product: Category 1A

**Serious eye damage/eye irritation** (for contact with leakage from rupture):

Phosphate(1-), hexafluoro-, lithium (CAS: 21324-40-3): Category 1 (Data source: ECHA)

Classification of the whole product: Category 1

**Respiratory sensitizer** (for contact with leakage from rupture):

No classification for this product.

**Skin sensitizer** (for contact with leakage from rupture):

Nickel (CAS: 7440-02-0): Category 1 (Data source: ECHA, EU CLP)

Classification of the whole product: Not classified

**Germ cell mutagenicity** (for contact with leakage from rupture):

No classification for this product.

**Carcinogenicity** (for contact with leakage from rupture):

Nickel (CAS: 7440-02-0): Category 2 (Data source: ECHA, EU CLP)

Classification of the whole product: Not classified

**Reproductive Toxicity** (for contact with leakage from rupture):

Lithium Cobalt Oxide (CAS: 12190-79-3): Category 1B (Data source: ECHA)

Classification of the whole product: Category 1B

**Specific target organ toxicity, single exposure** (for

No classification for this product.

*contact with leakage from rupture):*

**Specific target organ toxicity, repeated exposure** (for *contact with leakage from rupture):* Phosphate(1-), hexafluoro-, lithium (CAS: 21324-40-3): Category 1 (Bones, teeth) (Data source: ECHA)

Nickel (CAS: 7440-02-0): Category 1 (lungs) (Data source: ECHA, EU CLP)

Classification of the whole product: Category 1 (Bones, teeth)

**Aspiration hazard** (for *contact with leakage from rupture):* No classification for this product.

**Effects on or via lactation** (for *contact with leakage from rupture):* No classification for this product.

## 12. Ecological information

### Ecotoxicity:

Lithium Cobalt Oxide (CAS: 12190-79-3):

96h-LC<sub>50</sub>: 85.3 mg/L, fish (Danio rerio) (ECHA)

Graphite (CAS: 7782-42-5):

96h-LC<sub>50</sub> > 100 mg/L, fish (Danio rerio) (ECHA)

Lithium hexafluorophosphate (CAS: 21324-40-3):

96h-LC<sub>50</sub>: 369 mg/L, fish (ECHA)

Aluminum (CAS: 7429-90-5):

96h-LC<sub>50</sub>: 44.8 mg/L, fish (Pimephales promelas) (ECHA)

Copper (CAS: 7440-50-8):

96h-LC<sub>50</sub>: 1.1 mg/L, fish (Lepomis macrochirus) (ECHA)

12d-NIOEC: 0.123 mg/L, fish (Atherinops affinis) (ECHA)

Hazardous to the aquatic environment, acute hazard - Category 2 (CLP)

Hazardous to the aquatic environment, long-term hazard - Category 2 (CLP)

Nickel (CAS: 7440-02-0):

24h-LC<sub>50</sub>: 54.43 mg/L, fish (Poecilia reticulata) (ECHA)

Classification of the whole product:

Hazardous to the aquatic environment, acute hazard - Category 3

Hazardous to the aquatic environment, long-term hazard - Category 3

**Persistence and Degradability:** No data available.

**Bioaccumulative Potential:** No information available.

**Mobility in Soil:** No information available.

**Results of PBT and vPvB Assessment:** No information available.

### General Notes:

Do not throw used product into ground water, water course or sewage system.

Do not allow material to be released to the environment without proper governmental permits.



### 13. Disposal considerations

It is recommended to recycle and reuse it.

Any disposal practice must be in compliance with country, local, state, and federal laws and regulations.

After contents are completely removed, dispose of its container at hazardous or special waste collection point.

Paste a label on the container indicating the possible hazards of the waste.

### 14. Transport Information

#### DOT/ Air-Transportation- IATA/ICAO/Sea-Transportation-IMO/IMDG.:

Area	Method	Organization	Special Provision
International	Air	IATA, ICAO	Packing Instruction 967-Section II (regulated under the current 2022 Edition of the ICAO Technical Instruction for the Safe Transport of Dangerous Goods by Air and the 63 <sup>th</sup> Edition of IATA DGR) IMP: ELI Limit per Package: Pax A/C = 5 kg CAO = 5 kg
Europe	Road and Rail	ADR/RID	SP 188
International	Marine	IMDG	SP 188
U.S.A	Rail, Road, Marine	DOT	DOT 49 CFR 173.185

**Proper Shipping Name:** LITHIUM ION BATTERIES CONTAINED IN EQUIPMENT

**UN Number:** UN 3481

**Hazard Classification:** Class 9

**Shipping Requirements:**

**DOT:** Lithium batteries and cells are subject to shipping requirements exceptions under 49 CFR 173.185.

**IATA:** This product is not classified as dangerous under the current 63<sup>nd</sup> (2022) Edition of the IATA-DGR and the packing is in accordance with Section II packing requirements (PI 967).

We further hereby certify that the consignment have already carried on UN38.8 Test in accordance to IATA-DGR.

**Special precautions for user:**

Check whether the package is completed or sealed before transporting; make sure no damage of packages and prevent goods from falling down during transporting; the transport vehicle should be equipped with facilities for fire-fighting and accidental release handling; do NOT transport this product together with incompatible substances; stay away from fire and areas of high temperature during stopovers.

### 15. Regulatory information

**United States:**

**Section 355 (extremely hazardous substances):** Not listed.

**SARA 313:** Aluminum (CAS: 7429-90-5), Copper (CAS: 7440-50-8), Nickel (CAS: 7440-02-0).

**Toxic Substances Control Act (TSCA):**

Ingredient (s)	CAS No.	TSCA
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Lithium Cobalt Oxide	12190-79-3	Listed
Graphite	7782-42-5	Listed
Phosphate(1-), hexafluoro-, lithium	21324-40-3	Listed
Aluminum	7429-90-5	Listed
Copper	7440-50-8	Listed
Polyethylene	9002-88-4	Listed
Nylon	24937-16-4	Not listed
1,1-Difluoroethylene polymer	24937-79-9	Listed
Cellulose, carboxymethyl ether	9000-11-7	Listed
Nickel	7440-02-0	Listed
Styrene-Butadiene polymer	9003-55-8	Listed

**Clean Water Act:**

Chemical Name	CWA - Reportable Quantities	CWA - Hazardous Substances	CWA - Priority Pollutants	CWA - Toxic Pollutants
Copper (CAS: 7440-50-8)	2270 kg	listed	listed	listed
Nickel (CAS: 7440-02-0)	45.4 kg	listed	listed	listed

**Carcinogenicity categories:** Nickel (CAS: 7440-02-0): IARC-2B.

**Other relevant laws and regulations:**

**Candidate List of Substances of very high concern (SVHC) according to ECHA:** Not listed.

**REACH Regulation Annex XVII Regulation List:** Nickel (CAS: 7440-02-0).

**REACH Regulation Annex XIV Authorization List:** Not listed.

**Germany – WGK:** WGK-1.

**(EC) 1272/2008 Annex VI Table 3.1:**

Ingredient (s)	CAS No.	EC No. 1272/2008 Classification	
		CLASS. CODE	HAZARD CODE
Aluminum	7429-90-5	Pyr. Sol. 1	H250
		Water-react. 2	H261
Copper	7440-50-8	Aquatic Chronic 2	H411
Nickel	7440-02-0	Carc. 2	H351
		STOT RE 1	H372 **
		Skin Sens. 1	H317

**Chemical Safety Assessment:** A Chemical Safety Assessment has not been carried out.

**16. Other information**

**DISCLAIMER:**

All the information of this SDS is true and effective, and only for reference. Our company will not control the way how people use it, neither will we be responsible for any consequence. The users shall decide how to properly use the product or adopt certain production way for some special purpose. The above mentioned precautionary measures are helpful to avoid damage to the property or life safety during the operation or use of this product.

**References:**

GHS Annex II  
GHS SDS Instruction  
ANSI Z400.1/Z129.1-2010  
OSHA Hazard Communication Standard (HCS) 2012

**Full description of some acronyms:**

**CAS-Chemical Abstracts Service**  
**EINECS-European Inventory of Existing Commercial Chemical Substances**  
**IMO-International Maritime Organization**  
**IMDG-International Maritime Dangerous Goods**  
**IATA-International Air Transport Association**  
**ICAO-International Civil Aviation Organization**  
**TSCA-Toxic Substance Control Act**  
**OSHA-Occupational Safety and Health Administration**  
**ACGIH- American Conference of Governmental Industrial Hygienists**  
**ECHA- European Chemicals Agency**

**The Issuing date:** July 21, 2022

**SDS Version:** 1.0

\*\*\*\*\*The End\*\*\*\*\*