Safety Data Sheets

Name of Goods: Li-ion Battery

Commissioner: Shenzhen Huanyuyuan Technology Co., Ltd

GUANGDONG UTL CO., LTD.
# Safety Data Sheet (SDSs)

<table>
<thead>
<tr>
<th>Name of goods</th>
<th>Li-ion Battery</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type/Mode</td>
<td>18650 (11.1V 2200mAh)</td>
</tr>
<tr>
<td>Type</td>
<td>11.1V, 2200mAh, 24.42Wh</td>
</tr>
<tr>
<td>Commissioned by</td>
<td>Shenzhen Huanyuyuan Technology Co., Ltd</td>
</tr>
<tr>
<td>Commissioner address</td>
<td>Block 72C, Dongyuan Industrial Park, No.28 Beihuan Road West, Longteng Area, Shiyan town, Bao'nan District, Shenzhen, P.R. China</td>
</tr>
<tr>
<td>Manufacturer</td>
<td>Shenzhen Huanyuyuan Technology Co., Ltd</td>
</tr>
<tr>
<td>Manufacturer address</td>
<td>Block 72C, Dongyuan Industrial Park, No.28 Beihuan Road West, Longteng Area, Shiyan town, Bao'nan District, Shenzhen, P.R. China</td>
</tr>
<tr>
<td>Factory</td>
<td>Shenzhen Huanyuyuan Technology Co., Ltd</td>
</tr>
<tr>
<td>Factory address</td>
<td>Block 72C, Dongyuan Industrial Park, No.28 Beihuan Road West, Longteng Area, Shiyan town, Bao'nan District, Shenzhen, P.R. China</td>
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</tbody>
</table>
| Inspection according to | OSHA GHS: 《A Guide to The Globally Harmonized System of Classification and Labelling of Chemicals》
IATA DGR: 《Dangerous Goods Regulations》
IMO IMDG CODE: 《INTERNATIONAL MARITIME Dangerous Goods CODE》 |
| Receiving date: | 2018-08-08 |
| Date of issue: | 2018-08-14 |

Approved by: [Signature]
Reviewed by: [Signature]
Tested by: [Signature]
1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDEARTAKING

Product Identifier

Product name: Li-ion Battery
Model: 18650(11.1V 2200mAh)

Other means of identification

Synonyms:

Recommended use of the chemical and restrictions on use

Recommended Use:
Uses advised against:

a) Do not dismantle, open or shred secondary cells or batteries.
b) Do not expose cells or batteries to heat or fire. Avoid storage in direct sunlight.
c) Do not short-circuit a cell or battery. Do not store cells or batteries haphazardly in a box or drawer.
d) Do not remove a cell or battery from its original packaging until required for use.
e) Do not subject cells or batteries to mechanical shock.
f) In the event of a cell leaking, do not allow the liquid to come in contact with the skin or eyes. If contact has been made, wash the affected areas with copious amounts of water and seek medical advice.
g) Do not use any charger other than that specifically provided for use with the equipment.
h) Observe the plus(+) and minus(-) marks on the cell, battery and equipment and ensure correct use.
i) Do not use any cell or battery which is not designed for use with the equipment.
j) Do not mix cells of different manufacturer, capacity, size or type within a device.
k) Battery usage by children should be supervised.
l) Seek medical advice immediately if a cell or a battery has been swallowed.
m) Always purchase the battery recommended by the device manufacturer for the equipment.
n) Keep cells and batteries clean and dry.
o) Wipe the cell or battery terminals with a clean dry cloth if they become dirty.
p) Secondary cells and batteries need to be charged before use. Always use the correct charger and refer to the manufacturer’s instructions or equipment manual for proper charging instructions.
q) Do not leave a battery on prolonged charge when not in use.
r) After extended periods of storage, it may be necessary to charge and discharge the cells or batteries several times to obtain maximum performance.
s) Retain the original product literature for future reference.
t) Use only the cell or battery in the application for which it was intended.
u) When possible, remove the battery from the equipment when not in use.
v) Dispose of properly.

Details of the Manufacturer of the safety data sheet:

Name: Shenzhen Huanyuyuan Technology Co., Ltd
Address: Block 72C, Dongyuan Industrial Park, No.28 Beihuan Road West, Longteng Area, Shiyan town, Bao’an District, Shenzhen, P.R. China

GUANGDONG UTL CO., LTD.
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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.

Classification of the substance or mixture
Classification according to GHS

ACUTE TOXICITY-ORAL
Hazard category: 4
Signal world: Warning
Hazard statement: Harmful if swallowed

Pictogram:
Prevention: Wash thoroughly after handling. Do not eat, drink or smoke when using this product.
Response: Call a Poison center or doctor/physician if you feel unwel
Storage:
Disposal: Dispose of contents/container in accordance with local/national regulations

ACUTE TOXICITY-DERMAL
Hazard category: 3
Signal world: Danger.
Hazard statement: Toxic in contact with skin.

Pictogram:
Prevention: Wear protective gloves/protective clothing
Response: Call a Poison center or doctor/physician if you feel unwel
Storage: Store locked up.
Disposal: Dispose of contents/container in accordance with local/national regulations

SKIN CORROSION/IRRITATION
Hazard category: 1B
Signal world: Danger.
Hazard statement: Causes severe skin burns and eye damage.
Pictogram:
Prevention: Do not breathe dusts or mists. Wash thoroughly after handing. Wear protective gloves/protective clothing/eye protective/face.

Response: Wash thoroughly after handing. Call a Poison center or doctor/physician if you feel unwel.

Storage: Store locked up.

Disposal: Dispose of contents/container in accordance with local/national regulations.

**EYE DAMAGE/IRRITATION (CONTINUED)**

Hazard category: 2B

Signal world: Warning

Hazard statement: Causes eye irritation

Pictogram:

Prevention: Wash thoroughly after handing.

Response: If in eye: 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.

Storage:

Disposal:

**SENSITIZATION-RESPIRATORY**

Hazard category: 1A

Signal world: Danger

Hazard statement: May cause allergy or asthma symptoms or breathing difficulties if inhaled

Pictogram:


Response: If inhaled: If breathing is difficult, remove person to fresh air and keep comfortable for breathing. If experiencing respiratory symptoms: Call a poison center/doctor.

Storage:

Disposal: Dispose of contents/container in accordance with local/national regulations.

**SENSITIZATION-SKIN**

Hazard category: 1A

Signal world: Warning

Hazard statement: May cause an allergic skin reaction.

Pictogram:


Response: If on skin: Wash with plenty of water. If skin irritation or rash occurs: Get medical advice/attention. Wash contaminated clothing before reuse.

Storage:

Disposal: Dispose of contents/container in accordance with local/national regulations.

**EXPLOSIVES (CONTINUED)**

Hazard category: Division 1.1

Signal world: Danger
Hazard statement: Explosive; mass explosion hazard.

Pictogram:

Prevention: Keep away from heat/sparks/open flames/hot surfaces.-No smoking. Keep wetted.
Response: In case of fire: evacuate area. Explosion risk in case of fire. Do NOT fight fire reaches explosives.
Storage: Store in accordance with local/regional/national/international regulations.
Disposal: Dispose of contents/container in accordance with local/national regulations.

**FLAMMABLE SOLIDS**

Hazard category: 1

Signal word: Danger

Hazard statement: Flammable solid.

Pictogram:

Prevention: Keep away from heat/sparks/open flames/hot surfaces.-No smoking. Keep wetted.
Response: In case of fire: Use to extinguish.

Disposal:

### 3. COMPOSITION/INFORMATION ON INGREDIENTS

**Chemical characterixation: Mixtures**

**Description:**

Product: Consisting of the following components

<table>
<thead>
<tr>
<th>Common Chemical Name</th>
<th>Chemical Formula</th>
<th>Concentration (%)</th>
<th>CAS Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lithium Cobalt Dioxide</td>
<td>LiCoO₂</td>
<td>30-37</td>
<td>12190-79-3</td>
</tr>
<tr>
<td>Graphite</td>
<td>CH₄</td>
<td>15-20</td>
<td>7782-42-5</td>
</tr>
<tr>
<td>Carbon Black</td>
<td>C₅</td>
<td>0-1</td>
<td>1333-86-4</td>
</tr>
<tr>
<td>Polyvinylidene Fluoride Resin</td>
<td>CH₂-CF₂</td>
<td>0-1</td>
<td>24937-79-9</td>
</tr>
<tr>
<td>Phosphate(1-), Hexafluoro , Lithium</td>
<td>LiPF₆</td>
<td>12-16</td>
<td>21324-40-3</td>
</tr>
<tr>
<td>Polypolypeylene</td>
<td>(C₃H₆)n</td>
<td>6-10</td>
<td>9003-07-0</td>
</tr>
<tr>
<td>Aluminium (Al)</td>
<td>AlH₃</td>
<td>2-5</td>
<td>7429-90-5</td>
</tr>
<tr>
<td>Copper (Cu)</td>
<td>Cu</td>
<td>5-10</td>
<td>7440-50-8</td>
</tr>
<tr>
<td>Iron (Fe)</td>
<td>Fe</td>
<td>10-15</td>
<td>7439-89-6</td>
</tr>
</tbody>
</table>

Note: CAS number is Chemical Abstract Service Registry Number.
N/A=Not apply.

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4. FIRST-AID MEASURES

First aid measures
Eye Contact   Rinse thoroughly with plenty of water, also under the eyelids. If symptoms persist, call a physician.
Skin Contact   Remove contaminated clothing and shoes. Wash skin with soap and water. In the case of skin irritation or allergic reactions see a physician.
Inhalation    Move to fresh air. If symptoms persist, call a physician.
Ingestion     Do NOT induce vomiting. Drink plenty of water. If symptoms persist, call a physician.

Most important symptoms and effects, both acute and delayed
Swallowing    Do not induce vomiting. Get medical attention.

Most Important Symptoms/Effects    No information available.
Indication of any immediate medical attention and special treatment needed
Notes to Physician Test symptomatically

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media
CO2, dry chemical powder, water spray.

Unsuitable Extinguishing Media: No information available.

Specific Hazards Arising from the Chemical
Formation of toxic gases is possible during heating or case of fire.
In case of fire, the following can be released:
Carbon monoxide (Co)
Carbon dioxide
Other irritating and toxic gases.

Hazardous Combustion Products
Carbon oxides.

Explosion Date
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. For example: Wear self-contained respiratory protective device.
Wear suitable protective clothing and eye/face protection.

Special hazards arising from the substance or mixture:
Battery may burst and release hazardous decomposition products when exposed to a fire situation.
Lithium ion batteries contain flammable electrolyte that may vent, ignite and produce sparks when subjected to high temperature (>150°C). When damaged or abused (e.g. mechanical damage or electrical overcharging ); may burn rapidly with flare-burning effect; may ignite other batteries in clothes proximity.
6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal Precautions
Avoid contact with eyes. Refer to section 8 for personal protective equipment. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas.

Environmental Precautions
Environmental Precautions Refer to protective measures listed in Sections 7 and 8. Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust). Dispose contaminated material as waste according to item 13.

Methods and material for containment and cleaning up

Methods for Containment
Prevent further leakage or spillage if safe to do so.

Methods for Cleaning up
Use personal protective equipment. Dam up. Cover liquid spill with sand, earth or other Non combustible absorbent material. Pick up and transfer to properly labelled containers. Clean contaminated surface thoroughly.

7. HANDLING AND STORAGE

Precautions for safe handling

Handling Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin, eyes and clothing. Wear personal protective equipment. Wash thoroughly after handling. Use this material with adequate ventilation. The Product is not explosive.

Conditions for safe storage, including any incompatibilities

If the Li-ion Battery is subject to storage for such a long term as more than 3 months, it is recommended to recharge the Lithium-ion Polymer Battery Periodically.
3 months: -10°C~ +40°C, 45 to 85% RH
And recommended at 0°C~+35°C for long period storage.
The capacity recovery rate in the delivery state (50% capacity of fully charged) after storage is assumed to be 80% or more.
The voltage for a long time storage shall be 3.7V~4.2V range.
Do not storage Lithium-ion Battery haphazardly in a box or drawer where they may short-circuit each other or be short-circuited by other metal objects.
Keep out of reach of children.
Do not expose Lithium-ion Polymer Battery to heat or fire. Avoid storage in direct sunlight.
Do not store together with oxidizing and acidic materials.
Keep ignition sources away- Do not smoke.
Store in cool, dry and well-ventilated place.

**Incompatible Products** None known.

## 8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

### Control parameters

<table>
<thead>
<tr>
<th>Ingredients with limit values that require monitoring at the workplace:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>12190-79-3 Lithium Cobalt Dioxide</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>TLV(USA)</th>
<th>0.02mg/m³</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAK(Germany)</td>
<td>0.1mg/m³</td>
</tr>
</tbody>
</table>

**Other Exposure Guidelines** Vacated limits revoked by the Court of Appeals decision in AFL-CIO v.
OSHA, 965 F.2d 962 (11th Cir., 1992).

**Appropriate engineering controls**

**Engineering Measures**
- Showers
- Eyewash stations
- Ventilation systems

Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible
Exposure limits. Ensure or adequate ventilation.

**Individual protection measures, such as personal protective equipment**

**Eye/Face Protection:**
- Tightly sealed goggles

**Body protection:**
Protective work clothing.

**Skin protection:**
- Protective gloves

**Material of gloves:**
The selection of the suitable gloves does not noly depend on the material, but also on further marks of quality
and varies from manufacturer to manufacturer. As the product is preparation of several substances, the
resistance of the glove material can not to be calculated in advance and has therefore to be checked prior to
the application.

**Penetration time of glove material:**
The exact breakthrough time has to be found out by manufacturer of the Protective gloves and has to be observed.

**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.

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### 9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Physician State</th>
<th>Form: Trilateral</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Color: Blue</td>
</tr>
<tr>
<td></td>
<td>Odour: Odourless</td>
</tr>
<tr>
<td></td>
<td>Odor Threshold: No information available</td>
</tr>
</tbody>
</table>

**Change in condition:**

- pH, with indication of the concentration: 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: Not determined.
- Vapor Pressure: Not determined.
- Vapor Density: Not determined.
- relative density: Not determined.
- Solubility in Water: Not determined.
- Solubility in other solvents: Not determined.
- n-octanol/water partition coefficient: Not determined.
- Auto-ignition temperature: Product is not self-igniting.
- Decomposition temperature: Not determined.
- Odout threshold: Not determined.
- Evaporation rate: Not determined.
- Viscosity: Not determined.
- Other Information: No further relevant information available.

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### 10. STABILITY AND REACTIVITY

**Reactivity:** Stable under recommended storage and handling conditions (see section 7, Handling and storage)

**Chemical stability:** Stable Under normal conditions of use, storage and transport.

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Thermal decomposition/conditions to be avoided: No decomposition if used according to specifications.

Possibility of Hazardous Reactions: None under normal processing.

Hazardous Polymerization: Hazardous polymerization does not occur.

Conditions to avoid: Strong heating, fire, Incompatible materials.


Hazardous Decomposition Products: Carbon oxides, Other irritating and toxic gases.

11. TOXICOLOGICAL INFORMATION

Acute toxicity: No data available.

LD/LC50 values relevant for classification:
Not available.

Skin corrosion/irritation: No irritant effect.

Serious eye damage/irritation: Cause serious eye irritation.

Respiratory or skin sensitization: No sensitizing effects known.

Specific target organ system toxicity: No information available.

CMR effects (carcinogenicity, mutagenicity and toxicity for reproduction): No information available.

12. Ecological information

Toxicity:

Acquatic toxicity:
No further relevant information available.

Persistence and degradability: No further relevant information available.

Bioaccumulation potential: No further relevant information available.

Mobility in soil: No further relevant information available.

Results of PBT and vPvB assessment
PBT: Not applicable.
vPvB: Not applicable.

Other adverse effects: No information available.

13. DISPOSAL CONSIDERATIONS

Waste treatment methods

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14. TRANSPORT INFORMATION

**Land transport**
ADR/RID class: Not regulated.
UN-Number: UN3480 or UN3481.

**Maritime transport**
IMDG Class: Class 9.
UN Number: UN3480 or UN3481.
Marine pollutant: No

**Air transport**
ICAO/IATA Class: Class 9
UN/ID Number: UN3480 or UN3481.
Environmental hazards: Not applicable.
Special precautions for user: Not applicable.
Transport/Additional information: Not restricted goods according to the above specifications.
The Lithium-ion Battery bad been tested according to the requirements of the UN manual of tests and Criteria, Part III, subsection 38.3;
The Lithium ion batteries according to Section II/Section IB of PACKING INSTRUCTION 965, or Section II of PACKING INSTRUCTION 966~967 of the Dangerous Goods regulations 59th Edition may be transported.
The packaging shall be adequate to avoid mechanical damage during transport, handling and stacking.
The materials and pack design shall be chosen so as to prevent the development of unintentional electrical conduction, corrosion of the terminals and ingress of moisture.
Meets requirements of DOT Special Provision 188 to be transported as non-dangerous goods
Meets the requirements of 49CFR173.185 to be transported as non-dangerous goods for road, rail, air, and vessel (Effective August 6, 2014 per HM224F)
The package must be handled with care and that a flammability hazard exists if the package is damaged;

15. REGULATORY INFORMATION

**Safety, health and environmental regulations/legislation specific for the substance or mixture**
EU Regulation:

**Authorisations**: No information available.

**Restrictions on use**: No information available.
### Regulatory information

<table>
<thead>
<tr>
<th>CAS NO.</th>
<th>EU (EINECS)</th>
<th>US (TSCA)</th>
<th>Japan (ENCS)</th>
<th>Canada (DSL/NDSL)</th>
<th>Australia (AICS)</th>
<th>Korea (ECL)</th>
<th>China (IECSC)</th>
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</table>

**Chemical safety assessment** A Chemical Safety Assessment has not been carried out

### 16. OTHER INFORMATION

This information is based on out present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

**Relevant Phrases:**

- R20/22: Harmful by inhalation and if swallowed.
- R36: Irritating to eyes.
- H302: Harmful if swallowed.
- H332: Harmful if inhaled.
Photos

Fig.1 General view 1 of battery

Fig.2 General view 2 of battery