

SDS

SAFETY DATA SHEET

Prepared For : KML TECHNOLOGY CO., LTD.
Huainan Industrial Zone, Chenghai, Shantou, Guangdong, China

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Approved by: 



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Section 1-Chemical Product and Company Identification

Product: Li-polymer Battery

Common name: Li-polymer Battery

Model: 153380

Rating of battery: 7.4V, 1500mAh, 11.1Wh **Weight:** 72.0g

Manufacture: KML Technology CO., LTD.

Address: Huainan Industrial Zone, Chenghai, Shantou, Guangdong, China

Post Code: 515834

Fax No: 0754-85136996

Emergency Telephone: 0754-85138996

Section 2 - Hazards Identification

(a) Classification

This chemical is 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 1 |
| Carcinogenicity | Category 2 |
| Specific target organ toxicity (repeated exposure) | Category 1 |

(b) GHS Label elements, including precautionary statements

Emergency Overview

| | |
|--|---------------|
| Signal word | Danger |
| Hazard Statements | |
| Causes skin irritation | |
| Causes serious eye damage | |
| Suspected of causing cancer | |
| Causes damage to organs through prolonged or repeated exposure | |



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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

Wash face, hands and any exposed skin thoroughly after handling.

Wear protective gloves/protective clothing/eye protection/face protection

Do not breathe dust/fume/gas/mist/vapors/spray

Do not eat, drink or smoke when using this product

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. Immediately call a POISON CENTER or doctor/physician

Skin

IF ON SKIN: Wash with plenty of soap and water

If skin irritation occurs: Get medical advice/attention

Take off contaminated clothing and wash before reuse

Precautionary Statements - Storage

No information available.

Precautionary Statements - Disposal

Dispose of contents/container to an approved waste disposal plant

(c) Hazards not otherwise classified (HNOC)



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No information available.

(d) Unknown Toxicity

No information available.

(e) Other information

No information available.

(f) Interactions with Other Chemicals

No information available.

Section 3 - Composition/Information on Ingredient

| Chemical Name | Molecular formula | CAS No. | Weight (%) |
|-----------------------------|--|------------|------------|
| Lithium cobalt oxide | LiCoO ₂ | 12190-79-3 | 32.5 |
| PVDF | (C ₂ H ₂ F ₂) _n | 24937-79-9 | 2.2 |
| Carbon black | C | 1333-86-4 | 16.6 |
| polyethylene | (C ₂ H ₄) _n | 9002-88-4 | 2.1 |
| Copper | Cu | 7440-50-8 | 10.6 |
| Aluminum | Al | 7429-90-5 | 21.8 |
| Diethyl carbonate | C ₅ H ₁₀ O ₃ | 105-58-8 | 6.35 |
| Ethylene carbonate | C ₃ H ₄ O ₃ | 96-49-1 | 4.97 |
| Lithium hexafluorophosphate | F ₆ LiP | 21324-40-3 | 2.18 |
| Nickel | Ni | 7440-02-0 | 0.7 |

Section 4 - First Aid Measures

The battery is not hazard with eye and skin contact under normal circumstance. In case of the enclosure is damaged, the battery can not be used and touched. It is safety except that the battery is damaged by fire or rupture. The leakage of internal hazardous substance and formation of hazardous substance would occur, take the following measures if contact with the battery.

Skin touch: If there is any unwell reaction, wash thoroughly with soap & water, flush with plenty of water. If irritation persists, seek medical advice.



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Eyes touch: Rinse immediately with plenty of water for at least 15 mins. Contact a doctor if symptoms persist.

Inhalation: Remove from exposure site to fresh air. Keep at rest. Obtain medical attention.

Ingestion: Rinse mouth out with water. Seek medical advice immediately.

Self-protection of the first aider: Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves and prevent spread of contamination.

Information for doctor

Most important symptoms and effects, both acute and delayed: Coughing and/ or wheezing. Itching.

Indication of any immediate medical attention and special treatment needed: Treat symptomatically.

Section 5 - Fire Fighting Measures

(a) Extinguishing media

Suitable extinguishing media: Use foam, dry powder or dry sand, CO₂ as appropriate.

Unsuitable extinguishing media: No information available.

(b) Special hazards arising from the chemical

Under fire conditions, batteries may burst and release hazardous decomposition products when exposed to a fire situation. This could result in the release of flammable or corrosive materials. Hazardous combustion products: CO, CO₂, Metal oxides, Irritating fumes.

(c) Special protective equipment and precautions for fire-fighters

Firefighters must wear fire resistant protective equipment and appropriate breathing apparatus. The staff must equip with filter mask (full mask) or isolated breathing apparatus. The staff must wear the clothes which can defense the fire and the toxic gas. Put out the fire in the upwind direction. Remove the container to the open space as soon as possible. Spray water on the containers in the fireplace to keep them cool until finish extinguishment.

Section 6 - Accidental Release Measures

Personal precautions, protective equipment and emergency procedures:

If the battery is released, remove personnel from area until fumes dissipate. Provide maximum ventilation to clear out hazardous gases. The preferred response is to leave the area and allow the vapors to dissipate. Avoid skin and eyes contact or inhalation of vapors. Remove spilled liquid with absorbent and incinerated. If leakage



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of the battery happens, liquid could be absorbed with sand, earth or other inert substance and contaminated area should be ventilated meantime.

Environment precautions:

- Do not allow product to reach sewage system or any water source.
- Inform respective authorities in case of seepage into water course or sewage system.
- Do not allow to enter sewers/ surface or ground water.

Methods and material for containment and cleaning up:

If battery casing is dismantled, small amounts of electrolyte may leak. Collect all released material in a plastic lined container. Dispose of according to the local law and rules. Avoid leached substances to get into the earth, canalization or waters.

Section 7 - Handling and Storage

Precautions for safe handling:

Always follow the warning information on the batteries and in the manuals of devices. Only use the recommended battery types. Keep batteries away from children. For devices to be used by children, the battery casing should be protected against unauthorized access. Unpacked batteries shall not lie about in bulk. In case of battery change always replace all batteries by new ones of identical type and brand. Do not swallow batteries. Do not throw batteries into water. Do not throw batteries into fire. Avoid deep discharge. Do not short-circuit batteries. Use recommended charging time and current.

Storage conditions:

If the batteries are subject to storage for such a long term as more than 3 months, it is recommended to recharge the Li-ion battery periodically.

Storage Temperature:

Short period less than 3 months: -20~+45°C, 75%RH Max

Long period more than 3 months: +5°C~+35°C, 75%RH Max

Do not store Li-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 Li-ion battery to heat or fire. Avoid storage in direct sunlight. Do not store together with oxidizing and acidic materials.

Section 8 - Exposure Controls, Personal Protection



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(a) Control parameters

(b) Exposure Guidelines

| Chemical Name | ACGIH TLV | OSHA PEL | NIOSH IDLH |
|---|--|---|---|
| Lithium Cobalt Oxide (LiCoO ₂) 12190-79-3 | TWA: 0.02 mg/m ³ | - | |
| Aluminum 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 |
| Phosphate(1-),hexafluoro-, lithium 21324-40-3 | TWA: 2.5 mg/m ³ F | TWA: 2.5 mg/m ³ F TWA: 2.5 mg/m ³ dust (vacated) TWA: 2.5 mg/m ³ | |
| Copper 7440-50-8 | TWA: 0.2 mg/m ³ fume TWA: 1mg/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 |
| 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 |
| 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 | IDLH: 1250 mg/m ³ TWA: 2.5 mg/m ³ respirable dust |



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| | | | |
|--|--|--|--|
| | | total dust synthetic (vacated) TWA: 5 mg/m3 respirable fraction synthetic TWA: 15 mppcf natural | |
|--|--|--|--|

ACGIH TLV: American Conference of Governmental Industrial Hygienists -Threshold Limit Value OSHA PEL: Occupational Safety and Health Administration - Permissible Exposure Limits 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)

(b) Appropriate engineering controls

Engineering Measures: 1. Showers 2. Eyewash stations 3. Ventilation systems

(c) Individual protection measures, such as personal protective equipment

Respiratory protection: No necessary under normal use. In case electrolyte leakage from the battery, protect hand with chemical resistant rubber gloves. If battery is burning, leave the area immediately. In abuse, use NIOSH approved acid gas filter mask or self-contained breathing apparatus.

Hand protection: None under normal use. In case of spilling, use PVC, neoprene or nitrile gloves of 15mils (0.015 inch) or thicker.

Eye/Face protection: None required under normal conditions. Use approved chemical work safety goggles or face shield, if handling a leaking or rupture battery.

Skin and body protection: No necessary under normal use. Use rubber apron and protective working in case of handling of a rupture battery.

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

Section 9- Physical and Chemical Properties

Information on basic physical and chemical properties

General information



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| | | | |
|---|---------------------|-------------------------|---------------------------------------|
| Form: Solid | Colour: Blue | Odour: Odourless | Odour threshold: Not available |
| pH-value: Not available | | | |
| Change in condition | | | |
| Melting point/Melting range: Not available | | | |
| Boiling point/Boiling range: Not available | | | |
| Freezing point: Not available | | | |
| Flash point: Not available | | | |
| Flammability (solid, gaseous): Not available | | | |
| Auto-ignition temperature: Not available | | | |
| Decomposition temperature: Not available | | | |
| Self-igniting: Product is not self igniting. | | | |
| Explosive properties: Risk of explosion by shock, friction, fire or other sources of ignition. | | | |
| Explosion limits | | | |
| Lower: Not available | | | |
| Upper: Not available | | | |
| Oxidizing properties: Not available | | | |
| Vapour pressure: Not available | | | |
| Density: Not available | | | |
| Relative density: Not available | | | |
| Vapour density: Not available | | | |
| Evaporation rate: Not available | | | |
| Solubility in / Miscibility with water: Not available | | | |
| Partition coefficient (n-octanol/water): Not available. | | | |
| Viscosity | | | |
| Dynamic: Not available. | | | |
| Kinematic: Not available | | | |
| Other information: No further relevant information available. | | | |
| Section 10- Stability and reactivity | | | |



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(a) Reactivity

Stable under recommended storage and handling conditions.

(b) Chemical stability

Stable under normal conditions.

(c) Possibility of hazardous reactions

When heated above 150°C the risk of rupture occurs. Due to special safety construction, rupture implies controlled release of pressure without ignition.

(d) Conditions to avoid

Do not subject Li-ion Battery to mechanical shock. Keep away from open flames, high temperature.

(e) Incompatible materials

Strong oxidizer, strong acid, strong bases

(f) Hazardous decomposition products

Under fire conditions, the electrode materials can form carcinogenic nickel and cobalt oxides.

Section 11- Toxicological information

(a) Information on the likely routes of exposure

Inhalation: Inhalation of a large number of vapors or fumes released due to heat may cause respiratory.

Ingestion: Ingestion of battery contents may cause mouth, throat and intestinal burns and damage.

Skin contact: Contact with battery electrolyte may cause burns and skin irritation.

Eye contact: Contact with battery electrolyte may cause burns. Eye damage is possible.

Under normal conditions (during charge and discharge) release of ingredients does not occur. If accidental release occurs see information in section 4. Swallowing of a battery can be harmful. Call the local Poison Control Centre for advice and follow-up.

Component Information

| Chemical name | Oral LD50 | Dermal LD50 | Inhalation LC50 |
|------------------------------|-----------------------|-----------------------|-----------------|
| Propylene carbonate 108-32-7 | = 29000 mg/kg (Rat) | > 20 mL/kg (Rabbit) | -- |
| Carbon black 1333-86-4 | > 15400 mg/kg (Rat) | > 3 g/kg (Rabbit) | -- |



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| | | | | |
|--------------------|---------|---------------------|----|----|
| Ethylene carbonate | 96-49-1 | 10000 mg/kg (Rat) | -- | -- |
|--------------------|---------|---------------------|----|----|

(b) Information on toxicological effects

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

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

Sensitization: No information available.

Mutagenic Effects: No information available.

Carcinogenicity: Cobalt and Cobalt compounds are considered to be possible human carcinogen(s).

Reproductive Toxicity: No data available.

STOT-Single Exposure: No data 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 CFR 1910.1200), this product has been determined to cause systemic target organ toxicity from chronic or repeated exposure. (STOT RE).

Chronic Toxicity: Contains a known or suspected carcinogen. Avoid repeated exposure. Prolonged exposure may cause chronic effects. Carbon black has been classified by the International Agency for Research on Cancer (IARC) as possibly carcinogenic to humans (Group 2B) by inhalation.

Target organ effects: Respiratory system. Eyes. Skin. Gastrointestinal tract (GI).

Aspiration Hazard: No data available.

Section 12- Ecological Information

Toxicity

- Aquatic toxicity: No further relevant information available.
- Persistence and degradability: No further relevant information available.
- Behaviour in environmental systems: No further relevant information available.
- Bioaccumulative potential: No further relevant information available.
- Mobility in soil: No further relevant information available.

· **Additional ecological information**



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· General notes:

Water hazard class 2 (German Regulation) (Self-assessment): hazardous for water

Do not allow product to reach ground water, water course or sewage system.

Danger to drinking water if even small quantities leak into the ground.

· Results of PBT and vPvB assessment

· **PBT:** Not applicable.

· **vPvB:** Not applicable.

· **Other adverse effects:** No further relevant information available.

Section 13- Disposal Considerations

Nature of waste: Hazardous Waste

Waste disposal methods:

- a. Disposal of the battery should be performed by permitted, professional disposal firms knowledgeable in federal, state or local requirements of hazardous waste treatment and hazardous waste transportation.
- b. Incineration should never be performed by battery used. The batteries contained recyclable materials. Recycling options available in your local area should be considered when disposing of this product, through licensed waste carrier.
- c. The battery should have their terminal insulated in order to prevent short circuits during transportation to the disposal site.

Note: Consult your local or region authorities, disposal maybe subject to national, state, or local laws.

Section 14 – Transport Information

According to **PACKING INSTRUCTION 965 ~ 967 of IATA DGR 57th Edition** for transportation, the special provision 188 of IMDG (inc Amdt 37-14). The batteries should be securely packed and protected against short-circuits. Examine whether the package of the containers are integrate and tighten closed before transport. Take in a cargo of them without falling, dropping, and breakage. Prevent collapse of cargo piles. Don't put the goods together with oxidizer and chief food chemicals. The transport vehicle and ship must be cleaned and sterilized otherwise it is not allowed to assemble articles. During transport, the vehicle should prevent exposure, rain and high temperature. For stopovers, the vehicle should be away from fire and heat sources. When



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transported by sea, the assemble place should keep away from bedroom and kitchen, and isolated from the engine room, power and fire source. Under the condition of Road Transportation, the driver should drive in accordance with regulated route, don't stop over in the residential area and congested area. Forbid to use wooden, cement for bulk transport.

UN-Number

· ADR, IMDG, IATA UN3480 or UN3481

UN proper shipping name

· ADR LITHIUM ION BATTERIES

· IMDG, IATA LITHIUM ION BATTERIES

Transport hazard class(es)

· ADR, IMDG, IATA 9

Packing group

ADR, IMDG, IATA N/A

Marine pollutant: No

Special precautions for user: Warning: Miscellaneous dangerous substances and articles.

Danger code (Kemler): Not applicable.

Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code: Not applicable.

UN "Model Regulation": UN3480 or UN3481, LITHIUM ION BATTERIES, 9

Section 15- Regulatory information

OSHA hazard communication standard (29 CFR 1910.1200)

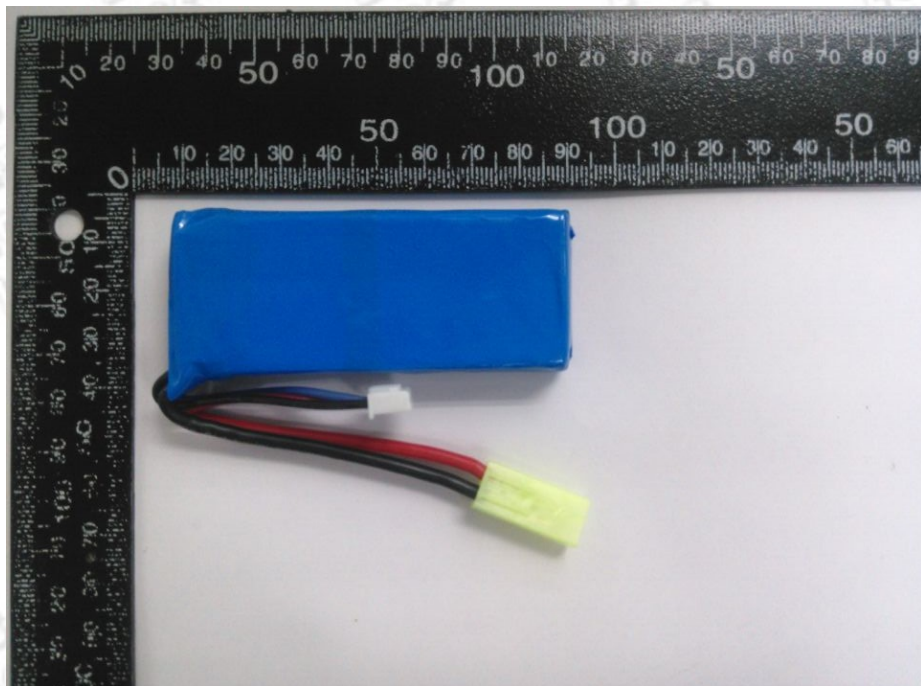
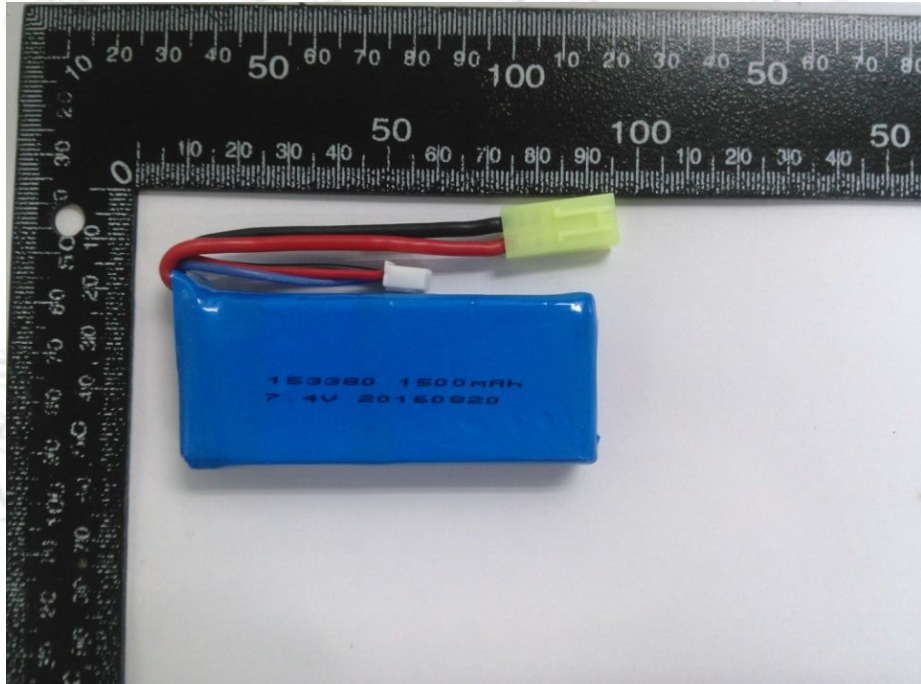
_____ Hazardous Non-hazardous

Section 16- Other Information

Note: The above information is based on the data of which we are aware and is believed to be correct as of the data hereof. Since this information may be applied under conditions beyond our control and with which may be unfamiliar and since data made available subsequent to the data hereof may suggest modifications of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.



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