# SAFETY DATA SHEET

## 1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

Product identifier		
Product Name Other means of identification	Lithium ion Cell	
Synonyms	None	
Recommended use of the chemica	al and restrictions on use	
Recommended Use	LITHIUM ION BATTERIES	
Uses advised against	No information available	
Details of the supplier of the safety data sheet		
Supplier Name Supplier Address	JiangSu Tenpower Lithium Co.,Ltd. Nangang Rd,Emerging industries Zone,Jinfeng Town, Zhangjiagang City,Jiangsu, 215636 China	
Supplier Phone Number	Phone:+860512-80159851 Fax: +860512-80159851 Contact Phone+860512-80159851	
Supplier Email Emergency telephone number	haiyan.ai@tenpower.cc	

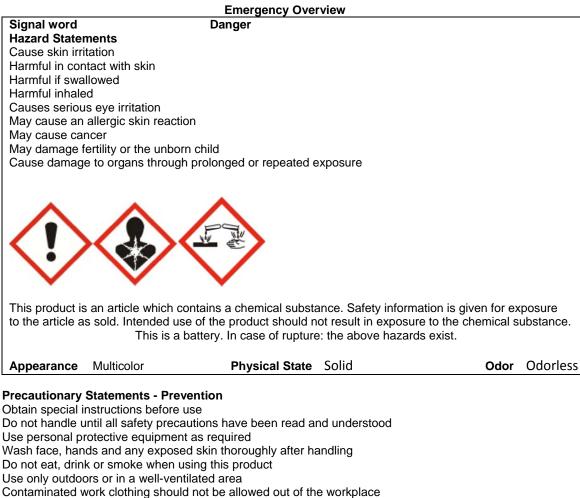
## 2. HAZARDS IDENTIFICATION

#### **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.

Skin corrosion/irritation	Category 2
Serious eye damage/eye irritation	Category 2
Skin sensitization	Category 1
Carcinogenicity	Category 1A
Specific target organ toxicity (repeated exposure)	Category 1
Acute toxicity(Oral)	Category 4
Acute Inhalation(Gases)	Category 4
Acute Inhalation(Dusts/Mists)	Category 4
Reproductive Toxicity	Category 1B

#### GHS Label elements, including precautionary statements



Wear protective gloves

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

Wear eye/face protection

#### **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 If eye irritation persists: Get medical advice/attention

#### Skin

IF ON SKIN: Wash with plenty of soap and water Take off contaminated clothing and wash before reuse If skin irritation or rash occurs: Get medical advice/attention

#### **Precautionary Statements - Storage**

Store locked up

#### Precautionary Statements - Disposal

Dispose of contents/container to an approved waste disposal plant

#### Hazards not otherwise classified (HNOC) Not applicable

Unknown Toxicity

## Other information

Very toxic to aquatic life with long lasting effects

Repeated or prolonged skin contact may cause allergic reactions with susceptible persons

### Interactions with Other Chemicals

No information available

## **3. COMPOSITION/INFORMATION ON INGREDIENTS**

Chemical Name	CAS No.	Weight %	
Lithium Cobalt Oxide	12190-79-3	37.9	
Cobalt(II) oxide	1307-96-6	7.4	
Manganese dioxide	1313-13-9	15.4	
Nickel oxide	1313-99-1	3.3	
Carbon	7440-44-0	13	
Polyvinylidene Fluoride (PVDF)	24937-79-9	1.6	
Copper	7440-50-8	8	
Aluminum	7429-90-5	10	
Ethylene carbonate	96-49-1	1.2	
Diethyl carbonate	105-58-8	1.1	
Dimethyl carbonate	616-38-6	1.1	

4. FIRST AID MEASURES		
<u>First aid measures</u> General Advice	First aid is upon rupture of sealed battery. Show this safety data sheet to the doctor in attendance	
Eye Contact	Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Keep eye wide open while rinsing. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention if irritation develops and persists. Do not rub affected area	
Skin Contact	Wash off immediately with soap and plenty of water for at least 15 minutes. In the case of skin irritation or allergic reactions see a physician. May cause an allergic skin reaction.	
Inhalation	Remove to fresh air. If symptoms persist, call a physician. Get medical attention immediately if symptoms occur.	
Ingestion	Do NOT induce vomiting. Rinse mouth immediately and drink plenty of water. Never give anything by mouth to an unconscious person. Call a physician.	
Self-protection of the first aider	Avoid contact with skin, eyes or clothing. Use personal protective equipment as required. Wear personal protective clothing (see section 8)	
Most important symptoms and effects, both acute and delayed		
Most Important Symptoms and Effects	Burning sensation. Coughing and/ or wheezing. Difficulty in breathing. Itching. Rashes. Hives.	
Indication of any immediate medical attention and special treatment needed		

## **Notes to Physician** May cause sensitization of susceptible persons. Treat symptomatically

## **5. FIRE-FIGHTING MEASURES**

#### Suitable Extinguishing Media

Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

#### **Unsuitable Extinguishing Media**

CAUTION: Use of water spray when fighting fire may be inefficient

## Specific Hazards Arising from the Chemical

Product is or contains a sensitizer. May cause sensitization by skin contact.

#### **Hazardous Combustion Products**

Carbon Oxides

#### Explosion Data Sensitivity to Mechanical Impact Sensitivity to Static Discharge

No.

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.

## 6. ACCIDENTAL RELEASE MEASURES

#### Personal precautions, protective equipment and emergency procedures

Personal Precautions	Avoid contact with skin, eyes or clothing. Ensure adequate ventilation.Use personal. protective equipment as required. Evacuate personnel to safe areas.
Other Information	Refer to protective measures listed in Sections 7 and 8
Environmental Precautions Environmental Precautions	Refer to protective measures listed in Sections 7 and 8.
Methods for cleaning up	Pick up and transfer to properly labeled containers
Methods for Containment	Prevent further leakage or spillage if safe to do so.
Methods for cleaning up	Pick up and transfer to properly labeled containers.

## 7. HANDLING AND STORAGE

#### Precautions for safe handling

Handling	In case of rupture. Use personal protection equipment. Avoid contact with skin, eyes or clothing.	
Conditions for safe storage, including any incompatibilities		
Storage	Keep containers tightly closed in a dry, cool and well-ventilated place.	
Incompatible Products	Strong acids. Strong oxidizing agents. Strong bases.	

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

#### <u>Control parameters</u> Exposure Guidelines

Chemical NameACGIH TLVOSHA PELNIOSH IDLHLithium Cobalt OxideTWA: 0.02 mg/m³Image: Cobalt(II) oxideTWA: 0.02 mg/m³ Co12190-79-3TWA: 0.02 mg/m³ CoImage: Cobalt(II) oxideTWA: 0.02 mg/m³ Co1307-96-6Image: Cobalt OxideImage: Cobalt OxideImage: Cobalt Oxide

Manganese dioxide 1313-13-9	TWA: 0.02 mg/m <sup>3</sup> Mn TWA: 0.1 mg/m <sup>3</sup> Mn	(vacated) Ceiling: 5 mg/m <sup>3</sup> Ceiling: 5 mg/m <sup>3</sup> Mn	IDLH: 500 mg/m <sup>3</sup> Mn TWA: 1 mg/m <sup>3</sup> Mn STEL: 3 mg/m <sup>3</sup> Mn
Nickel oxide 1313-99-1	TWA: 1.5 mg/m <sup>3</sup>	TWA: 1 mg/m <sup>3</sup> (vacated) TWA: 1 mg/m <sup>3</sup>	IDLH: 10 mg/m <sup>3</sup> TWA: 0.015 mg/m <sup>3</sup>
Copper 7440-50-8	TWA: 0.2 mg/m <sup>3</sup> fume TWA: 1 mg/ mg/m <sup>3</sup> Cu dust and mist	TWA: 0.1 mg/m <sup>3</sup> fume TWA: 1 mg/m <sup>3</sup> dust and mist (vacated) TWA: 0.1 mg/m <sup>3</sup> Cu dust, fume, mist	IDLH: 100 mg/m <sup>3</sup> dust, fume and mist TWA: 1 mg/m <sup>3</sup> dust and mist TWA: 0.1 mg/m <sup>3</sup> fume
Aluminum 7429-90-5	TWA: 1 mg/m <sup>3</sup> respirable fraction	TWA: 15 mg/m <sup>3</sup> total dust TWA: 5 mg/m <sup>3</sup> respirable fraction (vacated) TWA: 15 mg/m <sup>3</sup> total dust (vacated) TWA: 5 mg/m <sup>3</sup> respirable fraction (vacated) TWA: 5 mg/m <sup>3</sup> Al Aluminum	TWA: 10 mg/m <sup>3</sup> ₃ total dust TWA: 5 mg/m <sup>3</sup> respirable dust

ACGIH TLV: American Conference of Governmental Industrial Hygienists - Threshold Limit Value OSHA PEL: Occupational Safety and Health Administration - Permissible Exposure Limits NIOSH IDLH 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) See section 15 for national exposure control parameters	
Appropriate engineering contro Engineering Measures	<u>Is</u> Showers Eyewash stations Ventilation systems	
Individual protection measures, such as personal protective equipment		
Eye/Face Protection	If splashes are likely to occur:. Wear safety glasses with side shields (or goggles). None required for consumer use.	
Skin and Body Protection	Wear protective gloves and protective clothing. Long sleeved clothing. Impervious gloves	
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. Do not eat, drink or smoke when using this product. Take off contaminated clothing and wash before reuse.Avoid contact with skin, eyes or clothing. Wear suitable gloves and eye/face protection. Wash hands before breaks and immediately after handling the product.	

## 9. PHYSICAL AND CHEMICAL PROPERTIES

## **Physical and Chemical Properties**

<b>Physical State</b>	e Solid
Appearance	Multicolor
Color	No information available

Odor Odor Threshold

Odorless No information available

Property pH Melting / freezing point Boiling point / boiling range
Flash Point
Evaporation Rate
Flammability (solid, gas)
Flammability Limit in Air
Upper flammability limit
Lower flammability limit
Vapor pressure
Vapor density
Specific Gravity
Water Solubility
Solubility in other solvents
Partition coefficient: n-octanol/water
Autoignition temperature
Decomposition temperature
Kinematic viscosity
Dynamic viscosity
Explosive properties
Oxidizing Properties

No data available 0.00001 No data available No data available No data available 0.00001 No data available No data available

Values

## Remarks/ Method None known None known

None known

None known

None known

**Other Information** 

#### Softening Point VOC Content (%) Particle Size Particle Size Distribution

No data available No data available No data available

## **10. STABILITY AND REACTIVITY**

#### Reactivity

No data available

#### Chemical stability

Stable under recommended storage conditions.

#### Possibility of Hazardous Reactions

None under normal processing.

#### **Hazardous Polymerization**

Hazardous polymerization does not occur.

#### Conditions to avoid

None known based on information supplied.

#### **Incompatible materials**

Strong acids. Strong oxidizing agents. Strong bases.

#### **Hazardous Decomposition Products**

## **11. TOXICOLOGICAL INFORMATION**

#### Information on likely routes of exposure

Product Information	Product does not present an acute toxicity hazard based on known or supplied information In case of rupture
Inhalation	Specific test data for the substance or mixture is not available. Corrosive by inhalation.(based on components).

Eye Contact	Specific test data for the substance or mixture is not available. Expected to be and irritant based on components. Irritating to eyes. May cause redness, itching, and pain. May cause temporary eye irritation.
Skin Contact	Specific test data for the substance or mixture is not available. Expected to be an irritant based on components. Irritating to skin. Prolonged contact may cause redness and irritation.
Ingestion	Specific test data for the substance or mixture is not available. Ingestion may cause irritation to mucous membranes. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea. May be harmful if swallowed. (based on components).

#### **Component Information**

Chemical Name	Oral LD50	Dermal LD50	Inhalation LC50
Nickel oxide 1313-99-1	> 9000 mg/kg(Rat)	-	-
Manganese dioxide 1313-13-9	= 9000 mg/kg ( Rat )	-	-

#### Information on toxicological effects

Symptoms

Erythema (skin redness). May cause redness and tearing of the eyes. Coughing and/ or wheezing. Itching. Rashes Hives.

Delayed and immediate effects as well as chronic effects from short and long-term exposure			
Sensitization May cause sensitization of susceptible persons. May cause sensitization by skin contact. May cause sensitization by inhal			
Mutagenic Effects	No information available		

Carcinogenicity	The table below indicates whether each agency has listed any
	ingredient as a carcinogen

Chemical Name	ACGIH	IARC	NTP	OSHA
Nickel oxide 1313-99-1		Group 2B Group 1	Reasonably Anticipated	X
Lithium Cobalt Oxide (CoLiO2) 12190-79-3	A3	Group 2B		X
Cobalt(II) oxide 1307-96-6	A3	Group 2B		X

ACGIH (American Conference of Governmental Industrial Hygienists)

A1 - Known Human Carcinogen

A3 - Animal Carcinogen

IARC (International Agency for Research on Cancer) Group 1 - Carcinogenic to Humans Group 2B - Possibly Carcinogenic to Humans

NTP (National Toxicology Program)

Known - Known Carcinogen OSHA (Occupational Safety and Health Administration of the US Department of Labor) X- Present

Reproductive Toxicity	Contains a known or suspected reproductive toxin	
STOT - single exposure	No information 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 CFR1910.1200), this product has been determined to cause systemic target organ toxicity from chronic or repeated exposure. (STOT RE).	

Chronic Toxicity	No known effect based on information supplied. Contains a known or suspected carcinogen. Contains a known or suspected reproductive toxin. Possible risk of irreversible effects. Avoid repeated exposure. Prolonged exposure may cause chronic effects. May cause adverse effects on the bone marrow and blood-forming system. Repeated or prolonged skin contact may cause skin irritation and/or dermatitis and sensitization of susceptible persons. May cause adverse liver effects.
Target Organ Effects	Respiratory system. Eyes. Skin. Gastrointestinal tract (GI). Reproductive System. Blood.Central Nervous System (CNS). Central Vascular System (CVS). Kidney. Lungs. Nasal cavities. Cardiovascular system. Systemic Toxicity. Liver.
Aspiration Hazard	No information available.

Numerical measures of toxicity Product Information The following values are calculated based on chapter 3.1 of the GHS document ATEmix (oral) ATEmix (dermal) ATEmix (inhalation-dust/mist)

## **12. ECOLOGICAL INFORMATION**

Ecotoxicity Verv toxic to aquatic life with long lasting effects

Chemical Name	Toxicity to Algae	Toxicity to Fish	Toxicity to Microorganisms	Daphnia Magna (Water Flea)
Nickel oxide 1313-99-1	72h EC50: = 0.18 mg/L (Pseudokirchneriella subcapitata) 96h EC50: 0.174 - 0.311 mg/L (Pseudokirchneriella subcapitata)	96h LC50: > 100 mg/L (Brachydanio rerio) 96h LC50: = 1.3 mg/L (Cyprinus carpio) 96h LC50: = 10.4 mg/L (Cyprinus carpio)		48h EC50: > 100 mg/L 48h EC50: = 1 mg/L
Copper 7440-50-8	96h EC50: 0.031 - 0.054 mg/L (Pseudokirchneriella subcapitata) 72h EC50: 0.0426 - 0.0535 mg/L (Pseudokirchneriella subcapitata)	96h LC50: 0.0068 - 0.0156 mg/L (Pimephales promelas) 96h LC50: = 0.112 mg/L (Poecilia reticulata) 96h LC50: = 0.3 mg/L (Cyprinus carpio) 96h LC50: = 0.8 mg/L (Cyprinus carpio) 96h LC50: = 1.25 mg/L (Lepomis macrochirus) 96h LC50: = 0.052 mg/L (Oncorhynchus mykiss) 96h LC50: = 0.2 mg/L (Pimephales promelas) 96h LC50: < 0.3 mg/L (Pimephales promelas)		48h EC50: = 0.03 mg/L

## Persistence and Degradability

No information available.

#### **Bioaccumulation**

No information available	
Manganese dioxide	<0
1313-13-9	

#### Other adverse effects

No information available.

## **13. DISPOSAL CONSIDERATIONS**

#### Waste treatment methods

Disposal	meth	ods
Contami	nated	Packaging

Should not be released into the environment. Dispose of in accordance with federal, state and local regulations.

### California Hazardous Waste Codes 141

Chemical Name	California Hazardous Waste	
Lithium Cobalt Oxide (CoLiO2)	Toxic	
12190-79-3		
Cobalt(II) oxide	Toxic	
1307-96-6		
Nickel oxide	Toxic powder	
1313-99-1	Ignitable powder	
Aluminum	Ignitable powder	
7429-90-5		
Copper	Toxic	
7440-50-8		

## **14. TRANSPORT INFORMATION**

Note:	The transportation of primary lithium cells and batteries is regulated by the International Civil Aviation Organization, International Air Transport Association, International Maritime Dangerous Goods Code and the US Department of Transportation. The batteries must meet the following criteria for shipment: 1. Air shipments must meet the requirements listed in Special Provision A45 of the International Air Transport Association Dangerous Goods Regulations. 2. Meet the requirements for the US Department of Transportation listed in 49 CFR 173.185. 3. The transport of primary lithium batteries is prohibited aboard passenger aircraft. Refer to the Federal Register December 15, 2004 (Hazardous Materials; Prohibited on the Transportation of Primary Lithium Batteries and Cells Aboard Passenger Aircraft; Final Rule) Lithium batteries shipped as"Lithium batteries", "Lithium batteries packed with equipment", or"Lithium batteries contained in equipment" may not be classified as"Dangerous Goods" when shipped in accordance with "special provision A45 of IATA-DGR" or "special provision 188 of IMO-IMDG Code"
DOT Decree Shinning Name	NOT REGULATED
Proper Shipping Name	NON REGULATED
Hazard Class	N/A National states of
TDG	Not regulated
MEX	Not regulated
	Not regulated
IATA Deserve Objective News	Not regulated
Proper Shipping Name Hazard Class	Not regulated N/A
IMDG/IMO Brener Shinning Name	Not regulated NON-REGULATED PER SP 188
Proper Shipping Name Hazard Class	N/A
EmS No.	F-A, S-I
RID	Not regulated
ADR	Not regulated
AND	Not regulated
	Not regulated

## **15. REGULATORY INFORMATION**

## **International Inventories**

TSCA Complies DSL All components are listed either on the DSL or NDSL. TSCA - United States Toxic Substances Control Act Section 8(b) Inventory DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List US Federal Regulations SARA 313 Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This

Chemical Name	CAS No	Weight-%	SARA 313 - Threshold Values %
Lithium Cobalt Oxide (CoLiO2)	12190-79-3	37.9	0.1
Cobalt(II) oxide	1307-96-6	7.4	0.1
Manganese dioxide	1313-13-9	15.4	1.0
Nickel oxide	1313-99-1	3.3	0.1
Aluminum	7429-90-5	10	1.0
Copper	7440-50-8	8	1.0

product contains a chemical or chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

#### SARA 311/312 Hazard Categories

Acute Health Hazard	No
Chronic Health Hazard	No
Fire Hazard	No
Sudden release of pressure hazard	No
Reactive Hazard	No

#### **CWA (Clean Water Act)**

This product contains the following substances which are regulated pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

Chemical Name	CWA - Reportable	CWA - Toxic	CWA - Priority	CWA - Hazardous
	Quantities	Pollutants	Pollutants	Substances
Copper 7440-50-8		Х	X	

#### CERCLA

This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302)

Chemical Name	Hazardous Substances RQs	Extremely Hazardous Substances RQs	RQ
Copper 7440-50-8	5000 lb		RQ 5000 lb final RQ RQ 2270 kg final RQ
Aluminum 7429-90-5			
Nickel oxide 1313-99-1			RQ 10 lb final RQ RQ 4.54 kg final RQ

### **US State Regulations**

#### **California Proposition 65**

This product contains the following Proposition 65 chemicals.

Chemical Name	California Proposition 65		
Nickel oxide - 1313-99-1	Carcinogen		
Cobalt(II) oxide - 1307-96-6	Carcinogen		

#### U.S. State Right-to-Know Regulations

Chemical Name	New Jersey	Massachusetts	Pennsylvania	Rhode Island	Illinois
Lithium Cobalt Oxide (CoLiO2) 12190-79-3	Х		X	Х	Х
Cobalt(II) oxide 1307-96-6			X	Х	X
Manganese dioxide 1313-13-9			X	Х	X
Carbon 7440-44-0			X		
Ethylene carbonate 96-49-1		X	X		
Dimethyl carbonate 616-38-6	Х	X	Х		
Diethyl carbonate 105-58-8	Х	X	X		
Nickel oxide 1313-99-1	Х	Х	Х	Х	Х

Copper	Х	Х	Х	Х	Х
7440-50-8					
Aluminum	Х	Х	Х	Х	
7429-90-5					

#### International Regulations Mexico

#### National occupational exposure limits

Component	Carcinogen Status	Exposure Limits
Manganese dioxide		Mexico: TWA= 0.2 mg/m <sup>3</sup>
1313-13-9 (15.4%)		
Nickel oxide		Mexico: TWA 1 mg/m <sup>3</sup>
1313-99-1 (3.3%)		
Copper		Mexico: TWA= 1 mg/m <sup>3</sup>
7440-50-8(8%)		Mexico: TWA= 0.2 mg/m <sup>3</sup>
		Mexico: STEL= $2 \text{ mg/m}^3$
Aluminum		Mexico: TWA= 10 mg/m <sup>3</sup>
7429-90-5(10%)		

Mexico - Occupational Exposure Limits - Carcinogens

#### Canada

WHMIS Hazard Class Non-controlled

# 16. OTHER INFORMATION

NFPA	Health Hazards 1	Flammability 0	Instability 0	Physical and Chemical Hazards -	
HMIS	Health Hazards 3 *	Flammability 0	Physical Hazard 0	Personal Protection	
Chronic Hazard Star Legend * = Chronic Health Hazard					
Prepare	d By	liangSu Tenpower L	ithium Co.,Ltd.		
Issuing Revisio Revisio	n Date	29-June-2015 No information avail	able		

#### Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text

End of Safety Data Sheet