MATERIAL SAFETY DATA SHEET (MSDS)

Date Prepared: Oct.8th, 2010

The products referenced herein are exempt articles and are not subject to OSHA's Hazard Communication Standard requirements for preparation of material safety data sheets. This information sheet is provided as a service to our customers.

Section 1. Product & Company Identification

Product Name: Lithium Ion Battery
Model: PL603496-2S-1600mAh
Normal Voltage: 7.4V
Chemical System: Lithium-ion ($LiCoO_2$-Graphite)
Designated for Recharge: Yes

Electrochemical system :

Electrodes	**Negative electrode** Carbon	**Positive electrode** Lithium cobaltite (LiCoO2)
Electrolyte	Solution of lithium hexafluorophosphate (LiPF6) in a mixture of organic solvents	
Nominal voltage	7.4 Volts	

Equivalent name : lithiated cobalt oxide.
Ethylene Carbonate (EC) + DiMethyl Carbonate (DMC) + DiEthyl Carbonate (DEC).

Manufacture:
YAOAN BATTERY POTECH（SHENZHEN）CO., LTD.
HengLi Industrial Park, 168
Xia-Keng Road, Longgang, Shenzhen, China
Tel: （0755）89640398
Fax: （0755）33290960
http：//www.yaoanbattery.com http://www.newsun-sw.com

Emergency Contact:
Please call the telephone number listed above.

Section 2. Composition (typical weight percentages of basic material)

Li ion cells are generally composed of the following major ingredients:

No	Material	Weight%	Comments
1	Crust(DNP)	5%	Battery case/housing
2	$LiCoO_2$	35%	Positive active material
3	Artificial Graphite	16%	Negative active material
4	copper	10%	Negative electrode substrate
5	Organic carbonate solvent	21%	Electrolyte solvent(Ethylene carbonate based)
6	Aluminum	4%	Positive electrode substrate
7	Polyvinylidene difluoride	1%	Binder polymer commonly used for both electrodes
8	Carbon black	<1%	Conductive additive
9	Polyethylene	5%	Separator membrane
10	Aluminum/Nickel electrodes	3%	Linker

Li ion cells are not manufactured to contain lithium metal

Notice: The information and recommendations set forth are made in good faith and believed to be accurate as of the date of preparation. **Yaoan Battery Potech** makes no warranty, expressed or implied, with respect to this information and disclaims all liabilities from reliance on it.

Section 3. Hazardous Ingredients

Important Note: The battery pack and enclosed cells should not be opened, disassembled, crushed, burned, or exposed to high temperatures (> 60℃, 140°F). Exposure to the following ingredients contained within the battery could be harmful under some circumstances. In case of exposure to cell contents, wash affected area for at least 15minutes with generous amounts of water and seek medical attention. Fires involving these types of batteries should be flooded with water or use CO_2, Foam, or Dry Chemical extinguishing media.

Section 4. Physical Data

Specific Gravity: (H_2O=1): $LiCoO_2$:4.95, Graphite: 2.09~2.2
Melting Point: (℃): $LiCoO_2$ about 1130℃
Appearance and Odor: $LiCoO_2$ is a black, odorless powder.
C is a black, odorless powder.
Organic solvent is a colorless or light yellow liquid.
Lithium salt is a white, crystalline and odorless powder.

Section 5. Chemical

Classification of dangerous substances contained into the product
as per directive 67/548/EEC

Substance		Melting point	Boiling point	Classification			
CAS N°	Chemical symbol			Exposure limit	Indication of danger	Special risk (1)	Safety advices (2)
12190-79-3	LiCoO2	> 1000°C	N/A	0.1 mg/m3 OSHA		R22 R43	S2 S22 S24 S26 S36 S37 S43 S45
EC : 96-49-1 DMC : 616-38-6 DEC : 105-58-8	Organic solvents (EC-DMC DEC)	EC : 38°C DMC : 4°C DEC : -43°C	EC : 243°C DMC : 90°C DEC : 127°C	None established OSHA	Flammable	R21 R22 R41 R42/43	S2 S24 S26 S36 S37 S45
21324-40-3	LiPF6	N/A (decomposes at 160°C)	N/A	None established OSHA	Irritant Corrosive	R14 R21 R22 R41 R43	S2 S8 S22 S24 S26 S36 S37 S45

1 – Nature of special risks :

R 14 Reacts with water.
R 21 Harmful in contact with skin.
R 22 Harmful if swallowed.
R 41 Risk of serious damage to the eye.
R 42/43 May cause sensitization by inhalation and skin contact.
R 43 May cause sensitization by skin contact.

2 – Safety advices:

S 2 Keep out of reach from children.
S 8 Keep away from moisture.
S 22 Do not breathes dust.
S 24 Avoid contact with skin.
S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical attention.
S 36 Wear suitable protective clothing.
S 37 Wear suitable gloves.
S 45 In case of incident seek medical attention.

4 - FIRST AID MEASURES

In case of battery rupture or explosion, evacuate personnel from contaminated area and provide maximum ventilation to clear out fumes/gases.

In all case, seek medical attention.

Eye contact: Flush with plenty of water (eyelids held open) for at least 15minutes.
Skin contact: Remove all contaminated clothing and flush affected areas with plenty of water and soap for at least 15 minutes. Do not apply greases or ointments.
Ingestion: Dilute by giving plenty of water and get immediate medical attention.
Assure that the victim does not aspirate vomited material by use of positional drainage.
Assure that mucus does not obstruct the airway.
Do not give anything by mouth to an unconscious person.
Inhalation: Remove to fresh air and ventilate the contaminated area.
Give oxygen or artificial respiration if needed.

Section 6. Fire and Explosion Hazard Data

Extinguishing Media:	Water
Flammable Limits:	Not available
Special Fire Fighting Procedure:	In case of fire in an adjacent area, use water, CO_2 or dry chemical extinguishers if cells are packed in their original containers since the fuel of the fire is basically paper products. For bulk quantities of unpackaged cells use LITH-X (Graphite Base). In this case, do not use water.

Section 7. Reactivity Data

Stability:	Stable
Conditions to Avoid:	Do not heat, disassemble or recharge.
Hazardous Decomposition or By-products:	N/A

Hazardous polymerization will not occur.

Section 8. Health Hazard Data

Routes of Entry:	Inhalation	Yes
	Skin	Yes
	Ingestion	Yes

Health Hazards (Acute and Chronic):

These chemicals are contained in a sealed can. Risk of exposure occurs only if the battery is mechanically or electrically abused. The most likely risk is an acute exposure when the gas release vent works. Organic solvent has slight toxicity and can irritate skin and eyes. Lithium salt is irritating to skin, eyes and mucous membranes and should be avoided.

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.

Emergency and First Aid Procedures:

In case of skin contact with contents of battery, flush immediately with water. For eye contact, flush with copious amounts of water for 15 minutes. Do not inhale leaked material. If irritation persists, get medical help.

Notice: The information and recommendations set forth are made in good faith and believed to be accurate as of the

date of preparation. **Yaoan Battery Potech** makes no warranty, expressed or implied, with respect to this information and disclaims all liabilities from reliance on it.

Section 9. Precautions for Safe Handling and Use

Steps to be taken in case material is released or spilled:
The preferred response is to leave the area and allow the batteries to cool and the vapors to dissipate.
Avoid skin and eye contact or inhalation of vapors. Remove spilled liquid with absorbent and incinerate.
Waste disposal method:
Dispose in accordance with appropriate regulations. Open cells should be treated as hazardous waste.

Precautions to be taken in handling and storing:
Avoid mechanical or electrical abuse.

Other Precautions:
Batteries may explode or cause burns, if disassembled, crushed or exposed to fire or high temperatures.
Do not short or install with incorrect polarity.

Section 10. Control Measure

Respiratory Protection (Specify Type): Not necessary under conditions of normal use.

Ventilation: Not necessary under conditions of normal use.

Protective Gloves: Not necessary under conditions of normal use.

Eye Protection: Not necessary under conditions of normal use.

Other Protective Clothing or Equipment: Not necessary under conditions of normal use.

Section 11. Recycling and Disposal

All **Yaoan Battery Potech** Li-Ion batteries contain recyclable materials. Recycling options available in your local area should be considered when disposing of this product. Do not dispose of in fire.

11.1 Incineration: Incineration should never be performed by battery users but eventually by trained professionals in authorized facilities with proper gas and fumes treatment.

11.2 Land filling: Leach ability regulations (mg/l)

Component	Leach ability	EC limit	EPA	Other*
Iron	100			5
Nickel	500	2		0.5

11.3 Recycling: Send to authorized recycling facilities, eventually through licensed waste carrier.

Section 12. Transportation

According to PACKING INSTRUCTION 965~970 of IATA DGR 51th Edtion for transportation.

More information concerning shipping,testing.More information concerning shipping,testing,marking and packaging can be obtained from Label master at http://www.labelmaster.com.
Separate Lithium-ion batteries when shipping to preyent short-ckrcuiting.They should be packed in strong packaging for support during transport. Take in a cargo of them without falling, dropping, and breakage. Prevent collapse of cargo piles and wet by rain.

Section 13. Physical and Chemical Properties

13.1 Appearance: (Physical shape and color as supplied) Metal squares, hermetically sealed and fitted with an external plastic box.

13.2 Temperature range:

	Continuous	Occasional
in storage	-20/+35°C	-20/+45°C
during discharge	-20/+ 60°C	- 20/+ 60°C
during charge	0/+ 45°C	0/+ 45°C

13.3 Specific energy: ≈ 135 Wh/kg
(Note: Wh = Nominal voltage x Rated Ah as defined in IEC standard N° 285. kg = Average battery weight)

13.4 Specific pulse power: ≈ 300 Wh/kg

13.5 Mechanical resistance: As defined in relevant IEC standard

Section 14. Stability and Reactivity

Conditions to avoid: Heat above 70°C or incinerate.
Deform, mutilate, crush, pierce, and disassemble.
Short circuit.
Prolonged exposure to humid conditions.
Materials to avoid : N/A.
Hazardous decomposition products : Corrosive/Irritant Hydrogen fluoride (HF) is produced in case of reaction of *lithium hexafluorophosphate (LiPF6)* with water.
Combustible vapors and formation of Hydrogen fluoride (HF) and phosphorous oxides during fire.

Section 15. Toxological Information

Yaoan Battery Potech Lithium Ion batteries do not contain toxic materials.

Section 16. Ecological Information

When properly used or disposed, **Yaoan Battery Potech** Lithium Ion batteries do not present environmental hazard.

Section 17. Other Information / Disclaimer

The information and recommendations set forth are made in good faith and believed to be accurate as of the date of preparation. **Yaoan Battery Potech** makes no warranty, expressed or implied, with respect to this information and disclaims all liabilities from reliance on it.