BAK 深圳市比克动力电池有限公司
SHENZHEN BAK POWER BATTERY CO.,LTD

Material Safety Data Sheet for Lithium Ion Cells

Section 1 Chemical Product and Company Identification

Trade name: Lithium ion cells

Model: All 18650 models manufactured by Shenzhen BAK with capacity less than or equal to 3.5 Ahr.

Nominal voltage: 3.6V or 3.7V

Manufacturer: Shenzhen BAK Power Battery Co., Ltd.

Address: BAK Industry Park, Kui chong Street, Dapeng District,
Shenzhen City, Guangdong Province, China

Telephone: +86-755-61886818

Section 2 Composition/Information on Ingredients[1]

Chemical name	Molecular formula	CAS No.	Classification (approximate)
Lithium transition metal oxide[2]	Li_xMO_2	proprietary	37.3%
Carbon (graphite)	C	7782-42-5	21.0%
Aluminum	Al	7429-90-5	3.27%
Copper	Cu	7440-50-8	7.69%
Steel can	Fe	7439-89-6	13.53%
Electrolyte		proprietary	10.67%
Others		proprietary	6.54%

Notes:

1) Not every product contains all of these materials
2) M means a combination of Co, Ni or Mn. This component may consist of a mixture of compounds, each of which may contain these elements.
3) Mixted materials like Lithium transition metal oxide and Electrolyte did not have CAS No.

Section 3 Hazards Identification

Lithium ion cells are not hazardous when used according to the instructions of the manufacturer under normal conditions. In case of abuse, there is a risk of rupture, fire, heat, or leakage of internal components, which could release hazardous materials.

Section 4 First-aid Measures

Lithium ion cells are not hazardous under normal circumstances. In case of fire or rupture, the leakage of internal hazardous substance and formation of hazardous substance may occur, and the following measures should be taken in case of contact with these:

Eyes: Check for and remove any contact lenses. Immediately flush with plenty of clean water for at lest 15 minutes, seek medical assistance

Skin: Immediately flush with plenty of clean water for 15 minutes; seek medical assistance if reaction is severe.

Inhalation: Remove to fresh air immediately, seek medical assistance, and ventilate the contaminated area.

Ingestion: Rinse mouth with clean water immediately. Make the victim vomit and seek medical assistance.

Section 5 Fire-fighting Measures

Extinguish with plenty of water, dry powder extinguishers, sands or earth. Combustion products and decomposition products include: carbon monoxide, carbon dioxide, hydrogen fluoride, phosphorus fluoride.

Section 6 Accidental Release Measures

When leakage of cells happens, liquid could be absorbed with sands, earth or other inert substance, and the contaminated area should be ventilated.

Section 7 Handling and Storage

Handling Precautions:

Do not short positive and negative terminals by contact with conductors. Do not overheat or incinerate. Do not open, puncture, crush or deform cells

Storage: Store and use away from heat, sparks, open flame, or any other ignition source. Store in a cool, dry environment (less than 35 °C, less than 85% RH).

Section 8 Exposure Controls/Personal Protection

There is no protection required under normal conditions. In case of leakage ventilation is required. Respirator, eye protection, protective gloves and protective clothes are required when dealing with fire and leakage.

Section 9 Physical and Chemical Properties

Form: Solid;
Color: Various;
Odor: Odorless;
pH: Not available;
Flash point: Not available;
Flammability: Not available;
Vapor pressure: Not available;
Solubility (water): Insoluble;

Section 10 Stability and Reactivity

Cells are stable under normal conditions. The following substance may appear in case of fire or leakage: organic carbonate, hydrogen fluoride, carbon monoxide, carbon dioxide, phosphorus fluoride

Section 11 Toxicological Information

Cells are not hazardous when used properly. In case of fire or leakage combustion and decomposition products may cause irritation and toxicity to skin, eye and respiratory systems. Toxicity data of some substance is listed:

Hydrogen fluoride:

Extremely toxic, May be fatal if inhaled or ingested. Readily absorbed through the skin contact may be fatal. Possible mutagen. LCLO: 50 ppm/30m (human beings), LC50: 1276 ppm/1h (rats).

Carbon and graphite:

Slightly hazards in case of skin contact (irritant), ingestion, inhalation, which will cause chronic damage to upper respiratory tract and cardiovascular system.

Copper:

Dust may cause respiratory irritation.

LD50: 3.5 mg kg^{-1}(mouse).

Section 12 Ecological Information

There is no influence on ecology or environment when used and disposed of properly.

Do not let internal components enter marine environment. Avoid releasing to water ways, was te water or ground water.

Section 13 Disposal

Discarded cells should not be treated as ordinary trash. Recycling is recommended and is required by law in many jurisdictions. Do not incinerate. Leaking or damaged cells should be treated as chemical waste. Packaging is normally not contaminated by cells.

Section 14 Transport Information

The following regulations apply to the transport of Lithium Ion cells worldwide:

1) UN Recommendations on the Transport of Dangerous Goods according to which Lithium ion cells are assigned UN ID#3480, UN ID#3481, Class 9, Packing group II
2) International Air Transport Association (IATA) Dangerous Goods Regulations (DGR)
3) International Maritime Organization (IMO) International Maritime Dangerous Goods (IMDG) Code
4) IATA DGR 60th Edition and IATA Lithium Battery Shipping Guidelines 3rd edition for transportation
5) Transport fashion: by air, by sea

Lithium ion batteries containing no more than 20Wh/cell and 100Wh/battery pack energy can be shipped as 'non-dangerous goods' providing the cells have passed the required tests according to UN38.3 (UN Manual of Tests and Criteria, Part III, Subsection 38.3). In this case section II of packing instruction 965-967, section II of IATA-DGR and special provisions 188 of IMO-IMDG code also apply.

Section 15 Regulatory Information

For shipping regulations see section 14

Section 16 Other Information

This document is provided for technical information only. The information is provided in good faith and is believed to be accurate as of the date of preparation. BAK makes no warranty, either express or implied, with respect to this information and disclaims all legal responsibility from reliance on it.

Serial Number	Change item	Change Content	PIC	Date
1	NO	first edition	Luo Qing	2011-3-15
2	Add new information in Section 14	4） IATA DGR 53nd Edition for transportation 5） Transport fashion: by air, by sea	Wang Min	2012-01-04
3		IATA DGR 54th Edition for transportation	Weiqinshu	2012-12-27
4	Section 1 Chemical Product Section2Composition/Information on Ingredients	Nominal voltage: 3.6V or 3.7V add classification（approximate ）	Wang Min	2013-1-13
5	Section 14	IATA DGR 55th Edition for transportation. change the lithium ion batteries as dangerous goods criteria	Wang Min	2013-12-26
6	Section 14	add section II	Wang Min	2014-5-23
7	Section 14	UN ID#3481. In this case section II of packing instruction 965 -967	Fu Rong	2014-9-11
8	Section 14	IATA DGR 56th Edition for transportation. change the lithium ion batteries as dangerous goods criteria	Fu Rong	2014-12-10
9	Section 1	Telephone: +86-755-61886818	Fu Rong	2014-12-30
10	Section 1	Shenzhen BAK Power Battery Co., Ltd.	Fu Rong	2015-1-7
11	Section 2 Section 9 Section 12	Section2 Composition Information on Ingredients(1) Section 9 Physical and Chemical Properties: Form: Solid; Color: Various; Odor: Odorless; pH: Not available; Flash point: Not available; Flammability: Not available; Vapor pressure: Not available; Solubility (water): Insoluble; Section 12 Ecological Information: Do not let internal components enter marine environment. Avoid releasing to water ways, waste water or ground water.	Chen Chang	2015-8-27

12	Section 2	1.Carbon（graphite）CAS No.：7782-42-5 2. Chemical name: Steel can	Ai Xianfeng	2015-10-14
13	Section 14	4.IATA DGR 57th Edition for transportation change the lithium ion batteries as dangerous goods criteria	Ai Xianfeng	2015-12-16
14	Add new information in Section 14	4.IATA DGR 57th Edition and IATA Lithium Battery Shipping Guidelines 3rd edition for transportation	Ai Xianfeng	2016-4-1
15	Section 1 Section 14	Section 1 Dapeng District Section 14 4) IATA DGR 58th Edition and IATA Lithium Battery Shipping Guidelines 3rd edition for transportation	Yang Xueqin	2016-12-15
16	Section 14	Section 14 4) IATA DGR 59th Edition and IATA Lithium Battery Shipping Guidelines 3rd edition for transportation	Li Zhipeng	2017-12-26
17	Section 2	Chemical name：Others, CAS No.: proprietary, Classification（approximate）： 6.54%	Li Zhipeng	2018-1-11
18	Section 1	All 18650 models manufactured by Shenzhen BAK with capacity less than or equal to 3.2 Ahr.	Cheng Shiping	2018-10-26
19	Section 14	Section 14 4) IATA DGR 60th Edition and IATA Lithium Battery Shipping Guidelines 3rd edition for transportation	Cheng Shiping	2018-12-14
20	Section 1	Section 1)Model: All 18650 models manufactured by Shenzhen BAK with capacity less than or equal to 3.5 Ahr.	Cheng Shiping	2018-12-20