Pony Testing International Group

Report No.：GLBPVIGC93903716

MSDS Report

Sample Description　Lithium Manganese Button One-off Battery

Applicant　Tianjin Taihao Lithium Battery Co.,Ltd

Material Safety Data Sheet

According to: ST/SG/AC.10/30/Rev.6 (GHS)
Lithium Manganese Button One-off Battery

Section 1 - Identification of the substance/preparation and of the company/undertaking

Product Identifier
Product name: Lithium Manganese Button One-off Battery
Sample model: CR2025
Relevant identified uses of the substance or mixture and uses advised against
Identified uses: /
Details of the supplier of the safety data sheet
Supplier: Tianjin Taihao Lithium Battery Co.,Ltd
Address: No.16, North Caiyuan Street,Wuqing Development zone, Tianjin 301700
TEL: +86-13622102861 **FAX:** +86-22-82191858
E-mail: longxiu200741@163.com **Emergency Phone:** +86-13622102861

Section 2 - Hazards Identification

Emergency overview: Under normal condition of use of the batteries, the electrode materials and the liquid electrolyte they contained are non-reactive provided the battery integrity is maintained. Risk of exposure exists only in case of mechanical, electrical or thermal abuse. Thus the batteries should not short circuit, recharge, puncture, incinerate, rush, immerse in water, force discharge, or expose to temperatures above the temperature range of the cell or battery. In these cases there is risk of fire or explosion. Internal contents are extremely hazardous. Leaking fluid is corrosive and dangerous upon inhalation. Battery may be explosive at higher temperatures, exposed to fire, charged, short circuited, or crushed.
Classification of the substance or mixture
Classification according to GHS
Not a dangerous substance according to GHS.
Label elements
Pictogram No data available
Signal word No data available
Hazard statement(s) No data available
Precautionary statement(s) No data available
Other hazards
Physical and chemical hazards: See Section 10
Human health hazards: See Section 11
Environmental hazards: See Section 12

Section 3 – Composition/Information on Ingredient

Chemical composition

Component	CAS No.	Formula	Composition	EC No.	GHS CLASS
Manganese dioxide	1313-13-9	MnO_2	30%	215-202-6	Acute Tox. 4 Acute Tox. 4 H302 H332
Graphite	7782-42-5	C	3%	231-955-3	/
Lithium metal	7439-93-2	Li	2%	231-102-5	Water-react. 1 Skin Corr. 1B H260 H314 EUH014
Polytetrafluoroethylene	9002-84-0	$(C_2F_4)_n$	3%	/	/
Propylene carbonate	108-32-7	$C_4H_6O_3$	3%	203-572-1	Eye Irrit. 2 H319
1,2-dimethoxyethane	110-71-4	$C_4H_{10}O_2$	3%	203-794-9	Flam. Liq. 2 Repr. 1B Acute Tox. 4 H225 H360FD H332
Lithium perchlorate	7791-03-9	$LiClO_4$	0.5%	232-237-2	Ox. Sol. 2 Skin Irrit. 2 Eye Irrit. 2 STOT SE 3 H272 H315 H319 H335
Polypropylene	9003-07-0	$[C_3H_6]n$	3.5%	/	/
Stainless steel	12597-68-1	/	52%	/	/

For the full text of H-Statements mentioned in this Section, see Section 16.

Section 4-First Aid Measures

Description of first aid measures

Eye Contact: If battery is leaking and material contacts the eye, flush thoroughly with copious amounts of running water for 15 minutes (remove contact lenses if easily possible). Occasionally lifting the upper and lower eyelids, until no evidence of the chemical remains. Get medical aid.

Skin Contact: If battery is leaking and material contacts the skin, remove any contaminated clothing and flush exposed skin with copious amounts of running water for at least 15 minutes. If irritation, injury or pain persists, seek medical advice.

Ingestion: Do not induce vomiting. Never give anything by mouth to an unconscious person. Get medical aid. Loosen tight clothing such as a collar, tie, belt or waistband.

Inhalation: Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek medical attention if irritation develops or persists. WARNING: It may be hazardous to the person

providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention.

Personal protective equipment for first-aid responders:

No further relevant information available.

Most important symptoms/effects, acute and delayed:

No further relevant information available.

Indication of immediate medical attention and special treatment needed:

Treat symptomatically.

Section 5 - Fire-Fighting Measures

Extinguishing media

Suitable Extinguishing Media:

Lith-X powder, Class D fire extinguisher, Dry Lithium Chloride, Graphite Powder, Pyrene G-1.

Special hazards arising from the substance or mixture:

Thermal decomposition can lead to release of irritating gases and vapors. Do not short circuit, recharge, over discharge (discharge below 0.0 Volts), puncture, crush or expose to temperatures above the maximum rated temperature as specified by the manufacturer**.** Cell may leak, vent, or explode. If a bright white flame is present, lithium content is exposed and on fire; use a Class D fire extinguisher, Do not use water.

Advice for firefighters:

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear. Cover with Lith-X powder, Class D fire extinguisher, dry lithium chloride, or graphite powder. DO NOT USE WATER, moist sand, CO2, Class ABC, or soda ash extinguisher.

Section 6 - Accidental Release Measures

Personal precautions, protective equipment and emergency procedures

If the internal battery material leaks. Notify safety personnel of large spills. Clean-up personnel should wear appropriate protective clothing to avoid eye and skin contact and inhalation of vapors or fumes. Increase ventilation. Remove ignition sources, Keep away from heat and flame. Carefully collect batteries and place in an appropriate container for disposal. Damaged batteries that are not hot or burning should be placed in a sealed plastic bag or container.

Environmental precautions

Prevent material from contaminating soil and from entering sewers or waterways.

Methods and materials for containment and cleaning up

Sweep up and place in suitable containers for recycle or disposal according to local / national regulations (see section 13). Keep in suitable, closed containers for disposal.

Reference to other sections

See Section 7 for information on safe handling.

See Section 8 for information on personal protection equipment.

See Section 13 for disposal information.

Section 7 - Handling and Storage

Precautions for safe handling

The batteries should not be opened, destroyed or incinerate, since they may leak or rupture and release to the environment the ingredients that they normally contained in the hermetically sealed container. Do not short circuit terminals, or expose to temperatures above the temperature rating of the battery, over charge the battery, forced over-discharge, throw to fire. Do not crush or puncture the battery, or immerse in liquids. Do not store in direct sunlight. Cells and batteries are not rechargeable batteries and should not becharged. Applying pressure and deforming the battery may lead to disassembly followed by eye skin and throat irritation. Follow manufacturer recommendations regarding maximum recommended current and operating temperature range.

Conditions for safe storage, including any incompatibilities

Store in a cool, dry, well ventilated area which is subject to little temperature change. Do not place the battery near heating equipment, nor expose to direct sunlight for long periods. Elevated temperatures can result in shortened battery life and degrade performance. Keep batteries in original packaging until use and do not jumble them. Do not store batteries in high humidity environment for long periods.

Specific end uses

No data available

Section 8 - Exposure Controls/Personal Protection

Control parameters

Exposure limits:

CAS# 1313-13-9:

ACGIH: TLV - TWA: 0.02 mg(Mn)/m^3 (resp), 0.1 mg(Mn)/m^3 (inhal)
OSHA PEL: Ceiling concentration: 5 mg(Mn)/m^3
Australia-TWA:1 mg(Mn)/m^3 (dust), 1 mg(Mn)/m^3; STEL:3 mg(Mn)/m^3 (fume)
Belgium - TWA: 0.2 mg(Mn)/m^3
Denmark- TWA: 0.2 mg(Mn)/m^3 (dust),0.2 mg(Mn)/m^3 (fume)
Finland-TWA: 0.2 mg(Mn)/m^3, inhal. dust, 0.1 mg(Mn)/m^3, resp. dust
Germany- MAK: 0.02 mg(Mn)/m^3 (resp), 0.2 mg(Mn)/m^3 (inhal)
Japan-OEL: 0.2 mg(Mn)/m^3
Korea- TWA: 5 mg(Mn)/m^3
Mexico- TWA: 0.2 mg(Mn)/m^3, 1 mg(Mn)/m^3 (fume); STEL:3 mg(Mn)/m^3
New zealand- TWA: 1 mg(Mn)/m^3
United Kingdom- TWA: 0.5 mg(Mn)/m^3

CAS# 7782-42-5:

ACGIH: TLV - TWA: 2 mg/m^3 (respirable)
OSHA PEL: 15 mppcf
NIOSH REL: TWA: 2.5 mg/m^3 (resp)
Belgium - TWA: 2 mg/m^3 (resp. dust)
Denmark- TWA: 2.5 mg/m^3 (respirable)

Finland-TWA: 5 mg/m^3
France - VLE: 2 mg/m^3
Germany- MAK: 4 mg/m^3 (inhalable); 1.5 mg/m^3 (respirable)
Japan-OEL: 0.5 mg/m^3 (respirable), 2 mg/m^3 (total)
Korea- TWA: 10 mg/m^3; 2.5 mg/m^3
Netherlands- MAC-TGG: 2 mg/m^3
United Kingdom- TWA: 10 mg/m^3 (inhalable); 4 mg/m^3 (respirable)

CAS# 110-71-4:
Russia- TWA: 10 mg/m^3; STEL:30 mg/m^3

CAS# 9003-07-0:
Russia- STEL: 10 mg/m^3

Engineering Controls

Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Personal Protective Equipment

Eyes Protection: Not necessary under normal conditions. Wear safety glasses with side shields if handling an open or leaking battery.

Skin Protection: Not necessary under normal conditions. Use neoprene or natural rubber gloves if handling an open or leaking battery.

Body Protection: Not necessary under normal conditions. Wear appropriate protective clothing if handling an open or leaking battery.

Respirators Protection: In case of battery venting, provide as much ventilation as possible. Avoid confined areas with venting batteries. Respiratory Protection is not necessary under conditions of normal use.

Other Protection: Do not eat, smoke or drink where material is handled, processed or stored. Wash hands carefully before eating or smoking. To maintain good health habits.

Section 9 - Physical and Chemical Properties

Physical State	Button batteries
Colour	Silver
Odour	Odorless
pH	No data available
Melting point/freezing point	No data available
Boiling point or initial boiling point and boiling range	No data available
Flash point	Not applicable
Flammability (solid, gas)	No data available
Lower and upper explosion limit/ flammability limit	No data available
Vapour pressure	No data available
Relative vapour density	No data available
Density/Relative density	No data available

Solubility	Insoluble
Partition coefficient: n-octanol/water	No data available
Auto-ignition temperature	No data available
Decomposition temperature	No data available
Kinematic viscosity	No data available
Particle characteristics	No data available
Normal Voltage	3v
Capacitance	150mAh
Lithium metal content	0.045g

Section 10 - Stability and Reactivity

Reactivity No data available

Chemical stability Stable under normal conditions.

Possibility of hazardous reactions

Hazardous Polymerization Will not occur.

Hazardous Reactions None under normal processing.

Conditions to avoid Incompatible materials, excess heat, exposure to moist air or water. Mechanical abuse(such as crushing, piercing, and disassembly) and electrical abuse (such as recharging, voltage reversal and short-circuiting).

Incompatible materials Strong mineral acids, water, alkali solutions, strong oxidizing materials and conductive materials

Hazardous decomposition products Reaction of lithium with water: Hydrogen (H_2), Lithium hydroxide (LiOH).Thermal decomposition over 150ºC: Chlorine (Cl_2), Lithium oxide, Li_2O. Electrolyte with water: Hydrogen Chloride (HCl).

Section 11 - Toxicological Information

Information on toxicological effects

Acute toxicity:

CAS# 1313-13-9:

Oral, rat: LD50 = 3478 mg/kg;

CAS# 7439-93-2:

Intraperitoneal, mouse: LD50 = 1000 mg/kg;

CAS# 108-32-7:

Oral, rabbit: LD50 > 20 ml/kg;

CAS# 110-71-4:

Oral, mouse: LD50 = 3200 mg/kg;

Oral, rat: LD50 = 775 mg/kg;

Oral, rabbit: LD50 = 320 mg/kg;

Skin, rabbit: LD50 = 2000 mg/kg;

CAS# 9003-07-0:

Intraperitoneal, rat: LD50 > 110.000 mg/kg;
Intravenous, rat: LD50 > 99.000 mg/kg;
Oral, mouse: LD50 = 5000 mg/kg;
Oral, rat: LD50 > 8000 mg/kg;

Skin corrosion/irritation No data available

Serious eye damage/eye irritation No data available

Respiratory or skin sensitization No data available

Germ cell mutagenicity No data available

Carcinogenicity

Manganese dioxide - IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

Graphite - IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

Lithium metal - IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

Polytetrafluoroethylene- IARC: 3 - Group 3: Not classifiable as to its carcinogenicity to humans.

Propylene carbonate- IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

1,2-dimethoxyethane- IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

Lithium perchlorate- IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

Polypropylene- IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

Stainless steel - IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

Reproductive toxicity No data available

Specific target organ toxicity - single exposure No data available

Specific target organ toxicity - repeated exposure No data available

Aspiration hazard No data available

Potential Health Effects

Eye: No special hazard risk under normal use. Contact with battery contents may cause severe irritation and burns. Eye damage is possible.

Skin: No special hazard risk under normal use. Contact with battery contents may cause severe irritation and burns. May be absorbed through the skin causing localized inflammation.

Ingestion: May cause severe and permanent damage to the digestive tract. May cause circulatory system failure.Contents of an open battery can cause serious chemical burns of mouth, esophagus, and gastrointestinal tract.

Inhalation: Inhalation of vapors or fumes released due to heat or a large number of leaking batteries may cause

respiratory irritation. Irritation may lead to chemical pneumonitis. Inhalation can produce chronic productive cough, and shortness of breath.

Signs and Symptoms of Exposure

Under normal condition of use of the batteries, the electrode materials and the liquid electrolyte they contained are non-reactive provided the battery integrity is maintained. Risk of exposure exists only in case of mechanical, electrical or thermal abuse. Thus the batteries should not short circuit, recharge, puncture, incinerate, rush, immerse in water, force discharge, or expose to temperatures above the temperature range of the cell or battery. In these cases there is risk of fire or explosion. Internal contents are extremely hazardous. Leaking fluid is corrosive and dangerous upon inhalation. Battery may be explosive at higher temperatures, exposed to fire, charged, short circuited, or crushed.

Additional Information

RTECS#: CAS# 1313-13-9: OP0350000/ CAS# 7782-42-5: MD9659600/ CAS# 7439-93-2: OJ5540000/ CAS# 9002-84-0: KX4025000/ CAS# 108-32-7: FF9650000/ CAS# 110-71-4: KI1451000/ CAS# 7791-03-9: Unlisted/ CAS# 9003-07-0: UD1842000/ CAS# 12597-68-1: Unlisted

Section 12 - Ecological Information

Toxicity	No data available
Persistence and degradability	No data available
Bioaccumulative potential	No data available
Mobility in soil	No data available
Results of PBT and vPvB assessment	No data available

Other adverse effects

When promptly used or disposed the battery does not present environmental hazard. When disposed, keep away from water, rain and snow.

Section 13 - Disposal Considerations

Waste treatment methods

Waste from Residues / Unused Products: Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

Contaminated packaging: Contaminated packaging material should be treated equivalent to residual chemical. Clean packaging material should be subjected to waste management schemes (recovery recycling, reuse) according to local legislation.

Section 14 - Transport Information

Shipping Name (UN Number)	Lithium metal batteries (UN3090) Lithium metal batteries contained in equipment (UN3091) Lithium metal batteries packed with equipment (UN3091)
Hazard Class	Class 9 (Miscellaneous)
Packing group	II

Method	Organization	Special Provision
Air	IATA	Packing Instruction 968-970
Marine	IMDG	SP188
Rail/Road	RID/ADR	SP188

Their regulations are based on the UN Recommendations. Each special provision provides specifications on exceptions and packaging for lithium metal batteries shipping. A Shipper's Declaration for Dangerous Goods is not required when they meet the requirements of packing instruction 968 Section II or 969 Section II or part 970 Section II of IATA-DGR (58th Edition) or SP188 of IMO-IMDG Code (2014 edition) or SP188 of ADR (2015 edition).

Section 15 - Regulatory Information

Safety, health and environmental regulations/legislation specific for the substance or mixture
Regulatory information: Reference to the local, national, US, EU, CA and international regulations.
Canada

CAS# 12597-68-1 is not listed on Canada's DSL and NDSL List. Other are listed on Canada's DSL List.

US Federal

Toxic Substance Control Act (TSCA)

CAS# 12597-68-1 is not listed on the TSCA Inventory. Other chemicals in this product are listed on the TSCA Inventory.

Inventory of Existing Chemical Substances Produced or Imported in China (IECSC)

All chemicals in this product are listed on the IECSC Inventory.

Section 16 - Additional Information

MSDS Creation Date: Feb 27, 2017

To the best of our knowledge, the information contained herein is accurate. However, neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

Text of H-code(s) mentioned in Section 3

Acute Tox. 4: Acute toxicity, Oral (Category 4)
Acute Tox. 4: Acute toxicity, Inhalation (Category 4)
Skin Corr.1B: Skin corrosion (Category 1B)
Water-react. 1: Substances, which in contact with water, emit flammable gases (Category 1)
Skin Irrit. 2: Skin irritation (Category 2)

Eye Irrit. 2: Eye irritation(Category 2)
STOT SE 3: Specific target organ toxicity - single exposure(Category 3)
Flam. Liq. 2: Flammable liquids (Category 2)
Repr. 1B: Reproductive toxicity (Category 1B)
Ox. Sol. 2: Oxidising solids (Category 2)
H225 Highly flammable liquid and vapour.
H260 In contact with water releases flammable gases which may ignite spontaneously.
H272 May intensify fire; oxidiser.
H302 Harmful if swallowed.
H314 Causes severe skin burns and eye damage.
H315 Causes skin irritation.
H319 Causes serious eye irritation.
H332 Harmful if inhaled.
H335 May cause respiratory irritation.
H360FD May damage fertility. May damage the unborn child.
EUH014 Reacts violently with water.
Other Information:

ACGIH:（American Conference of Governmental Industrial Hygienists）; CAS:（Chemical Abstracts Service）; DSL:（the Domestic Substances List of Canada）; EC:（European Commission）; IARC:（International Agency for Research on Cancer）;IATA:（International Air Transport Association）; IMDG:（International Maritime Dangerous Goods）;ADR: (European Agreement Concerning the International Carriage of Dangerous Goods by Road);RID: (Regulations Concerning the International Carriage of Dangerous Goods by Rail); LD50:（Lethal dose, 50 percent kill）; NDSL:（the Non-domestic Substances List of Canada）; NIOSH:（US National Institute for Occupational Safety and Health）;NTP:（US National Toxicology Program）;OSHA:（US Occupational Safety and Health）; PEL: (Permissible Exposure Level); REL:（Recommended Exposure Limit）; RTECS:（Registry of Toxic Effects of Chemical Substances）; STEL:（Short Term Exposure Limit）;TDG:（Recommendations on the TRANSPORT OF DANGEROUS GOODS Model Regulations）; TSCA:（Toxic Substances Control Act of USA）; IECSC:（Inventory of Existing Chemical Substances Produced or Imported in China）;TWA:（Time Weighted Average）;TLV:（Threshold Limit Value）