

MATERIAL SAFETY DATA SHEET

1、 Identification of the substance and of the company

- **Trade name:** Mercury-free alkaline batteries
- **Trade code:** LR521, LR621, LR721, LR41, LR626, LR754, LR920, LR927, LR1120, LR936, LR1130, LR721, LR43, LR44, 23A, 27A, 377, 377A
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- **Contact:** Judy Zhu
- **Effective Date:** Jan.05,2019

2、 Hazards identification

• EMERGENCY OVERVIEW

WARNING! Products have a risk of explosion when in the heating or short circuit.

This product contain much amounts of electrolyte and acetylene, electrolyte has a corrosive, when the products have leaked electrolyte contact with skin will cause burns.

And inhalation high concentrations of acetylene can cause asphyxiation, Acute poisoning: exposure to 20% concentration, have hypoxia symptoms; the initial excitement, laughing and crying uneasy; Then have dizziness, headache, nausea, vomiting, ataxia, lethargy; and even coma.

- **Potential Health Effects:** This product contain much amounts of zinc. Long-term to contact zinc will lead Thirst, Chest tightness, dry cough, headache, dizziness, high fever, chills and so on. dust will irritant eye. And Long-term repeated exposure will lead to skin irritation.
- **Eye Contact:** Without any eye contact harm to the product itself, when the products have composition leaked Vapor or mist can cause eye irritant.
- **Skin Contact:** Without any skin contact harm to the product itself, when the products have composition leaked leaked On the skin and mucous membrane and other organizations have a role in stimulating and corrosion.
- **Inhalation:** Leakage of gas and dust by inhalation will cause respiratory tract irritation, difficulty in breathing occurred in severe cases, and pulmonary edema.
- **Ingestion:** ingestion may be a choking hazard for children, And not give timely treatment will stimulate the gastrointestinal tract. Harmful and toxic if swallowed.
- **Chronic or Special Toxic Effects:** Used batteries if not be reasonable recycling, the environment will be a lot of harm, the battery contained in the various non-degradable, this material will cause the soil and water pollution, and it will cause the potential chronic health hazards of human.
- **Target Organs:** Overexposure to specific components of this product that are generated in dusts or fumes may cause adverse effects to the following organs or systems: eyes, skin, liver, kidney, central nervous system, cardiovascular system respiratory system.

3、Composition/Information on ingredients

This product contains the following ingredient at levels subject to reporting requirements of:

Components:	CAS Number	EC Number	Approximate(%) by Wt.	Air Exposure Limits(mg/m3)	
				ACGIH TLV(mg/m3)	OSHA PEL(mg/m3)
Zinc	7440-66-6	231-175-3	4~13%	10 Oxide Dust 5 Oxide Fume	10 Oxide Dust 5 Oxide Fume
Manganese dioxide	1313-13-9	215-202-6	25~40%	0.2	5
Potassium hydroxide	1310-58-3	215-181-3	0~22%	2	Not available
Graphite	7782-42-5	231-955-3	5-10%	2 respirable dust	15 mppcf
Sodium hydroxide	1310-73-2	231-659-4	0-12%	2	2

Note: Other ingredients do not contain reportable hazardous ingredients as defined by the OSHA Hazard Communication Standard 29 CFR 1910.1200.

4、First aid measures

- **Eye Contact:** immediately flush eyes with plenty of water for at least 15 minutes occasionally lifting the eye lids. Get medical attention if irritation persists. Thermal burns should be treated as medical emergencies.
- **Skin Contact:** wash with plenty of water. Get medical attention if irritation develops or persists. If thermal burn occurs, flush area with cold water and get immediate medical attention.
- **Inhalation:** remove to fresh air: Such as difficulty in breathing, give oxygen. Such as respiratory arrest, artificial respiration immediately. Medical treatment.
- **Ingestion:** Drink enough water, emetic. Gastric lavage, guided China. Medical treatment.
- **Notes to Physician:** Welding sawing grinding product inhalation of metal fume or metal oxides may produce an acute febrile state, with cough, chills, weakness, and general malais, nausea, muscle cramps, and remarkable leukocytosis. Treatment is symptomatic, and condition is self limited in 24-48 hours. Chronic exposure to dusts may result in pneumoconiosis of mixed type.

5、Fire-fighting measures

- **Autoignition Temperature:** Not applicable
- **Extinguishing Media:** Use dry powder carbon dioxide or sand.
- **Special Fire Fighting Procedures:** Do not use water on combustion products. Firefighters should not enter confined spaces without wearing NIOSH/MSHA approved positive pressure breathing apparatus (SCBA) with full face mask and full protective.
- **Unusual Fire or Explosion Hazards:** Charge in a long time or the case of short circuit and Combustion products due to internal temperature will produce explosion.

6、Accidental release measures

- **Precautions if Material is Spilled or Released:** Leak contaminated areas evacuated personnel quickly to a safe area, and isolation and strict restrictions on access. Proposals emergency personnel wearing positive pressure self-contained breathing apparatus, acid-base anti-wear overalls. Do not direct contact with leakage. Cut off the source of leakage as possible. To prevent the inflow of sewage.

- **Small leakage:** Pick up the Leakage battery.
- **Much leakage:** Check the leaked battery whether broken, there will be no broken to repackaging and shipped the broken battery to the disposal of waste disposal sites.
- **Environmental Precautions:** Product may contain reportable quantities of alloying elements. See Section 15 for additional information.

7、 **Handling and storage**

- **Storage Temperatures:** Stable under normal temperatures and pressures.
- **Precautions to be Taken in Handling and Storing:** Store away from strong oxidizers. Dusts or powders may form Explosive mixtures with air. Avoid breathing dusts or fumes.

8、 **Exposure controls/Personal protection**

Operations with potential for generating high concentrations of airborne particulates of fumes should be evaluated and controlled as necessary.

- **Eye Protection:** Use safety glasses. Dust resistant safety goggles are recommended under circumstances.
- **Skin:** Appropriate protective gloves should be worn as necessary. Good personal hygiene practices should be followed including cleansing exposed skin several times daily with soap and water and laundering or dry cleaning soiled work clothing.
- **Respiratory Protection:** NIOSH/MSHA approved dust/fume/mist respirator should be used to avoid excessive exposure. See Section 2 for component material information exposure limits. If such concentrations are sufficiently high that this Respirator is inadequate, or high enough to cause oxygen deficiency, use a positive self-contained breathing apparatus (SCBA). Follow all applicable respirator use, fitting, and training standards and regulations.
- **Ventilation: Provide general and/or local exhaust ventilation to control airborne levels of dust or fumes below exposure Limits, About exposure limits (PEL) or threshold limit values (TLV) See Section 3.**

9、 **Physical and chemical properties**

• **General Information**

Form:	Solid
Color:	Silver
Odor:	No odor

• **Change in condition**

Melting point/Melting range:	Not available
Boiling point/Boiling range:	Not available

- **Danger of explosion:** When heating or short circuit will have.

• **Solubility in/Miscibility with**

Water:	Not miscible
Density:	Not available

• **Viscosity:**

Dynamic:	Not available
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- **Nominal Voltage:** 1.5V~12V

10、 **Stability and reactivity**

- **Stability:** Stable under normal temperatures and pressures.
- **Conditions to Avoid:** Products to avoid violent collision.



- **Dangerous reactions:** When heated above 70°C risk of rupture occurs. Hazardous polymerization will not occur.
 - **Incompatibility (Materials to Avoid):** acidic, acidic metal, water, strong reducing agents, flammable or combustible.
 - **Hazardous Decomposition Products:** Metallic fumes may be produced during burning, grinding, and possibly machining or any situation with the potential for thermal decomposition.
- 11、 **Toxicological information**
- Breathing fumes of dusts of this product may result in metal fume fever, which is an illness produced by inhaling metal oxides. These oxides are produced by heating various metals including cadmium, zinc, nickel, mercury cobalt, manganese, lead, beryllium, chromium, aluminum, selenium, iron, arsenic and so on.
- **Toxicity to Animals**
LD50: Potassium hydroxide Oral rat 273 mg/kg; Sodium hydroxide Oral Rabbit 500 mg/kg.
LC50: Not available.
 - **On the skin:** Irritating effects known.
 - **On the eye:** Irritating effects known.
- 12、 **Ecological information**
- **Aquatic Ecotoxicological Data, Environmental Fate Data**
The hazardous substances on the environment, special attention should be on the water and soil pollution.
Ecotoxicological effects: Toxic to aquatic organisms.
General notes: Water hazard class 3 (German Regulation)(Self-assessment): Highly hazardous for water.
Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
- 13、 **Disposal consideration**
- **Product:** Must be disposed of in accordance with applicable Federal, state and local regulations.
Recovery and reuse, rather than disposal, should be the ultimate goal of handling efforts.
 - **Recommendation:** Must not be disposed together with household garbage. Do not allow product to reach sewage system.
 - **Uncleaned packaging:** Recommendation Disposal must be made according to official regulations.
- 14、 **Transport information**
- **Packing:** Meets 2019 IATA 60th edition of the Air Transport “Dangerous Goods Regulations”.
 - **PI packaging requirements:** Section II PI965, Section PI966 and Section II PI967.
 - **U.S. Department of Transportation(DOT):** The only requirements for shipping these cells by DOT is special Provision 130 which states: “Batteries, dry are not subject to the requirements of this subchapter only when they are offered for transportation in a manner that prevents the dangerous evolution of heat (for example, by the effective insulation of exposed terminals).”
 - **Air transport ICAO-TI and IATA-DGR:** The only requirements for shipping these cells by ICAO and IATA is Special Provision. A123 which states: “An electrical battery or battery powered device having the potential of dangerous evolutions of heat that is not prepared so as to prevent a short-circuit (e.g. in the case of batteries, by the effective insulation of exposed terminals; or in the case of equipment, by disconnection of the battery and protection of exposed terminals) is forbidden from transportation.”
 - **International Maritime Dangerous Goods Code (IMDG):** regulate them for ocean transportation under Special Provision 304 which says: “Batteries, dry, containing corrosive electrolyte which will not flow out of the battery if the battery case is cracked are not subject to the provisions of this Code provided the batteries are securely packed and protected against short-circuits. Example of such batteries are: alkali-manganese, zinc-

carbon, nickel metal hydride and nickel-cadmium batteries.”

- **Special provisions for Transport:** The products Not a hazard material or hazard goods for transportation, may transport by Air, by Sea, by railway, by road.
- **Transport note:** Separate batteries when shipping to prevent short-circuiting, they should be packed in strong packing, for support during transport, take in a cargo of them without falling, dropping and breakage. Prevent collapse of cargo piles and wet by rain, the container must be handled carefully, Do not give shocks that result in a mark of hitting on a cell.

15、 **Regulatory information**

- **CALIFORNIA PROPOSITION 65**

This product may contains chemicals (antimony [oxide], beryllium [hexavalent], cobalt, cadmium, lead, nickel) known to the State of California to cause cancer and chemicals (cadmium, lead) know to the state of California to cause birth defects or other reproductive harm.

- **Regulatory lists**

Some components of this product may be specifically listed by individual states; other product-specific health and safety Data in other sections of the MSDS may also be applicable for state requirements, For the details on your regulatory requirements, you should contact the appropriate agency in your state.

- **Toxic Substances Control Act (TSCA):** Components of this product are listed on the TSCA inventory.
- **European/International Regulations:** European labeling in Accordance with EC Directives.
- **EINECS:** All substances of the product are listed on the EINECS.
- **Regulation (EC) No 1907/2006:** This battery is not a “substance” or “preparation” according to Regulation (EC) No 1907/2006. Instead it has to be regarded as an “article”.
- **Regulation (EC) No 1272/2008 (CLP/GHS):** This product does not meet the classification requirements of CLP and does not need to be labeled in accordance with CLP.
- **Directive 1999/45/EC:** This product does not meet the classification requirements of Directive 1999/45/EC and does not need to be labeled in accordance with this directive.

16、 **Other information**

The contents and format of this MSDS are in accordance with ISO Commission Directive ISO11014:2009.

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