




Safety Data Sheets (SDSs)

| | | |
|----------------------|---|--|
| Client | Lianzhou Lingli Battery Accessories Co., Ltd. | |
| Add. of Client | Xintang Industrial Transfer Industrial Park, Baoan Town, Lianzhou City, Guangdong Province, China | |
| Description | AAA alkaline zinc-manganese battery | |
| Model /Type | LR03 | |
| Manufacturer | Lianzhou Lingli Battery Accessories Co., Ltd. | |
| Add. of Manufacturer | Xintang Industrial Transfer Industrial Park, Baoan Town, Lianzhou City, Guangdong Province, China | |
| Nominal Voltage | 1.5V | |
| Weight | 11g | |
| Date of Receipt | 2018-11-02 | |
| Laboratory | Shenzhen ZRLK Testing Technology Co., Ltd. | |
| Address | 6F, Fuxinfa Industrial Park, Liuxiandong, Xili Street, Nanshan District, Shenzhen, China | |
| Approved Signatory | Maggie.Gao |  |
| Inspected by | Ailis.Ma |  |
| Censored by | Lahm Peng |  |



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

Product Identifier

Product name: AAA alkaline zinc-manganese battery

Model: LR03

Other means of identification

Synonyms:none

Recommended use of the chemical and restrictions on use

Recommended Use:Used in portabl electronic equipments;

Uses advised against:

- a) Do not dismantle, open or shred alkaline battery.
- b) Do not expose alkaline battery to heat or fire. Avoid storage in direct sunlight.
- c) Do not short-circuit a alkaline battery. Do not store alkaline battery haphazardly in a box or drawer where they may short-circuit each other or be short-circuited by other metal objects.
- d) Do not remove a alkaline battery from its original packaging until required for use.
- e) Do not subject alkaline battery to mechanical shock.
- f) In the event of a alkaline battery leaking, do not allow the liquid to come in contact with the skin or eyes. If contact has been made, wash the affected area with copious amounts of water and seek medical advice.
- g) Observe the plus (+) and minus (-) marks on the alkaline battery and equipment and ensure correct use.
- h) Battery usage by children should be supervised.
- i) Seek medical advice immediately if an alkaline battery has been swallowed.
- j) Keep batteries clean and dry.
- k) When possible, remove the battery from the equipment when not in use.
- l) Dispose of properly.

Details of the supplier of the safety data sheet:

Supplier Name: Lianzhou Lingli Battery Accessories Co., Ltd.

Address: Xintang Industrial Transfer Industrial Park, Baoan Town, Lianzhou City, Guangdong Province ,China

Telephone number of the supplier: 0086-763-6842428

E-mail address: 379817919@qq.com

Fax: 0086-763-6842426

Code postal: 513400

Emergency telephone number

Company Emergency Phone Number: 0086-763-6842426

2. HAZARDS IDENTIFICATION

Classification

| | |
|-----------------------------------|-------------|
| Acute toxicity - Dermal | Category 3 |
| Serious eye damage/eye irritation | Category 2A |
| Carcinogenicity | Category 2 |

| | |
|--|------------|
| Specific target organ toxicity (repeated exposure) | Category 1 |
|--|------------|

GHS Label elements, including precautionary statements**Danger****Hazard statements**

Toxic in contact with skin

Causes serious eye irritation

Suspected of causing cancer

Causes damage to organs through prolonged or repeated exposure

**Precautionary statements-Prevention**

Obtain special instructions before use

Do not handle until all safety precautions have been read and understood

Wear protective gloves/protective clothing/eye protection/face protection

Wash face, hands and any exposed skin thoroughly after handling

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

Do not eat, drink or smoke when using this product

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 water and soap

Call a POISON CENTER or doctor if you feel unwell

Take off immediately all contaminated clothing and wash it before reuse

Precautionary Statements - Storage

Store locked up

Precautionary Statements - Disposal

Dispose of contents/container to an approved waste disposal plant

Other information

harmful if swallowed. Very toxic to aquatic life with long lasting effects.

3. COMPOSITION/INFORMATION ON INGREDIENTS**Chemical characterixation: Mixtures****Description:**

Product: Consisting of the following components.

| Common Chemical Name | Concentration (%) | CAS Number |
|----------------------|-------------------|------------|
| Manganese dioxide | 41.68 | 1313-13-9 |
| Zinc | 17.41 | 7440-66-6 |
| Potassium hydroxide | 8 | 1310-58-3 |
| Water | 9.5 | 7732-18-5 |
| Zinc oxide | 0.4 | 1314-13-2 |
| Graphite | 2.84 | 7782-42-5 |
| Steel | 16.37 | 12597-69-2 |
| Copper | 1.25 | 7440-50-8 |
| Sodium polyacrylate | 0.36 | 9003-04-7 |
| Nylon | 0.72 | 9008-75-7 |
| Polyvinyl chloride | 0.88 | 9002-86-2 |
| Paper | 0.59 | RR-01108-5 |

Note: CAS number is Chemical Abstract Service Registry Number.

N/A=Not apply.

4. FIRST-AID MEASURES**First aid measures**

Eye Contact Rinse thoroughly with plenty of water, also under the eyelids. If symptoms persist, call a physician.

Skin Contact Remove contaminated clothing and shoes. Wash skin with soap and water. In the case of skin irritation or allergic reactions see a physician.

Inhalation Move to fresh air. If symptoms persist, call a physician.

Ingestion Do NOT induce vomiting. Drink plenty of water. If symptoms persist, call a physician.

Most important symptoms and effects, both acute and delayed

Swallowing Do not induce vomiting. Get medical attention.

Most Important Symptoms/Effects No information available.

Indication of any immediate medical attention and special treatment needed

Notes to Physician Treat symptomatically

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media

CO₂, dry chemical powder, water spray.

Unsuitable Extinguishing Media: No information available.

Specific Hazards Arising from the Chemical

Formation of toxic gases is possible during heating or in case of fire.

In case of fire, the following can be released:

Carbon monoxide(CO)

Carbon dioxide

Other irritating and toxic gases.

Hazardous Combustion Products

Carbon oxides.

Explosion Data

Sensitivity to Mechanical Impact No

Sensitivity to Static Discharge 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. For example: Wear self-contained respiratory protective device. Wear suitable protective clothing and eye/face protection.

Special hazards arising from the substance or mixture:

The leaking electrolyte may corrosive. Under the conditions of short-circuited, overcharged, overdischarged, punctured, crushed, put into the fire and exposed on the temperature higher than that specified by manufacture(100°C), the battery may burn or explode.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal Precautions Avoid contact with eyes.

Refer to section 8 for personal protective equipment. Ensure adequate ventilation. Remove all sources of ignition.

Evacuate personnel to safe areas.

Environmental precautions

Environmental Precautions Refer to protective measures listed in Sections 7 and 8.

Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).

Dispose contaminated material as waste according to item 13.

Methods and material for containment and cleaning up

Methods for Containment Prevent further leakage or spillage if safe to do so.

Methods for Cleaning up Use personal protective equipment. Dam up. Cover liquid spill with sand, earth or other Non combustible absorbent material. Pick up and transfer to properly labeled containers. Clean contaminated surface thoroughly.

7. HANDLING AND STORAGE

Precautions for safe handling

Handling Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin, eyes and clothing. Wear personal protective equipment.

Wash thoroughly after handling. Use this material with adequate ventilation.

The product is not explosive.

Conditions for safe storage, including any incompatibilities

The storage area should be clean, cool, dry, ventilated and weatherproof. Incompatibilities: strong oxidizing agents, corrosives and foods. Such batteries must be packed in inner packaging in such a manner as to effectively prevent short circuits and to prevent movement which could lead to short circuits.

For normal storage, the temperature should be between +10°C and +25°C and never exceed +30°C.

Extremes of humidity (over 95% and below 40% relative humidity) for sustained periods should be avoided since they are detrimental to both batteries and packaging. Batteries should therefore not be stored next to radiators or boilers, nor in direct sunlight.

The above recommendations are equally valid for storage conditions during prolonged transit. Thus, Batteries shall be stowed away from ships' engines and not left for long periods in unventilated metal box cars during summer.

Incompatible Products None known.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Control parameters

none

Other Exposure Guidelines Vacated limits revoked by the Court of Appeals decision in AFL-CIO v. OSHA, 965 F.2d 962(11th Cir., 1992).

Appropriate engineering controls

Engineering Measures Showers

Eyewash stations

Ventilation systems

Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits. Ensure adequate ventilation.

Individual protection measures, such as personal protective equipment

Eye/Face Protection:



Tightly sealed goggles

Body protection:

Protective work clothing.

Skin protection:



Protective gloves

Material of gloves:

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.

Penetration time of glove material:

The exact break trough time has to be found out by the manufacturer of the protective gloves and has to be observed.

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.

9. PHYSICAL AND CHEMICAL PROPERTIES

| | |
|--|--|
| Physical State | Form: Cylindrical |
| | Color: Green |
| | Odour: No information available |
| | Odor Threshold: No information available |
| Change in condition: | |
| pH, with indication of the concentration | Not determined. |
| Melting point/freezing point | Not determined. |
| Initial boiling point and Boiling range: | Not determined. |
| Flash Point | Not determined. |
| Evaporation rate | Not determined. |
| Flammability (solid, gas) | Not determined. |
| Upper/lower flammability or explosive limits | Not determined. |
| Vapor Pressure: | Not determined. |
| Vapor Density: | Not determined. |
| relative density: | Not determined. |

| | |
|---------------------------------------|--|
| Solubility in Water: | Not determined. |
| Solubility in other solvents | Not determined. |
| n-octanol/water partition coefficient | Not determined. |
| Auto-ignition temperature | Product is not self-igniting. |
| Decomposition temperature | Not determined. |
| Odour threshold | Not determined. |
| Evaporation rate | Not determined. |
| Viscosity | Not determined. |
| Other Information | No further relevant information available. |

10. STABILITY AND REACTIVITY

Reactivity: Stable under recommended storage and handling conditions (see section 7, Handling and storage).

Chemical stability: Stable under normal conditions of use, storage and transport.

Thermal decomposition/conditions to be avoided: No decomposition if used according to specifications.

Possibility of Hazardous Reactions: None under normal processing.

Hazardous Polymerization: Hazardous polymerization does not occur.

Conditions to avoid: Strong heating, fire, Incompatible materials.

Incompatible materials: Strong oxidizing agents. Strong acids. Base metals.

Hazardous Decomposition Products: Carbon oxides, Other irritating and toxic gases.

11. TOXICOLOGICAL INFORMATION

Acute toxicity: No data available.

Skin corrosion/irritation: No irritant effect.

Serious eye damage/irritation: Cause serious eye irritation.

Respiratory or skin sensitization: No sensitizing effects known.

Specific target organ system toxicity: No information available.

CMR effects (carcinogenicity, mutagenicity and toxicity for reproduction): No information available.

12. Ecological Information

Toxicity:

Acquatic toxicity:

No further relevant information available.

Persistence and degradability: No further relevant information available.

Bioaccumulative potential: No further relevant information available.

Mobility in soil: No further relevant information available.

Results of PBT and vPvB assessment

PBT: Not applicable.

vPvB: Not applicable.

Other adverse effects: No information available.

13. DISPOSAL CONSIDERATIONS

Waste treatment methods

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

Land transport

ADR/RID class: Not regulated.

Maritime transport

Non-Hazardous for sea transport: Non-hazardous for sea transport.

Air transport

Not restricted to IATA DGR according to special provision A123.

The Panasonic alkaline battery according to SP A 123 of the 2017 IATA Dangerous Goods regulations 58th Edition may be transported, and applicable U.S. DOT regulations for the safe transport of Panasonic alkaline battery.

The packaging shall be adequate to avoid mechanical damage during transport, handling and stacking. The materials and pack design shall be chosen so as to prevent the development of unintentional electrical conduction, corrosion of the terminals and ingress of moisture.

The Nickel-cadmium rechargeable battery having the potential of a dangerous evolution of heat must be prepared for transport so as to prevent: (a) 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); and

(b) Accidental activation.

The words "Not Restricted" and the Special Provision number must be included in the description of the substance on the Air Waybill as required by 8.2.6, when an Air Waybill is issued.

The package must be handled with care and that a flammability hazard exists if the package is damaged;

15. REGULATORY INFORMATION

Safety, health and environmental regulations/legislation specific for the substance or mixture

EU Regulation:

Authorisations: No information available.

Restrictions on use: No information available.

Regulatory information



| CAS No. | EU (EINECS) | US (TSCA) | Japan (ENCS) | Canada (DSL/ NDSL) | Australia (AICS) | Korea (ECL) | China (IECSC) |
|------------|-------------|------------|--------------|--------------------|------------------|-------------|---------------|
| 1313-13-9 | Listed | Not listed | Not listed | NDSL | Not listed | Not listed | Not listed |
| 7440-66-6 | Listed | Listed | Listed | DSL | Listed | Listed | Listed |
| 1310-58-3 | Listed | Listed | Listed | DSL | Listed | Listed | Listed |
| 7732-18-5 | Not listed | Listed | Not listed | DSL | Listed | Listed | Listed |
| 1314-13-2 | Not listed | Listed | Not listed | DSL | Listed | Listed | Listed |
| 7782-42-5 | Listed | Listed | Listed | DSL | Listed | Listed | Listed |
| 12597-69-2 | Listed | Listed | Listed | DSL | Listed | Listed | Listed |
| 7440-50-8 | Listed | Not listed | Not listed | NDSL | Not listed | Not listed | Not listed |
| 9003-04-7 | Listed | Listed | Listed | DSL | Listed | Listed | Listed |
| 9008-75-7 | Listed | Listed | Listed | DSL | Listed | Listed | Listed |
| 9002-86-2 | Not listed | Listed | Not listed | DSL | Listed | Listed | Listed |
| RR-01108-5 | Not listed | Listed | Not listed | DSL | Listed | Listed | Listed |

Chemical safety assessment A Chemical Safety Assessment has not been carried out.

16. OTHER INFORMATION

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

Relevant phrases:

R20/22: Harmful by inhalation and if swallowed.

R36: Irritating to eyes.

H302: Harmful if swallowed.

*****End of SDS*****

SAFETY DATA SHEET

Revision Number 1

Issuing Date No data available

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

Product identifier

Product Name alkaline zinc-manganese battery LR6

Other means of identification

Synonyms None

Recommended use of the chemical and restrictions on use

Recommended Use alkaline battery**Uses advised against** No information available

Details of the supplier of the safety data sheet

Supplier Name SHANGHAI XINLI BATTERY CO.,LTD.**Supplier Address** NO433 HAMI ROAD, SHANGHAI CITY
200335
CN**Supplier Phone Number** Phone: +86 021-63731119
Contact Phone: +86 021-63731119**Supplier Email** xinliba@shanghaibattery.com

Emergency telephone number

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.

| | |
|--|---------------------------|
| Serious eye damage/eye irritation | Category 1 |
| Skin corrosion/irritation | Category 1 Sub-category B |
| Acute toxicity - Oral | Category 4 |
| Acute toxicity - Inhalation (Gases) | Category 4 |
| Acute toxicity - Inhalation (Dusts/Mists) | Category 4 |
| Specific target organ toxicity (repeated exposure) | Category 2 |

GHS Label elements, including precautionary statements**Emergency Overview****Danger****Signal word**

Harmful if swallowed

Harmful if inhaled

Causes severe skin burns and eye damage

May cause damage to organs through prolonged or repeated exposure

**Appearance** Yellow**Physical State** Solid containing Liquid**Odor** Odorless**Precautionary Statements - Prevention**

Wash face, hands and any exposed skin thoroughly after handling

Do not eat, drink or smoke when using this product

Use only outdoors or in a well-ventilated area

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

Wear protective gloves/protective clothing/eye protection/face protection

Precautionary Statements - Response

Immediately call a POISON CENTER or doctor/physician

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

Immediately call a POISON CENTER or doctor/physician

Skin

IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower

Wash contaminated clothing before reuse

Inhalation

IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing

Call a POISON CENTER or doctor/physician if you feel unwell

Immediately call a POISON CENTER or doctor/physician

Ingestion

IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell

Rinse mouth

Do NOT induce vomiting

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

Interactions with Other Chemicals

No information available

3. COMPOSITION/INFORMATION ON INGREDIENTS

| Chemical Name | CAS No | Weight-% |
|---------------------|------------|----------|
| Copper | 7440-50-8 | 3.3 |
| Potassium hydroxide | 1310-58-3 | 6 |
| Manganese dioxide | 1313-13-9 | 44.5 |
| Zinc | 7440-66-6 | 18.1 |
| Carbon | 7440-44-0 | 1.3 |
| Nylon-66 | 32131-17-2 | 2.1 |
| Iron | 7439-89-6 | 24.7 |

4. FIRST AID MEASURES**First aid measures****General Advice**

First aid is upon rupture of sealed battery.

General Advice

First aid is upon rupture of sealed battery.

Eye Contact

Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Keep eye wide open while rinsing. Do not rub affected area. Remove contact lenses, if present and easy to do. Continue rinsing. Seek immediate medical attention/advice.

Skin Contact

Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. Seek immediate medical attention/advice.

Inhalation

Remove to fresh air. If breathing has stopped, give artificial respiration. Get medical attention immediately. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. If breathing is difficult, (trained personnel should) give oxygen. Delayed pulmonary edema may occur. 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 or poison control center immediately.

Self-protection of the first aider

Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves and prevent spread of contamination. Avoid contact with skin, eyes or clothing. Avoid direct contact with skin. Use barrier to give mouth-to-mouth resuscitation. 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.

Indication of any immediate medical attention and special treatment needed**Notes to Physician**

Product is a corrosive material. Use of gastric lavage or emesis is contraindicated. Possible perforation of stomach or

esophagus should be investigated. Do not give chemical antidotes. Asphyxia from glottal edema may occur. Marked decrease in blood pressure may occur with moist rales, frothy sputum, and high pulse pressure.

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

The product causes burns of eyes, skin and mucous membranes. Thermal decomposition can lead to release of irritating gases and vapors.

| | |
|--------------------------|---|
| Uniform Fire Code | Corrosive: Other--Solid Toxic: Solid Oxidizer: Class 1--Solid |
|--------------------------|---|

Hazardous Combustion Products

Carbon Oxides

Explosion Data

Sensitivity to Mechanical Impact **No.**

Sensitivity to Static Discharge **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 Attention! Corrosive material. Avoid contact with skin, eyes or clothing. Ensure adequate ventilation. Use personal protective equipment as required. Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak. Avoid breathing vapors or mists. Avoid generation of dust. Do not breathe dust

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 and material for containment and cleaning up

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: Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin, eyes or clothing. In case of insufficient ventilation, wear suitable respiratory equipment. Use only with adequate ventilation and in closed systems. Do not eat, drink or smoke when using this product. Take off contaminated clothing and wash before reuse.

Conditions for safe storage, including any incompatibilities

Storage Keep containers tightly closed in a dry, cool and well-ventilated place. Protect from moisture. Store locked up. Keep out of the reach of children. Store away from other materials.

Incompatible Products Acids. Bases. Oxidizing agent.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters Exposure Guidelines

| Chemical Name | ACGIH TLV | OSHA PEL | NIOSH IDLH |
|----------------------------------|---|--|--|
| Potassium hydroxide 1310-58-3 | TWA: 2 mg/m ³ | (vacated) Ceiling: 2 mg/m ³ | Ceiling: 2 mg/m ³ |
| Manganese dioxide 1313-13-9 | TWA: 0.02 mg/m ³ Mn TWA: 0.1 mg/m ³ Mn | (vacated) Ceiling: 5 mg/m ³ Ceiling: 5 mg/m ³ Mn | IDLH: 500 mg/m ³ Mn TWA: 1 mg/m ³ Mn STEL: 3 mg/m ³ Mn |
| Zinc 7440-66-6 | STEL: 10 mg/m ³ respirable fraction TWA: 2 mg/m ³ respirable fraction | TWA: 5 mg/m ³ fume TWA: 15 mg/m ³ total dust TWA: 5 mg/m ³ respirable fraction | IDLH: 500 mg/m ³ Ceiling: 15 mg/m ³ dust TWA: 5 mg/m ³ dust and fume STEL: 10 mg/m ³ fume |
| Copper 7440-50-8 | TWA: 0.2 mg/m ³ fume TWA: 1 mg/m ³ Cu dust and mist | TWA: 0.1 mg/m ³ fume TWA: 1 mg/m ³ dust and mist (vacated) TWA: 0.1 mg/m ³ Cu dust, fume, mist | IDLH: 100 mg/m ³ dust, fume and mist TWA: 1 mg/m ³ dust and mist TWA: 0.1 mg/m ³ fume |

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 controls

Engineering Measures Showers
Eyewash stations
Ventilation systems

Individual protection measures, such as personal protective equipment

Eye/Face Protection No special protective equipment required.

Skin and Body Protection No special protective equipment required.

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. Contaminated work clothing should not be allowed out of the workplace. Regular cleaning of equipment, work area and clothing is recommended. Wash hands before breaks and immediately after handling the product. For environmental protection, remove and wash all contaminated protective equipment before re-use. Do not breathe dust.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical and Chemical Properties

| | | | |
|-----------------------|--------------------------|-----------------------|--------------------------|
| Physical State | Solid Containing Liquid | | |
| Appearance | yellow | Odor | Odorless |
| Color | No information available | Odor Threshold | No information available |

| <u>Property</u> | <u>Values</u> | <u>Remarks/</u> |
|---|-------------------|-----------------|
| pH | No data available | None known |
| Melting / freezing point | No data available | None known |
| Boiling point / boiling range | No data available | None known |
| Flash Point | No data available | None known |
| Evaporation Rate | No data available | None known |
| Flammability (solid, gas) | No data available | None known |
| Flammability Limit in Air | | |
| Upper flammability limit | No data available | |
| Lower flammability limit | No data available | |
| Vapor pressure | No data available | None known |
| Vapor density | No data available | None known |
| Specific Gravity | No data available | None known |
| Water Solubility | No data available | None known |
| Solubility in other solvents | No data available | None known |
| Partition coefficient: n-octanol/water | 0.0001 | None known |
| Autoignition temperature | No data available | None known |
| Decomposition temperature | No data available | None known |
| Kinematic viscosity | No data available | None known |
| Dynamic viscosity | 0.0001 | None known |
| Explosive properties | No data available | None known |
| Oxidizing Properties | No data available | None known |

Other Information

| | |
|-----------------------------------|-------------------|
| Softening Point | No data available |
| VOC Content (%) | No data available |
| Particle Size | No data available |
| Particle Size Distribution | |

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

Excessive heat.

Incompatible materials

Acids. Bases. Oxidizing agent.

Hazardous Decomposition Products

Carbon oxides.

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). Inhalation of corrosive fumes/gases may cause coughing, choking, headache, dizziness, and weakness for several hours. Pulmonary edema may occur with tightness in the chest, shortness of breath, bluish skin, decreased blood pressure, and increased heart rate. Inhaled corrosive substances can lead to a toxic edema of the lungs. Pulmonary edema can be fatal. May cause irritation of respiratory tract. Harmful by inhalation. |
| Eye Contact | Specific test data for the substance or mixture is not available. Causes burns. (based on components). Corrosive to the eyes and may cause severe damage including blindness. Causes serious eye damage. May cause irreversible damage to eyes. |
| Skin Contact | Specific test data for the substance or mixture is not available. Corrosive. (based on components). Causes burns. |
| Ingestion | Specific test data for the substance or mixture is not available. Causes burns. (based on components). Ingestion causes burns of the upper digestive and respiratory tracts. May cause severe burning pain in the mouth and stomach with vomiting and diarrhea of dark blood. Blood pressure may decrease. Brownish or yellowish stains may be seen around the mouth. Swelling of the throat may cause shortness of breath and choking. May cause lung damage if swallowed. May be fatal if swallowed and enters airways. Ingestion may cause irritation to mucous membranes. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea. May be harmful if swallowed. |

Component Information

| Chemical Name | Oral LD50 | Dermal LD50 | Inhalation LC50 |
|----------------------------------|---------------------|-------------|-----------------|
| Potassium hydroxide 1310-58-3 | = 214 mg/kg (Rat) | - | - |
| Manganese dioxide 1313-13-9 | = 9000 mg/kg (Rat) | - | - |
| Iron 7439-89-6 | = 984 mg/kg (Rat) | - | - |

Information on toxicological effects

Symptoms Erythema (skin redness). Burning. May cause blindness. Coughing and/ or wheezing.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Sensitization No information available.

Mutagenic Effects No information available.

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

IARC (International Agency for Research on Cancer)

Group 3 - Not Classifiable as to Carcinogenicity in Humans

Reproductive Toxicity No information available.

| | |
|---------------------------------|---|
| 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 CFR 1910.1200), 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. Chronic exposure to corrosive fumes/gases may cause erosion of the teeth followed by jaw necrosis. Bronchial irritation with chronic cough and frequent attacks of pneumonia are common. Gastrointestinal disturbances may also be seen. Avoid repeated exposure. Prolonged exposure may cause chronic effects. May cause adverse effects on the bone marrow and blood-forming system. May cause adverse liver effects. Carcinogenic potential is unknown. |
| Target Organ Effects | Respiratory system. Eyes. Skin. Gastrointestinal tract (GI). Blood. Central Nervous System (CNS). Kidney. Cardiovascular system. Lungs. |
| Aspiration Hazard | No information available. |

Numerical measures of toxicity Product Information

No information available.

12. ECOLOGICAL INFORMATION

Ecotoxicity

Toxic to aquatic life with long lasting effects.

| Chemical Name | Toxicity to Algae | Toxicity to Fish | Toxicity to Microorganisms | Daphnia Magna (Water Flea) |
|----------------------------------|---|---|----------------------------|------------------------------|
| Iron 7439-89-6 | | 96h LC50: = 13.6 mg/L (Morone saxatilis) | | |
| 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 |
| Zinc 7440-66-6 | 96h EC50: 0.11 - 0.271 mg/L (Pseudokirchneriella subcapitata) 72h EC50: 0.09 - 0.125 mg/L (Pseudokirchneriella subcapitata) | 96h LC50: 2.16 - 3.05 mg/L (Pimephales promelas) 96h LC50: 0.211 - 0.269 mg/L (Pimephales promelas) 96h LC50: = 2.66 mg/L (Pimephales promelas) 96h LC50: = 30 mg/L (Cyprinus carpio) 96h LC50: = 0.45 mg/L (Cyprinus carpio) 96h LC50: = 7.8 mg/L (Cyprinus carpio) 96h LC50: = 3.5 mg/L (Lepomis macrochirus) 96h LC50: = 0.24 mg/L (Oncorhynchus mykiss) 96h LC50: = 0.59 mg/L (Oncorhynchus mykiss) 96h LC50: = 0.41 mg/L (Oncorhynchus mykiss) | | 48h EC50: 0.139 - 0.908 mg/L |
| Potassium hydroxide 1310-58-3 | | 96h LC50: = 80 mg/L (Gambusia affinis) | | |

Persistence and Degradability

No information available.

Bioaccumulation

| | |
|----------------------------------|------|
| Manganese dioxide 1313-13-9 | <0 |
| Potassium hydroxide 1310-58-3 | 0.83 |

Other adverse effects

No information available.

13. DISPOSAL CONSIDERATIONS

Waste treatment methods

Disposal methods Should not be released into the environment.

Contaminated Packaging Dispose of contents/containers in accordance with local regulations.

California Hazardous Waste Codes 141

This product contains one or more substances that are listed with the State of California as a hazardous waste.

| Chemical Name | California Hazardous Waste |
|----------------------------------|----------------------------|
| Zinc 7440-66-6 | Ignitable powder |
| Potassium hydroxide 1310-58-3 | Toxic Corrosive |
| Copper 7440-50-8 | Toxic |

14. TRANSPORT INFORMATION

DOT NOT REGULATED

Proper Shipping Name NON REGULATED
 Hazard Class N/A

TDG Not regulated

MEX Not regulated

CAO Not regulated

IATA Not regulated

Proper Shipping Name Not regulated

Hazard Class N/A

IMDG/IMO Not regulated

Hazard Class N/A

RID Not regulated

ADR Not regulated

ADN 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 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

| Chemical Name | CAS No | Weight-% | SARA 313 - Threshold Values % |
|--------------------|-----------|----------|-------------------------------|
| Manganese dioxide | 1313-13-9 | 44.5 | 1.0 |
| Zinc | 7440-66-6 | 18.1 | 1.0 |
| Copper - 7440-50-8 | 7440-50-8 | 3.3 | 1.0 |

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 Quantities | CWA - Toxic Pollutants | CWA - Priority Pollutants | CWA - Hazardous Substances |
|---------------------|-----------------------------|------------------------|---------------------------|----------------------------|
| Zinc | | X | X | |
| Potassium hydroxide | 1000 lb | | | X |
| Copper 7440-50-8 | | X | 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 |
|----------------------------------|--------------------------|------------------------------------|--|
| Zinc 7440-66-6 | 1000 lb | | RQ 454 kg final RQ RQ 1000 lb final RQ |
| Potassium hydroxide 1310-58-3 | 1000 lb | | RQ 1000 lb final RQ RQ 454 kg final RQ |
| Copper 7440-50-8 | 5000 lb | | RQ 5000 lb final RQ RQ 2270 kg final RQ |

US State Regulations**California Proposition 65**

This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know Regulations

| Chemical Name | New Jersey | Massachusetts | Pennsylvania | Rhode Island | Illinois |
|----------------------------------|------------|---------------|--------------|--------------|----------|
| Manganese dioxide 1313-13-9 | | X | X | X | |
| Zinc 7440-66-6 | X | X | X | | X |
| Potassium hydroxide 1310-58-3 | X | X | X | | X |
| Copper 7440-50-8 | X | X | X | X | X |
| Carbon 7440-44-0 | | | X | | |

International Regulations**Mexico****National occupational exposure limits**

| Component | Carcinogen Status | Exposure Limits |
|--------------------------------|-------------------|---|
| Manganese dioxide 1313-13-9 | | Mexico: TWA= 0.2 mg/m ³ |
| Copper 7440-50-8 | | Mexico: TWA= 1 mg/m ³ Mexico: TWA= 0.2 mg/m ³ Mexico: STEL= 2 mg/m ³ |

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 - Personal Protection X |
| MIS | Health Hazards | 0 | Flammability | 0 | Physical Hazard | 0 | |

| | |
|----------------------|---------------------------------|
| Prepared By | SHANGHAI XINLI BATTERY CO.,LTD. |
| Revision Date | 16-July-2015 |
| Revision Note | |

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