MATERIAL SAFETY DATA SHEET
Model ICR18650S3 Lithium-Ion Battery
LG CHEMICAL LIMITED

1. Chemical Product and Company Identification

Product Identification
LGCHEM ICR18650S3 Lithium-Ion Battery

Manufacturer
LG Chemical Limited
Twin Tower
Youido-Dong, Youngdeungpo-Ku
Seoul, Korea

Emergency Telephone Number
82-2-3773-7256

2. Composition Information

<table>
<thead>
<tr>
<th>Hazardous Ingredients</th>
<th>%</th>
<th>CAS Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum Foil</td>
<td>2-10</td>
<td>7429-90-5</td>
</tr>
<tr>
<td>Nickel compound (proprietary)</td>
<td>10-25</td>
<td></td>
</tr>
<tr>
<td>Manganese compound (proprietary)</td>
<td>6-15</td>
<td></td>
</tr>
<tr>
<td>Cobalt compound (proprietary)</td>
<td>4-10</td>
<td></td>
</tr>
<tr>
<td>Styrene-Butadiene-Rubber</td>
<td>&lt;1</td>
<td></td>
</tr>
<tr>
<td>Polyvinylidene Fluoride (PVDF)</td>
<td>&lt;5</td>
<td>24937-79-9</td>
</tr>
<tr>
<td>Copper Foil</td>
<td>2-10</td>
<td>7440-50-8</td>
</tr>
<tr>
<td>Carbon (proprietary)</td>
<td>10-30</td>
<td></td>
</tr>
<tr>
<td>Electrolyte (proprietary)</td>
<td>10-20</td>
<td></td>
</tr>
<tr>
<td>Stainless steel and Nickel and inert materials</td>
<td>Remainder</td>
<td>N/A</td>
</tr>
</tbody>
</table>

* Equivalent Lithium Content: 0.66g, Cell Energy: 7.92Wh
3. **Hazards Identification**

**Emergency Overview**

May explode in a fire, which could release hydrogen fluoride gas. Use extinguishing media suitable for materials burning in fire.

**Primary routes of entry**

<table>
<thead>
<tr>
<th>Route of Entry</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skin contact</td>
<td>NO</td>
</tr>
<tr>
<td>Skin absorption</td>
<td>NO</td>
</tr>
<tr>
<td>Eye contact</td>
<td>NO</td>
</tr>
<tr>
<td>Inhalation</td>
<td>NO</td>
</tr>
<tr>
<td>Ingestion</td>
<td>NO</td>
</tr>
</tbody>
</table>

**Symptoms of exposure**

**Skin contact**
No effect under routine handling and use.

**Skin absorption**
No effect under routine handling and use.

**Eye contact**
No effect under routine handling and use.

**Inhalation**
No effect under routine handling and use.

**Reported as carcinogen**
Not applicable
4. **First Aid Measures**

**Inhalation**
Not a health hazard.

**Eye contact**
Not a health hazard.

**Skin contact**
Not a health hazard.

**Ingestion**
If swallowed, obtain medical attention immediately.

**IF EXPOSURE TO INTERNAL MATERIALS WITHIN CELL DUE TO DAMAGED OUTER CASING, THE FOLLOWING ACTIONS ARE RECOMMENDED:**

**Inhalation**
Leave area immediately and seek medical attention.

**Eye contact**
Rinse eyes with water for 15 minutes and seek medical attention.

**Skin contact**
Wash area thoroughly with soap and water and seek medical attention.

**Ingestion**
Drink milk/water and induce vomiting; seek medical attention.
5. **Fire Fighting Measures**

**General Hazard**
Cell is not flammable but internal organic material will burn if the cell is incinerated. Combustion products include, but are not limited to hydrogen fluoride, carbon monoxide and carbon dioxide.

**Extinguishing Media**
Use extinguishing media suitable for the materials that are burning.

**Special Firefighting Instructions**
If possible, remove cell(s) from fire fighting area. If heated above 125°C, cell(s) may explode/vent.

**Firefighting Equipment**
Use NIOSH/MSHA approved full-face self-contained breathing apparatus (SCBA) with full protective gear.

6. **Accidental Release Measures**

**On Land**
Place material into suitable containers and call local fire/police department.

**In Water**
If possible, remove from water and call local fire/police department.

7. **Handling and Storage**

**Handling**
No special protective clothing required for handling individual cells.

**Storage**
Store in a cool, dry place.
8. Exposure Controls / Personal Protection

Engineering controls
Keep away from heat and open flame. Store in a cool dry place.

Personal Protection

Respirator
Not required during normal operations. SCBA required in the event of a fire.

Eye/face protection
Not required beyond safety practices of employer.

Gloves
Not required for handling of cells.

Foot protection
Steel toed shoes recommended for large container handling.

9. Physical and Chemical Properties

<table>
<thead>
<tr>
<th>State</th>
<th>Solid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Odor</td>
<td>N/A</td>
</tr>
<tr>
<td>PH</td>
<td>N/A</td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>N/A</td>
</tr>
<tr>
<td>Vapor density</td>
<td>N/A</td>
</tr>
<tr>
<td>Boiling point</td>
<td>N/A</td>
</tr>
<tr>
<td>Solubility in water</td>
<td>Insoluble</td>
</tr>
<tr>
<td>Specific gravity</td>
<td>N/A</td>
</tr>
<tr>
<td>Density</td>
<td>N/A</td>
</tr>
</tbody>
</table>
10. **Stability and Reactivity**

**Reactivity**
None

**Incompatibilities**
None during normal operation. Avoid exposure to heat, open flame, and corrosives.

**Hazardous Decomposition Products**
None during normal operating conditions. If cells are opened, hydrogen fluoride and carbon monoxide may be released.

**Conditions To Avoid**
Avoid exposure to heat and open flame. Do not puncture, crush or incinerate.

11. **Toxicological Information**

This product does not elicit toxicological properties during routine handling and use.

<table>
<thead>
<tr>
<th>Sensitization</th>
<th>Teratogenicity</th>
<th>Reproductive toxicity</th>
<th>Acute toxicity</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
</tr>
</tbody>
</table>

If the cells are opened through misuse or damage, discard immediately. Internal components of cell are irritants and sensitizers.

12. **Ecological Information**

Some materials within the cell are bioaccumulative. Under normal conditions, these materials are contained and pose no risk to persons or the surrounding environment.
13. **Disposal Considerations**

California regulated debris

RCRA Waste Code : Nonregulated

Dispose of according to all federal, state, and local regulations.

14. **Transport Information**

Lithium Ion batteries are considered to be "Rechargeable batteries" and meet the requirements of transportation by the U.S. Department of Transportation (DOT), International Civil Aviation Administration (ICAO).

Even classified as lithium ion batteries (UN3480), 2010 IATA Dangerous Goods Regulations 51st edition Packing Instruction 965 Section 12 is applied. The Product is handled as Non-Dangerous Goods by meeting the following requirements. (1)

Lithium ion cells and batteries offered for transport are not subject to other additional requirements of the UN Regulations if they meet the following; (1)–(5)

1. for cells, the Watt-hour rating is not more than 20Wh.
2. for batteries, Watt-hour rating is not more than 100Wh.
3. each cell or battery is of the type proven to meet the requirements of each test in the UN Manual of Tests and Criteria Part 3 subsection 38.3.
4. each cells comply with Special Provision A154.
5. Quantity per Package shall not exceed 10kg.

15. **Regulatory Information**

OSHA hazard communication standard (29 CFR 1910.1200)

<table>
<thead>
<tr>
<th>Hazardous</th>
<th>Non-hazardous</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>✔</td>
</tr>
</tbody>
</table>