

Section 1: Product and Company Information

Product Name: Lithium Ion Polymer Battery Cell
Trade Name: Lithium Ion *SuperPolymer®* Battery Cell
Model: MN-Series Battery Cell

Company: Electrovaya Corp.
Address: 2645 Royal Windsor Drive
Mississauga, Ontario L5J 1K9, Canada

Technical Phone: (905) 855-4610
Fax: (905) 822-7953
Emergency Phone: (800) 388-2865

Section 2: Composition/Information on Ingredients

Ingredient Name	CAS #	Approximate weight percentage
Copper	7440-50-8	11
Aluminum	7429-90-5	4
Graphite	7782-42-5	18
Poly(vinylidene fluoride)	24937-79-9	2
Transition metal oxides	Not applicable	50
Ethylene carbonate	96-49-1	5
Lithium hexafluorophosphate	21324-40-3	1
Polypropylene	9003-07-0	4
Ethyl methyl carbonate	623-53-0	5

Section 3: Hazards Identification***Preparation Hazards and Classification******United States/Canada:***

Not dangerous with normal use. The cell should not be opened or burnt. Exposure to the ingredients contained within or their combustion products could be harmful.

European Union (EU):

This cell is not classified as dangerous according to Directive 1999/45/EC and its amendments. This product contains dangerous ingredients. However, there is no expected release during use of the product and there is a barrier preventing exposure of the user and the environment.

Appearance, Colour and Odour

Solid object with no odour.

Primary Route(s) of Exposure

These chemicals are contained in a sealed enclosure. Risk of exposure occurs only if the cell is mechanically, thermally or electrically abused to the point of compromising the enclosure. If this occurs, exposure to the electrolyte solution contained within can occur by inhalation, ingestion, eye contact or skin contact.

Potential Health Effects

Acute (short term): see Section 8 for exposure controls

In the event that this cell has been ruptured, the electrolyte solution contained within is corrosive and can cause chemical burns

Inhalation: Inhalation of materials from a sealed cell is not an expected route of exposure. Vapours or mists from a ruptured cell may cause respiratory irritation.

Ingestion: Swallowing of materials from a sealed cell is not an expected route of exposure. Swallowing the contents of an open cell may cause severe chemical burns to the mouth, esophagus, and gastrointestinal tract.

Skin contact: Skin contact with a sealed cell will not cause any harm. Skin contact with the contents of an open cell may cause severe irritation or chemical burns to the skin.

Eye contact: Eye contact with a sealed cell will not cause any harm. Eye contact with the contents of an open cell may cause severe irritation or chemical burns to the eye.

Chronic (long term): see Section 11 for additional toxicological data

Not applicable

Medical Conditions Aggravated by Exposure

Not applicable

Other Hazards

If the electrolyte from an open cell comes into contact with water, harmful hydrogen fluoride gas may be generated.

Section 4: First Aid Measures

Inhalation

Blow nose and gargle. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Ingestion

Induce vomiting. Give one or two full glasses of water to dilute material. Never give anything by mouth to an unconscious person. Seek medical attention.

Skin Contact

Remove excess material, contaminated clothes and shoes immediately. Wash affected skin with soap and plenty of water.

Eye Exposure

Do not rub eyes. Flush with copious amounts of water for fifteen minutes. Seek medical attention.

Section 5: Fire Fighting Measures
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Flammable Properties

If the cell is ruptured, the material contained within is flammable and corrosive. Rupture may occur if cell is exposed to excessive heat, which may result in the release of flammable and/or corrosive materials.

Suitable Extinguishing Media

Dry chemical powder, carbon dioxide, nitrogen, alcohol-resistant foam, water spray, or water fog.

Explosion Data*Sensitivity to mechanical impact*

May result in the rupture of cell in severe impact.

Sensitivity to static discharge

Not applicable

Specific Hazards Arising from the Chemical

Fires involving lithium cells can be controlled with water. However, hydrogen gas may be generated when water is used, which may pose an explosion hazard indoors, in sewers, or in other confined spaces. Corrosive and/or harmful gases may also be generated during fire.

Protective Equipment and Precautions for Firefighters

Evacuate the area and fight fire from safe distance or protected location. Wear positive pressure self-contained breathing apparatus (SCBA) and structural firefighters' protective clothing or other full protective gear.

NFPA

Health:	0
Flammability	1
Instability	1

Section 6: Accidental Release Measures

Personal Precautions

Evacuate the area of all unnecessary personnel. Eliminate any ignition source until area is determined to be free from explosion or fire hazards. Do not touch spilled material. Wear adequate personal protective equipment as indicated in Section 8.

Environmental Precautions

Prevent spilled material from contaminating soil and from entering sewers, storm drains and waterways.

Method for Containment

Stop the leak if safe to do so. Contain the spilled material with dry sand or earth if safe to do so.

Method for Cleaning Up

Absorb spilled material with dry sand or earth. Place contaminated absorbent into covered waste containers using non-sparking tools and transport outdoors. Collect all contaminated absorbent and dispose according to directions in Section 13. Ventilate area and wash spill site with detergent and water after material pickup is complete. Collect all contaminated wash water for proper disposal.

Section 7: Handling and Storage**Handling***Technical measures*

Prevention of user exposure: Not necessary under normal use.
Prevention of fire and explosion: Not necessary under normal use.

Precaution for safe handling

Do not damage or remove the cell enclosure/case. Never expose cell to fire, high temperatures, water or any other liquid, strong oxidizers, or severe mechanical shocks. Never disassemble, modify or deform cell. Do not connect the positive terminal to the negative terminal with electrically conductive material. Use only the charger supplied with the cell or charge according to the conditions specified by Electrovaya.

Storage

Keep away from heat, sparks, open flame, direct sunlight and high humidity. Do not let cell come in contact with conductive materials, liquids, strong oxidizers or strong acids.

Section 8: Exposure Controls and Personal Protection**Engineering Controls**

No engineering measure is necessary during normal use. In case of cell rupture, use local exhaust ventilation or other engineering controls to control the release of dust, mist, fumes and vapours.

Personal Protective Equipment*Respiratory protection*

Not necessary under normal use. Wear respirator or dust mask if handling an open or ruptured cell.

Skin protection

Not necessary under normal use. Wear neoprene or natural rubber gloves, long sleeve clothing and long trousers if handling an open or ruptured cell.

Eye protection

Not necessary under normal use. Wear safety glasses if handling an open or ruptured cell.

Other Protective Equipment

Safety shower and eyewash fountain should be readily available in the immediate working area.

Hygiene Measures

Do not eat, drink or smoke in working area. Maintain good housekeeping. Wash hands thoroughly after handling. Wash contaminated clothing before reuse.

Section 9: Physical/Chemical Properties

Property	Value
Physical State	Solid
Appearance	Rectangular prismatic object
PH	Not applicable
Boiling Point/Boiling Point Range	Not applicable
Melting Point/Melting Point Range	Not applicable
Freezing Point	Not applicable
Vapour Pressure	Not applicable
Vapour Density	Not applicable
Saturated Vapour Concentration	Not applicable
Specific Gravity/Density	Not applicable
Bulk Density	Not applicable
Solubility in Water	Insoluble
Odour Type	Odourless
Odour Threshold	Not applicable
Volatile Percentage	Not applicable
Volatile Organic Compound Content	Not applicable
Water Content	Not applicable
Solvent Content	Not applicable
Evaporation Rate	Not applicable
Viscosity	Not applicable
Surface Tension	Not applicable
Partition Coefficient	Not applicable
Decomposition Temperature	Not applicable
Flash Point	Not applicable
Explosion Limits	Not applicable
Flammability Limits	Not applicable
Autoignition Temperature	Not applicable
Oxidizing Properties	Not applicable
Refractive Index	Not applicable
Optical Rotation	Not applicable
Miscellaneous Data	Not applicable

Section 10: Stability and Reactivity**Stability**

Stable.

Conditions to Avoid

Do not expose to high temperatures or fire. Do not disassemble, crush, bend or otherwise deform, electrically short or install with incorrect polarity. Avoid exposure to conductive materials, liquids, strong oxidizers and strong acids. Avoid mechanical and electrical abuse.

Incompatibility

Not applicable

Hazardous Decomposition Products

May release harmful/toxic fumes if burnt, heated or soaked in water.

Decomposition Temperature

Not applicable

Possibility of Hazardous Reactions

Not applicable

Section 11: Toxicological Information
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Irritation

Risk of irritation only if cell is mechanically, thermally or electrically abused to the point of compromising the enclosure. If this occurs, irritation to the skin, eyes and respiratory tract may occur.

Sensitization

Not applicable

Neurological Effects

Not applicable

Teratogenicity

Not applicable

Reproductive Toxicity

Not applicable

Mutagenicity

Not applicable

Toxicologically Synergistic Materials

Not applicable

Section 12: Ecological Information

Ecotoxicity

Not applicable

Mobility

Not applicable

Persistence and Degradability

Not applicable

Bioaccumulative Potential

Not applicable

Other Adverse Effects

Not applicable

Section 13: Disposal Considerations***Waste Disposal Method***

The disposal of expired Lithium Ion *SuperPolymer*® cells is not regulated as hazardous waste. However, as with any battery product, it is recommended that cells be completely discharged prior to disposal. Cell recycling is encouraged. DO NOT dump into any sewer, on the ground, or into any body of water. Store material for disposal as indicated in Section 7.

United States

Observe all federal, state, and local environmental laws and regulations when disposing cells.

European Union

Observe all relevant EC Directives as well as national, regional and local environmental laws and regulations when disposing cells. For disposal within the EU, the appropriate code according to the European Waste Catalogue (EWC) should be used.

Canada

Observe all federal, provincial, and local environmental laws and regulations when disposing cells.

Section 14: Transport Information***DOT***

Proper shipping name: Lithium Ion Cell
UN number: 3480
Class: 9
Packing group: II
Hazard label: Miscellaneous Dangerous Goods
PIH: Not PIH

IATA

Proper shipping name: Lithium Ion Cells
IATA UN number: 3480
Hazard class: 9
Packing group: II

Section 15: Regulatory Information***United States******TSCA Status***

All ingredients in the product are listed on the Toxic Substances Control Act (TSCA) inventory.

SARA Title III:

Section 302/304: None
Section 311/321: None
Section 313: None
CERCLA RQ: None

California Proposition 65

This product does not contain chemicals known to the State of California to cause cancer or reproductive toxicity.

European Union*Symbol*

This product is not classified as dangerous according to Directive 1999/45/EC and its amendments.

Risk Phrases

None

Safety Phrases

S2: Keep out of the reach of children.

Canada

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

WHMIS Classification

Not Controlled

New Substance Notification Regulations

Lithium hexafluorophosphate is listed on the Non Domestic Substances List (NDSL). All other ingredients in the product are listed, as required, on the Domestic Substances List (DSL).

NPRI Substances

This product does not contain any National Pollutant Release inventory (NPRI) chemicals.

Section 16: Other Information

Preparation Date

February 27, 2008

Revision Date

November 11, 2009

Revision Summary

Updated from Canadian MSDS standard to ANSI Z400.1-2004 standard

Disclaimer

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