



Safety Data Sheet

Issue Date: 13-Oct-2025

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Version 1

1. IDENTIFICATION

Product identifier

Product Name Upgrade Energy Lithium-Ion Battery

Other means of identification

SDS # RD0602-216000a SDS

Product Code RD0602-216000a
UN/ID No UN3480

Recommended use of the chemical and restrictions on use

Recommended use Battery.

Details of the supplier of the safety data sheet

Supplier Address

Upgrade Energy
145 Sheldon Street
El Segundo, CA 90245
Phone: (310) 692-4383

Emergency telephone number

Emergency Telephone INFOTRAC 1-352-323-3500 (International)
1-800-535-5053 (North America)

2. HAZARDS IDENTIFICATION

Appearance Battery

Physical state Solid

Odor Odorless

Classification

Safety Data Sheets (SDS) are a sub-requirement of the Occupational Safety and Health Administration (OSHA) Hazard Communication Standard, 29 CFR Subpart 1910.1200. This Hazard Communication Standard does not apply to various subcategories including anything defined by OSHA as an "article". OSHA has defined "article" as a manufactured item other than a fluid or particle; (i) which is formed to a specific shape or design during manufacture; (ii) which has end use function(s) dependent in whole or in part upon its shape or design during end use; and (iii) which under normal conditions of use does not release more than very small quantities, e.g. minute or trace amounts of a hazardous chemical, and does not pose a physical hazard or health risk to employees. Because all of our batteries are defined as "articles", they are exempt from the requirements of the Hazard Communication Standard, hence an SDS is not required. However, this Safety Data Sheet (SDS) contains valuable information critical to the safe handling and proper use of this product. This SDS should be retained and available for employees and other users of this product.

Label elements

Hazard statements

The chemicals listed in section 3 are contained in a sealed container. Risk of exposure only occurs if battery is mechanically, thermally, or electrically abused.

Other Information

No information available.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical name	CAS No.	Weight-%
Lithium nickel manganese cobalt oxide	346417-97-8	30-60
Copper	7440-50-8	5-10
Silicon	7440-21-3	3-7
Graphite	7782-42-5	3-7
Aluminum	7429-90-5	1-5
Ethylene carbonate	96-49-1	1-5
Dimethyl carbonate	616-38-6	1-5
Lithium Hexafluorophosphate	21324-40-3	1-5
Poly Vinylidene Fluoride	24937-79-9	1-5

If Chemical Name/CAS No is "proprietary" and/or Weight-% is listed as a range, the specific chemical identity and/or percentage of composition has been withheld as a trade secret.

4. FIRST AID MEASURES**Description of first aid measures**

General Advice	The following information applies if the battery is mechanically, thermally, or electrically abused.
Eye Contact	Immediately flush eyes with water for 30 minutes while lifting the upper and lower lids. Get medical attention.
Skin Contact	Flush affected area with lukewarm water for at least 30 minutes. If skin irritation persists, call a physician.
Inhalation	If symptoms are experienced, remove source of contamination or move victim to fresh air. Get medical attention.
Ingestion	Do NOT induce vomiting. Call a physician or Poison Control Center.

Most important symptoms and effects, both acute and delayed

Symptoms	A shorted lithium battery can cause thermal and chemical burns upon contact with the skin.
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Indication of any immediate medical attention and special treatment needed

Notes to Physician	Treat symptomatically.
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5. FIRE-FIGHTING MEASURES**Suitable Extinguishing Media**

Water. Dry chemical. Carbon dioxide (CO2). Foam.

Unsuitable Extinguishing Media Not determined.**Specific Hazards Arising from the Chemical**

Battery may vent when subjected to excessive heat-exposing, fire, or over voltage condition.

Hazardous combustion products Carbon monoxide. Carbon dioxide (CO2). Decomposition products can include and are not limited to: Aldehydes, hydrogen sulfide, methyl mercaptan, dimethyl sulfide, and oxides of carbon, sulfur and phosphorus.

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	Use personal protective equipment as required. Ventilate affected area.
Other Information	The material contained within the batteries is only expelled under abusive conditions.
For Emergency Responders	If the battery material is released, remove personnel from the area until fumes dissipate.

Environmental precautions**Methods and material for containment and cleaning up**

Methods for Containment	Prevent further leakage or spillage if safe to do so.
Methods for Clean-Up	Use a shovel and cover battery with sand or vermiculite, place in an approved container, and dispose in accordance with section 13.

7. HANDLING AND STORAGE

Precautions for safe handling

Advice on Safe Handling	Do not expose battery or cell to extreme temperatures or fire. Do not disassemble, crush or puncture battery. Avoid mechanical or electrical abuse.
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Conditions for safe storage, including any incompatibilities

Storage Conditions	Insulate positive and negative terminals to avoid short circuit. Keep containers tightly closed in a dry, cool and well-ventilated place. Keep away from heat. Protect from direct sunlight.
Incompatible Materials	If leaked, forbidden to contact with strong oxidizers, mineral acids, strong alkalis, halogenated hydrocarbons.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Guidelines

Chemical name	ACGIH TLV	OSHA PEL	NIOSH
Copper 7440-50-8	TWA: 0.2 mg/m ³ fume	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	TWA: 1 mg/m ³ ; dust and mist TWA: 0.1 mg/m ³ ; fume IDLH: 100 mg/m ³ dust, fume and mist
Silicon 7440-21-3	-	TWA: 15 mg/m ³ total dust TWA: 5 mg/m ³ respirable fraction (vacated) TWA: 10 mg/m ³ total dust (vacated) TWA: 5 mg/m ³ respirable fraction	TWA: 10 mg/m ³ ; total dust TWA: 5 mg/m ³ ; respirable dust

Chemical name	ACGIH TLV	OSHA PEL	NIOSH
Graphite 7782-42-5	TWA: 2 mg/m ³ respirable particulate matter all forms except graphite fibers	TWA: 15 mg/m ³ total dust synthetic TWA: 5 mg/m ³ respirable fraction synthetic TWA: 15 mppcf respirable dust natural (vacated) TWA: 2.5 mg/m ³ respirable dust natural (vacated) TWA: 10 mg/m ³ total dust synthetic (vacated) TWA: 5 mg/m ³ respirable fraction synthetic TWA: 15 mppcf natural	TWA: 2.5 mg/m ³ ; natural respirable dust IDLH: 1250 mg/m ³
Aluminum 7429-90-5	TWA: 1 mg/m ³ respirable particulate matter	TWA: 15 mg/m ³ total dust TWA: 5 mg/m ³ respirable fraction (vacated) TWA: 15 mg/m ³ total dust (vacated) TWA: 5 mg/m ³ respirable fraction	TWA: 10 mg/m ³ ; total dust TWA: 5 mg/m ³ ; respirable dust
Lithium Hexafluorophosphate 21324-40-3	TWA: 2.5 mg/m ³ F	TWA: 2.5 mg/m ³ F (vacated) TWA: 2.5 mg/m ³	IDLH: 250 mg/m ³ F

Appropriate engineering controls**Engineering Controls**

Apply technical measures to comply with the occupational exposure limits.

Individual protection measures, such as personal protective equipment**Eye/Face Protection**

Not necessary under conditions of normal use. In case of battery rupture or leakage, use safety goggles.

Skin and Body Protection

Not necessary under conditions of normal use. In case of battery rupture or leakage, wear rubber apron and Viton rubber gloves.

Respiratory Protection

Not necessary under conditions of normal use. In case of battery venting or rupture, use a self contained full face respiratory mask.

General Hygiene Considerations Handle in accordance with good industrial hygiene and safety practice.**9. PHYSICAL AND CHEMICAL PROPERTIES****Information on basic physical and chemical properties**

Physical state	Solid	Odor	Odorless
Appearance	Battery	Odor Threshold	Not determined
Color	Not determined		

<u>Property</u>	<u>Values</u>	<u>Remarks • Method</u>
pH	No data available	
Melting point / freezing point	No data available	
Initial boiling point and boiling range	No data available	
Flash point	No data available	
Evaporation rate	Not determined	
Flammability (Solid, Gas)	Not determined	
Flammability Limit in Air		
Upper flammability or explosive limits	No data available	

<u>Property</u>	<u>Values</u>	<u>Remarks • Method</u>
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Lower flammability or explosive limits	No data available
Vapor Pressure	Not determined
Relative vapor density	No data available
Relative Density	Not determined
Water Solubility	Insoluble in water
Solubility in other solvents	Not determined
Partition Coefficient	Not determined
Autoignition temperature	No data available
Decomposition temperature	Not determined
Kinematic viscosity	Not applicable
Dynamic viscosity	Not determined
Explosive Properties	Not determined
Oxidizing Properties	Not determined

10. STABILITY AND REACTIVITY

Reactivity

Not reactive under normal conditions.

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

Heating, mechanical and electrical abuse.

Incompatible materials

If leaked, forbidden to contact with strong oxidizers, mineral acids, strong alkalis, halogenated hydrocarbons.

Hazardous decomposition products

None known based on information supplied.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Product Information

Inhalation, skin contact and eye contact are possible when the battery is opened. The following is based on exposure to internal contents

Eye Contact

Corrosive fumes will be very irritating to eyes.

Skin Contact

Corrosive fumes will be very irritating to skin.

Inhalation

Corrosive fumes will be very irritating to mucous membranes.

Ingestion

Do not ingest.

Component Information

Chemical name	Oral LD50	Dermal LD50	Inhalation LC50
Copper 7440-50-8	-	-	> 5.11 mg/L (Rat) 4 h
Chemical name	Oral LD50	Dermal LD50	Inhalation LC50

Silicon 7440-21-3	= 3160 mg/kg (Rat)	-	-
Graphite 7782-42-5	-	-	> 2000 mg/m ³ (Rat) 4 h
Aluminum 7429-90-5	-	-	> 0.888 mg/L (Rat) 4 h
Dimethyl carbonate 616-38-6	= 13 g/kg (Rat)	> 5 g/kg (Rabbit)	> 5.36 mg/L (Rat) 4 h
Ethylene carbonate 96-49-1	= 10 g/kg (Rat)	> 26420 mg/kg (Rabbit)	> 730 mg/m ³ (Rat) 8 h

Symptoms related to the physical, chemical and toxicological characteristics

Symptoms

Please see section 4 of this SDS for symptoms.

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

Carcinogenicity

The table below indicates whether each agency has listed any ingredient as a carcinogen. However, the product as a whole has not been tested.

Chemical name	ACGIH	IARC	NTP	OSHA
Aluminum 7429-90-5	A4 - Not Classifiable as a Human Carcinogen			
Lithium Hexafluorophosphate 21324-40-3	A4 - Not Classifiable as a Human Carcinogen			

Numerical measures of toxicity

Not determined

12. ECOLOGICAL INFORMATION

Ecotoxicity

The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Component Information

Chemical name	Algae/aquatic plants	Fish	Crustacea
Copper 7440-50-8	EC50: 0.0426 - 0.0535mg/L (72h, Pseudokirchneriella subcapitata) EC50: 0.031 - 0.054mg/L (96h, Pseudokirchneriella subcapitata)	LC50: 0.0068 - 0.0156mg/L (96h, Pimephales promelas) LC50: <0.3mg/L (96h, Pimephales promelas) LC50: =0.2mg/L (96h, Pimephales promelas) LC50: =0.052mg/L (96h, Oncorhynchus mykiss) LC50: =1.25mg/L (96h, Lepomis macrochirus) LC50: =0.3mg/L (96h, Cyprinus carpio) LC50: =0.8mg/L (96h, Cyprinus carpio) LC50: =0.112mg/L (96h, Poecilia reticulata)	EC50: =0.03mg/L (48h, Daphnia magna)
Graphite 7782-42-5		LC50: >100mg/L (96h, Danio rerio)	
Dimethyl carbonate 616-38-6		LC50: >=100mg/L (96h, Danio rerio)	
Ethylene carbonate 96-49-1		LC50: >100mg/L (96h, Oncorhynchus mykiss)	

Persistence/Degradability

Not determined.

Bioaccumulation

There is no data for this product.

Mobility

Chemical name	Partition coefficient
Ethylene carbonate 96-49-1	0.11
Dimethyl carbonate 616-38-6	0.354

Other adverse effects

Not determined

13. DISPOSAL CONSIDERATIONS**Disposal methods****Disposal of Wastes**

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Contaminated Packaging

Disposal should be in accordance with applicable regional, national and local laws and regulations.

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

Chemical name	California Hazardous Waste Status
Aluminum 7429-90-5	Ignitable powder

14. TRANSPORT INFORMATION**Note**

Please see current shipping paper for most up to date shipping information, including exemptions and special circumstances.

DOT

UN/ID No UN3480
Proper Shipping Name LITHIUM ION BATTERIES
Transport hazard class(es) 9

IATA

Cargo Aircraft only
UN number or ID number UN3480
Proper Shipping Name LITHIUM ION BATTERIES
Transport hazard class(es) 9

IMDG

UN number or ID number UN3480
Proper Shipping Name LITHIUM ION BATTERIES
Transport hazard class(es) 9

15. REGULATORY INFORMATION

International Inventories

Chemical name	TSCA	TSCA Inventory Status	DSL/NDSL	EINECS/ELINCS	ENCS	IECSC	KECL	PICCS	AICS
Copper	X	ACTIVE	X	X	X	X	X	X	X
Silicon	X	ACTIVE	X	X	X	X	X	X	X
Graphite	X	ACTIVE	X	X		X	X	X	X
Aluminum	X	ACTIVE	X	X	X	X	X	X	X
Dimethyl carbonate	X	ACTIVE	X	X	X	X	X	X	X
Ethylene carbonate	X	ACTIVE	X	X	X	X	X	X	X
Lithium Hexafluorophosphate	X	ACTIVE	X	X	X	X	X	X	X
Poly Vinylidene Fluoride	X	ACTIVE	X		X	X	X	X	X

Legend:

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory

DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List

EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances

ENCS - Japan Existing and New Chemical Substances

IECSC - China Inventory of Existing Chemical Substances

KECL - Korean Existing Chemicals Inventory

PICCS - Philippines Inventory of Chemicals and Chemical Substances

AICS - Australian Inventory of Chemical Substances

US Federal Regulations

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	Reportable Quantity (RQ)
Copper 7440-50-8	5000 lb / 270 kg (final RQ)		RQ 5000 lb final RQ RQ 2270 kg final RQ

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 %
Copper - 7440-50-8	7440-50-8	5-10	1.0
Aluminum - 7429-90-5	7429-90-5	1-5	1.0

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
Copper		X	X	

US State Regulations

California Proposition 65

This product does not contain any Proposition 65 chemicals

U.S. State Right-to-Know Regulations

This product contains the following State Right-to-Know chemicals:

Chemical name	New Jersey	Massachusetts	Pennsylvania
Copper 7440-50-8	X	X	X
Silicon 7440-21-3	X	X	X
Graphite 7782-42-5	X	X	X
Aluminum 7429-90-5	X	X	X
Dimethyl carbonate 616-38-6	X	X	X
Ethylene carbonate 96-49-1		X	X
Lithium Hexafluorophosphate 21324-40-3	X		

16. OTHER INFORMATION**NFPA**
HMISHealth hazards -
Health hazards -Flammability -
Flammability -Instability -
Physical hazards -Special hazards -
Personal protection -

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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