

SAFETY DATA SHEET

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NGHS / English



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1. IDENTIFICATION

Product identifier

Product Name Lithium Ion Battery EB-BT835ABU

Other means of identification

Product Code(s) 1457902

Recommended use of the chemical and restrictions on use

Recommended Use LITHIUM ION BATTERIES

Restrictions on use No information available

Details of the supplier of the safety data sheet

Supplier Identification Samsung Electronics

Address 19 Chapin Road
Building D
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07058
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Emergency telephone number

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2. HAZARDS IDENTIFICATION

Classification

| | |
|--|-------------|
| Skin sensitization | Category 1 |
| Carcinogenicity | Category 1B |
| Specific target organ toxicity (repeated exposure) | Category 1 |



This is a battery. In case of rupture: the above hazards exist.

Appearance Not applicable

Physical state Solid

Odor No information available

GHS Label elements, including precautionary statements

Danger

Hazard statements

May cause an allergic skin reaction

May cause 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

Use personal protective equipment as required

Contaminated work clothing should not be allowed out of the workplace

Wear protective gloves

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

Wash face, hands and any exposed skin thoroughly after handling

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)

Skin

IF ON SKIN: Wash with plenty of soap and water

If skin irritation or rash occurs: Get medical advice/attention

Wash contaminated clothing before reuse

Precautionary Statements - Storage

Store locked up

Precautionary Statements - Disposal

Dispose of contents/container to an approved waste disposal plant

Other information

Toxic to aquatic life with long lasting effects.

Unknown acute toxicity 112.5 % of the mixture consists of ingredient(s) of unknown toxicity

110 % of the mixture consists of ingredient(s) of unknown acute oral toxicity

112.5 % of the mixture consists of ingredient(s) of unknown acute dermal toxicity

112.5 % of the mixture consists of ingredient(s) of unknown acute inhalation toxicity (gas)

112.5 % of the mixture consists of ingredient(s) of unknown acute inhalation toxicity (vapor)

112.5 % of the mixture consists of ingredient(s) of unknown acute inhalation toxicity (dust/mist)

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance

Not applicable.

Mixture

| Chemical name | CAS No. | Weight-% | Hazardous Material Information Review Act registry number (HMIRA registry #) | Date HMIRA filed and date exemption granted (if applicable) |
|--|-------------|----------|--|---|
| Lithium Cobalt Oxide (CoLiO ₂) | 12190-79-3 | 45 | - | - |
| Graphite | 7782-42-5 | 25 | - | - |
| Electrolytes, copper-manufng | 129618-35-5 | 25 | - | - |
| Aluminum | 7429-90-5 | 8 | - | - |
| Nickel | 7440-02-0 | 5 | - | - |
| Polytetrafluoroethylene | 9002-84-0 | 2 | - | - |

4. FIRST AID MEASURES

First aid measures

| | |
|-----------------------|--|
| General advice | First aid is upon rupture of sealed battery. Show this safety data sheet to the doctor in attendance. IF exposed or concerned: Get medical advice/attention. |
| Inhalation | Remove to fresh air. |
| Eye contact | Rinse thoroughly with plenty of water for at least 15 minutes, lifting lower and upper eyelids. Consult a physician. |
| Skin contact | Wash with soap and water. May cause an allergic skin reaction. In the case of skin irritation or allergic reactions see a physician. |
| Ingestion | Clean mouth with water and drink afterwards plenty of water. |

Most important symptoms and effects, both acute and delayed

Symptoms Itching. Rashes. Hives.

Indication of any immediate medical attention and special treatment needed

Note to physicians May cause sensitization in susceptible persons. Treat symptomatically.

5. FIRE-FIGHTING MEASURES

| | |
|---|---|
| Suitable Extinguishing Media | Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. |
| Large Fire | CAUTION: Use of water spray when fighting fire may be inefficient. |
| Unsuitable extinguishing media | Do not scatter spilled material with high pressure water streams. |
| Specific hazards arising from the chemical | Product is or contains a sensitizer. May cause sensitization by skin contact. |
| Hazardous Combustion Products | Carbon oxides. |



Explosion Data

Sensitivity to Mechanical Impact None.
Sensitivity to Static Discharge None.

Special protective equipment for fire-fighters Firefighters should wear self-contained breathing apparatus and full firefighting turnout gear. Use personal protection equipment.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal precautions 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.

Other Information 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

Advice on safe handling In case of rupture: Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin, eyes or clothing. Ensure adequate ventilation. In case of insufficient ventilation, wear suitable respiratory equipment. 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 Conditions Keep containers tightly closed in a dry, cool and well-ventilated place. Store locked up. Keep out of the reach of children.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure Limits

| Chemical name | ACGIH TLV | OSHA PEL | NIOSH IDLH |
|--|---|---|--|
| Lithium Cobalt Oxide (CoLiO ₂) 12190-79-3 | TWA: 0.02 mg/m ³ | - | |
| 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 (vacated) TWA: 2.5 mg/m ³ respirable dust natural | IDLH: 1250 mg/m ³ TWA: 2.5 mg/m ³ respirable dust |



| | | | | |
|--|--|--|--|--|
| | | (vacated) TWA: 10 mg/m ³ total dust synthetic (vacated) TWA: 5 mg/m ³ respirable fraction synthetic TWA: 15 mppcf natural | | |
| Electrolytes, copper-manufng 129618-35-5 | TWA: 1 mg/m ³ Cu dust and mist | TWA: 1 mg/m ³ Ni (vacated) TWA: 0.1 mg/m ³ Ni | IDLH: 100 mg/m ³ Cu dust and mist IDLH: 10 mg/m ³ Ni TWA: 1 mg/m ³ Cu dust and mist TWA: 0.015 mg/m ³ except Nickel carbonyl Ni | |
| 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 | |
| Nickel 7440-02-0 | TWA: 1.5 mg/m ³ | TWA: 1 mg/m ³ (vacated) TWA: 1 mg/m ³ | IDLH: 10 mg/m ³ TWA: 0.015 mg/m ³ | |
| Chemical name | Alberta | British Columbia | Ontario TWAEV | Quebec |
| Lithium Cobalt Oxide (CoLiO ₂) 12190-79-3 | TWA: 0.02 mg/m ³ | TWA: 0.02 mg/m ³ | TWA: 0.02 mg/m ³ | TWA: 0.02 mg/m ³ |
| Graphite 7782-42-5 | TWA: 2 mg/m ³ | TWA: 2 mg/m ³ | TWA: 2 mg/m ³ | TWA: 2 mg/m ³ |
| Electrolytes, copper-manufng 129618-35-5 | TWA: 0.1 mg/m ³ | | TWA: 0.1 mg/m ³ | TWA: 0.1 mg/m ³ |
| Aluminum 7429-90-5 | TWA: 10 mg/m ³ TWA: 5 mg/m ³ | TWA: 1.0 mg/m ³ | TWA: 1 mg/m ³ | TWA: 10 mg/m ³ TWA: 5 mg/m ³ |
| Nickel 7440-02-0 | TWA: 1.5 mg/m ³ | TWA: 0.05 mg/m ³ | TWA: 1 mg/m ³ | TWA: 1 mg/m ³ |
| Polytetrafluoroethylene 9002-84-0 | | | | TWA: 2.5 mg/m ³ |

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 controls Showers
Eyewash stations
Ventilation systems.

Individual protection measures, such as personal protective equipment

Eye/face protection Wear safety glasses with side shields (or goggles).

Hand protection Wear suitable gloves.

Skin and body protection Wear suitable protective clothing.

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.

General hygiene considerations Handle in accordance with good industrial hygiene and safety practice. Do not eat, drink or smoke when using this product. Wash hands before breaks and immediately after handling the product.



9. PHYSICAL AND CHEMICAL PROPERTIES

Physical and Chemical Properties

| | |
|-----------------------|--------------------------|
| Physical state | Solid |
| Appearance | Not applicable |
| Odor | No information available |
| Color | No information available |
| Odor Threshold | Not applicable |

| <u>Property</u> | <u>Values</u> | <u>Remarks Method</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 | | None known |
| 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 |
| Relative density | No data available | None known |
| Water Solubility | Insoluble in water | |
| Solubility(ies) | No data available | None known |
| Partition coefficient: n-octanol/water | N/A | |
| Autoignition temperature | No data available | None known |
| Decomposition temperature | No data available | None known |
| Kinematic viscosity | No data available | None known |
| Dynamic viscosity | No data available | None known |

Other Information

| | |
|-----------------------------------|--------------------------|
| Explosive properties | No information available |
| Oxidizing properties | No information available |
| Softening Point | No information available |
| Molecular Weight | No information available |
| VOC Content (%) | No information available |
| Liquid Density | No information available |
| Bulk Density | No information available |
| Particle Size | No information available |
| Particle Size Distribution | No information available |

10. STABILITY AND REACTIVITY

| | |
|---|---|
| Reactivity | No information available. |
| Chemical stability | Stable under normal conditions. |
| Possibility of Hazardous Reactions | None under normal processing. |
| Hazardous Polymerization | Hazardous polymerization does not occur. |
| Conditions to avoid | None known based on information supplied. |
| Incompatible materials | None known based on information supplied. |
| 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. |
| Eye contact | Specific test data for the substance or mixture is not available. |
| Skin contact | Specific test data for the substance or mixture is not available. May cause sensitization by skin contact. (based on components). Repeated or prolonged skin contact may cause allergic reactions with susceptible persons. |
| Ingestion | Specific test data for the substance or mixture is not available. |

Information on toxicological effects

Symptoms Itching. Rashes. Hives.

Numerical measures of toxicity

Acute Toxicity

Unknown acute toxicity 112.5 % of the mixture consists of ingredient(s) of unknown toxicity
 110 % of the mixture consists of ingredient(s) of unknown acute oral toxicity
 112.5 % of the mixture consists of ingredient(s) of unknown acute dermal toxicity
 112.5 % of the mixture consists of ingredient(s) of unknown acute inhalation toxicity (gas)
 112.5 % of the mixture consists of ingredient(s) of unknown acute inhalation toxicity (vapor)
 112.5 % of the mixture consists of ingredient(s) of unknown acute inhalation toxicity (dust/mist)

Component Information

| Chemical name | Oral LD50 | Dermal LD50 | Inhalation LC50 |
|---------------|----------------------|-------------|-------------------------|
| Nickel | > 9000 mg/kg (Rat) | - | > 10.2 mg/L (Rat) 1 h |

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

| | |
|--|---|
| Skin corrosion/irritation | No information available. |
| Serious eye damage/eye irritation | No information available. |
| Respiratory or skin sensitization | May cause sensitization by skin contact. |
| Germ cell mutagenicity | No information available. |
| Carcinogenicity | Classification based on data available for ingredients. Contains a known or suspected carcinogen. |

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

| Chemical name | ACGIH | IARC | NTP | OSHA |
|---|-------|----------|------------------------|------|
| Lithium Cobalt Oxide (CoLiO ₂) 12190-79-3 | A3 | Group 2B | Reasonably Anticipated | X |
| Electrolytes, copper-manufng | - | Group 1 | Known | X |

| | | | | |
|--------------------------------------|---|----------|------------------------|---|
| 129618-35-5 | | | | |
| Nickel 7440-02-0 | - | Group 2B | Reasonably Anticipated | X |
| Polytetrafluoroethylene 9002-84-0 | - | Group 3 | - | - |

Legend**ACGIH (American Conference of Governmental Industrial Hygienists)**

A3 - Animal Carcinogen

IARC (International Agency for Research on Cancer)

Group 1 - Carcinogenic to Humans

Group 2B - Possibly Carcinogenic to Humans

Group 3 - Not Classifiable as to Carcinogenicity in Humans

NTP (National Toxicology Program)

Known - Known Carcinogen

Reasonably Anticipated - Reasonably Anticipated to be a Human Carcinogen

OSHA (Occupational Safety and Health Administration of the US Department of Labor)

X - Present

| | |
|---------------------------------|---|
| Reproductive toxicity | No information available. |
| STOT - single exposure | No information available. |
| STOT - repeated exposure | Causes damage to organs through prolonged or repeated exposure. |
| Aspiration hazard | 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) |
|---------------|--|---|----------------------------|---|
| Nickel | 72h EC50: = 0.18 mg/L (Pseudokirchneriella subcapitata) 96h EC50: 0.174 - 0.311 mg/L (Pseudokirchneriella subcapitata) | 96h LC50: = 1.3 mg/L (Cyprinus carpio) 96h LC50: > 100 mg/L (Brachydanio rerio) 96h LC50: = 10.4 mg/L (Cyprinus carpio) | - | 48h EC50: = 1 mg/L 48h EC50: > 100 mg/L |

| | |
|--------------------------------------|------------------------------------|
| Persistence and Degradability | No information available. |
| Bioaccumulation | There is no data for this product. |
| Mobility | No information available. |
| Other adverse effects | No information available. |

13. DISPOSAL CONSIDERATIONS

Waste treatment methods

| | |
|--|---|
| Waste from residues/unused products | Dispose of in accordance with local regulations. Dispose of waste in accordance with environmental legislation. |
| Contaminated packaging | Do not reuse empty containers. |

California 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 |
|---|----------------------------------|
| Lithium Cobalt Oxide (CoLiO2) 12190-79-3 | Toxic |
| Electrolytes, copper-manufng 129618-35-5 | Toxic |
| Aluminum 7429-90-5 | Ignitable powder |
| Nickel 7440-02-0 | Toxic powder Ignitable powder |

14. TRANSPORT INFORMATION

Note: The transportation of primary lithium cells and batteries is regulated by the International Civil Aviation Organization, International Air Transport Association, International Maritime Dangerous Goods Code and the US Department of Transportation. The batteries must meet the following criteria for shipment: 1. Air shipments must meet the requirements listed in Special Provision A45 of the International Air Transport Association Dangerous Goods Regulations. 2. Meet the requirements for the US Department of Transportation listed in 49 CFR 173.185. 3. The transport of primary lithium batteries is prohibited aboard passenger aircraft. Refer to the Federal Register December 15, 2004 (Hazardous Materials; Prohibited on the Transportation of Primary Lithium Batteries and Cells Aboard Passenger Aircraft; Final Rule)
Lithium batteries shipped as "Lithium batteries", "Lithium batteries packed with equipment", or "Lithium batteries contained in equipment" may not be classified as "Dangerous Goods" when shipped in accordance with "special provision A45 of IATA-DGR" or "special provision 188 of IMO-IMDG Code"

DOT NOT REGULATED
Proper Shipping Name NON-REGULATED
Hazard Class N/A
Emergency Response Guide Number 147

TDG Not regulated

MEX Not regulated

ICAO Not regulated

IATA Not regulated
Proper Shipping Name NON REGULATED
Hazard Class N/A

IMDG/IMO Not regulated
Hazard Class N/A
EmS-No. F-A, S-I

RID Not regulated

ADR Not regulated

ADN Not regulated

15. REGULATORY INFORMATION



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

Ozone-depleting substances (ODS) Not applicable

Persistent Organic Pollutants Not applicable

Export Notification requirements Not applicable

International Inventories

| | |
|----------------------|---|
| TSCA | Contact supplier for inventory compliance status. |
| DSL/NDSL | Contact supplier for inventory compliance status. |
| EINECS/ELINCS | Contact supplier for inventory compliance status. |
| ENCS | Contact supplier for inventory compliance status. |
| KECL | Contact supplier for inventory compliance status. |
| PICCS | Contact supplier for inventory compliance status. |
| AICS | Contact supplier for inventory compliance status. |

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
KECL - Korean Existing and Evaluated Chemical Substances
PICCS - Philippines Inventory of Chemicals and Chemical Substances
AICS - Australian Inventory of Chemical Substances

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 % |
|---|-------------|----------|-------------------------------|
| Lithium Cobalt Oxide (CoLiO ₂) - 12190-79-3 | 12190-79-3 | 45 | 0.1 |
| Electrolytes, copper-manufng - 129618-35-5 | 129618-35-5 | 25 | 1.0 0.1 |
| Aluminum - 7429-90-5 | 7429-90-5 | 8 | 1.0 |
| Nickel - 7440-02-0 | 7440-02-0 | 5 | 0.1 |

SARA 311/312 Hazard Categories

Should this product meet EPCRA 311/312 Tier reporting criteria at 40 CFR 370, refer to Section 2 of this SDS for appropriate classifications. Under the amended regulations at 40 CFR 370, EPCRA 311/312 Tier II reporting for the 2017 calendar year will need to be consistent with updated hazard classifications.

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 |
|---|-----------------------------|------------------------|---------------------------|----------------------------|
| Electrolytes, copper-manufng 129618-35-5 | | X | | |
| Nickel 7440-02-0 | | 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 |
|---------------------|--------------------------|------------------------------------|---|
| Nickel 7440-02-0 | 100 lb | | RQ 100 lb final RQ RQ 45.4 kg final RQ |

US State Regulations**California Proposition 65**

This product contains the following Proposition 65 chemicals.

| Chemical name | California Proposition 65 |
|--|----------------------------------|
| Electrolytes, copper-manufng - 129618-35-5 | carcinogen, 5/7/2004 |
| Nickel - 7440-02-0 | carcinogen, 10/1/1989 (metallic) |

U.S. State Right-to-Know Regulations

This product may contain substances regulated by state right-to-know regulations.

| Chemical name | New Jersey | Massachusetts | Pennsylvania | Rhode Island | Illinois |
|--|------------|---------------|--------------|--------------|----------|
| Lithium Cobalt Oxide (CoLiO ₂) 12190-79-3 | X | | X | X | X |
| Graphite 7782-42-5 | X | X | X | | |
| Electrolytes, copper-manufng 129618-35-5 | X | | X | X | X |
| Aluminum 7429-90-5 | X | X | X | X | |
| Nickel 7440-02-0 | X | X | X | X | X |
| Polytetrafluoroethylene 9002-84-0 | | | X | | |

16. OTHER INFORMATION

| | | | | |
|-------------|------------------|----------------|--------------------|------------------------------------|
| NFPA | Health hazards 1 | Flammability 0 | Instability 0 | Physical and Chemical Properties - |
| HMIS | Health hazards 0 | Flammability 0 | Physical hazards 0 | Personal Protection X |

Prepared By Product Stewardship
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Revision Date 12-Jul-2018

Revision Note No information available

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

