

# Material Safety Data Sheet

## 1. Product & Company Identification

<b>Product:</b>	Polymer lithium ion battery
<b>Nominal voltage:</b>	3.7 V
<b>Nominal capacity:</b>	450 mAh
<b>Manufacturer:</b>	Conrad Electronic SE
<b>Address:</b>	Klaus-Conrad-Str. 1, D-92240 Hirschau
<b>Telephone:</b>	+49 (0) 9604 / 40 - 8988
<b>Date of issue:</b>	29.07.2017

## 2. Hazards Identification

Emergency overview: This product is an article which contains a chemical substance. Safety information is given for exposure to the article as sold. Intended use of the product should not result in exposure to the chemical substance. This is a battery. In case of rupture: the below hazards exist.

**CAS# 7429-90-5**

### Classification according to GHS

Substances and mixtures which, in contact with water, emit flammable gases (2, 3)

Specific target organ toxicity, repeated exposure (1) (Lung)

Hazardous to the aquatic environment, long-term hazard (4)

### Label elements

**Hazard pictogram(s):**



**Signal word:** Danger

**Hazard statement(s):**

H261 In contact with water releases flammable gas

H372 Causes damage to organs through prolonged or repeated exposure (Lung)

H413 May cause long lasting harmful effects to aquatic life

**Precautionary statement(s):**

**Prevention:**

P223 Do not allow contact with water.

P231 + P232 Handle and store contents under inert gas, Protect from moisture.

P280 Wear protective gloves, protective clothing, eye protection and face protection.

P260 Do not breathe dust.

P264 Wash skin and clothing thoroughly after handling.

P270 Do not eat, drink or smoke when using this product.

P273 Avoid release to the environment.

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### Response:

P302 + P335 + P334: IF ON SKIN: Brush off loose particles from skin and immerse in cool water.

P370 + P378: In case of fire: Use the appropriate media put out the fire.

P314 Get medical advice if you feel unwell.

### Storage:

P402 + P404 Store in a dry place. Store in a closed container.

### Disposal:

P501 Contents handling to approved waste treatment plants.

### CAS# 7440-50-8

### Classification according to GHS

Specific target organ toxicity, single exposure; Respiratory tract irritation (3)

Specific target organ toxicity, repeated exposure (1) (liver)

Hazardous to the aquatic environment, long-term hazard (3)

### Label elements

#### Hazard pictogram(s):



#### Signal word:

Danger

#### Hazard statement(s):

H335 May cause respiratory irritation

H372 Causes damage to organs through prolonged or repeated exposure (liver)

H412 Harmful to aquatic life with long lasting effects

#### Precautionary statement(s):

#### Prevention:

P271 Use only outdoors or in a well-ventilated area.

P260 Do not breathe dust.

P264 Wash skin and clothing thoroughly after handling.

P270 Do not eat, drink or smoke when using this product.

P273 Avoid release to the environment.

### Response:

P304 + P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P312 Call a POISON CENTER or doctor, if you feel unwell.

### Storage:

P403 + P233 Store in a well-ventilated place. Keep container tightly closed.

### Disposal:

P501 Contents or container handling to approved waste treatment plants.

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**CAS# 7440-02-0**

**Classification according to GHS**

Sensitisation, respiratory (1, 1A, 1B)

Sensitisation, skin (1, 1A, 1B)

Carcinogenicity (2)

Specific target organ toxicity, single exposure (1) (respiratory system)

Hazardous to the aquatic environment, long-term hazard (4)

**Label elements**

**Hazard pictogram(s):**



**Signal word:**

Danger

**Hazard statement(s):**

H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled

H317 May cause an allergic skin reactions

H351 Suspected of causing cancer

H372 Causes damage to organs through prolonged or repeated exposure (respiratory system)

H413 May cause long lasting harmful effects to aquatic life

**Precautionary statement(s):**

**Prevention:**

P284 In case of inadequate ventilation wear respiratory protection.

P272 Contaminated work clothing should not be allowed out of the workplace.

P280 Wear protective gloves, protective clothing, eye protection, face protection.

P201 Obtain special instructions before use.

P202 Do not handle until all safety precautions have been read and understood.

P260 Do not breathe dust.

P264 Wash skin and clothing thoroughly after handling.

P270 Do not eat, drink or smoke when using this product.

P273 Avoid release to the environment.

**Response:**

P304 + P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P342 + P311 If experiencing respiratory symptoms: Call a POISON CENTER or doctor.

P302 + P352 IF ON SKIN: Wash with plenty of water.

P333 + P313 If skin irritation or rash occurs: Get medical advice.

P321: Specific treatment.

P362 + P364 Take off contaminated clothing and wash it before reuse.

P308 + P313 If exposed or concerned: Get medical advice.

P308 + P311 If exposed or concerned: Call a POISON CENTER or doctor.



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P314: Get medical advice if you feel unwell.

**Storage:**

P405 Store locked up.

**Disposal:**

P501 Contents or container handling to approved waste treatment plants.

**Other hazards:**

**Physical and chemical hazards:** See Section 10

**Human health hazards:** See Section 11

**Environmental hazards:** See Section 12

### 3. Composition/Information on Ingredients

**Chemical characterization:** Mixture

Chemical Composition	CAS No.	EC#	Weight (%)
Aluminium	7429-90-5	231-072-3	2 - 10
Copper	7440-50-8	231-159-6	5 - 10
Nickel	7440-02-0	231-111-4	0.5 - 5
Cobaltate, lithium	12190-79-3	235-362-0	25 - 50
Graphite	7782-42-5	231-955-3	20 - 30
Polyvinylidene fluoride resin	24937-79-9	607-458-6	0 - 5
Phosphate(1-), hexafluoro-, lithium	21324-40-3	244-334-7	10 - 20
Diaphragm	-	-	5 - 10



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### 4. First Aid Measures

#### Description of first aid measures

##### General information

No special measures required.

##### After eye contact

Flush eyes with plenty of water for several minutes while holding eyelids open. Get medical attention if irritation persists.

##### After skin contact

Remove contaminated clothing and shoes. Immediately wash with water and soap and rinse thoroughly. Wash clothing and shoes before reuse. If irritation occurs, get medical attention.

##### After inhalation

Remove victim to fresh area. Administer artificial respiration if breathing is difficult. Seek medical attention.

##### After swallowing

Do not induce vomiting. Get medical attention.

##### Personal protective equipment for first-aid responders:

No data available.

##### Most important symptoms/effects, acute and delayed:

No data available.

##### Indication of immediate medical attention and special treatment needed:

No data available.

### 5. Fire Fighting Measures

#### Suitable extinguishing media:

Use extinguishing agent suitable for local conditions and the surrounding environment . Such as dry powder, CO<sub>2</sub>.

#### Unsuitable extinguishing media:

No data available.

#### Specific Hazards arising from the chemical:

Special hazards arising from the substance or mixture

Battery may burst and release hazardous decomposition products when exposed to a fire situation. Lithium ion batteries contain flammable electrolyte that may vent, ignite and produce sparks when subjected to high temperature(>150°C(302°F)), when damaged or abused (e.g. mechanical damage or electrical overcharging); may burn rapidly with flare-burning effect; may ignite other batteries in clothes proximity.

#### Specific protective actions for fire-fighters:

Protective equipment: Wear self-contained respirator. Wear fully protective impervious suit.



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### 6. Accidental Release Measures

**Personal precautions:**

Wear protective equipment. Keep unprotected persons away. Ensure adequate ventilation

**Protective equipment:**

No data available.

**Emergency procedures:**

Remove ignition sources, evacuate area. Sweep up using a method that does not generate dust. Collect as much of the spilled material as possible, placed the spilled material into a suitable disposal container. Keep spilled material out of sewers, ditches and bodies of water.

**Environmental precautions:**

Do not allow material to be released to the environment without proper governmental permits.

**Methods and materials for containment and cleaning up:**

All waste must refer to the United Nations, the national and local regulations for disposal.

See Section 7 for information on safe handling.

See Section 8 for information on personal protection equipment.

See Section 13 for disposal information.

### 7. Handling and Storage

**Precautions for safe handling:**

Consumption of food and beverage should be avoided in work areas. Wash hands with soap and water before eating, drinking. Ground containers when transferring liquid to prevent static accumulation and discharge.

**Information about fire and explosion protection:**

Batteries may explode or cause burns, if disassembled, crushed or exposed to fire or high temperatures. Do not short or install with incorrect polarity.

**Conditions for safe storage, including any incompatibilities:**

**Requirements to be met by storerooms and receptacles**

Store in a cool, dry, well-ventilated place.

**Information about storage in one common storage facility**

Keep away from heat, avoiding the long time of sunlight.

**Further information about storage conditions**

Keep container tightly sealed.

**Specific and use**

No data available.

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### 8. Exposure Controls/Personal Protection

Control parameters

CAS No.	ACGIH	NIOSH	OSHA
7429-90-5	TLV-TWA 10 mg/m <sup>3</sup> TLV-TWA 5 mg/m <sup>3</sup>	REL-TWA 2 mg/m <sup>3</sup> REL-TWA 5 mg/m <sup>3</sup> REL-TWA 10 mg/m <sup>3</sup>	PEL-TWA 5 mg/m <sup>3</sup> PEL-TWA 15 mg/m <sup>3</sup>
7440-50-8	TLV-TWA 0.2 mg/m <sup>3</sup> TLV-TWA 1 mg/m <sup>3</sup>	REL-TWA 1 mg/m <sup>3</sup> REL-TWA 0.1 mg/m <sup>3</sup>	PEL-TWA 0.1 mg/m <sup>3</sup> PEL-TWA 1 mg/m <sup>3</sup>
7440-02-0	TLV-TWA 1.5 mg/m <sup>3</sup>	REL-TWA 0.015 mg/m <sup>3</sup>	PEL-TWA 1 mg/m <sup>3</sup>
12190-79-3	N/A	N/A	N/A
7782-42-5	TLV-TWA 2 mg/m <sup>3</sup>	REL-TWA 2.5 mg/m <sup>3</sup>	PEL-TWA 15mppcf PEL-TWA 20mppcf
24937-79-9	N/A	N/A	N/A
21324-40-3	N/A	N/A	N/A

#### Appropriate engineering controls:

The usual precautionary measures for handling chemicals should be followed.

Keep away from foodstuffs, beverages and feed.

Remove all soiled and contaminated clothing immediately.

Wash hands before breaks and at the end of work.

#### Personal Protective Equipment

##### Respiratory protection:

Wear suitable protective mask in order to reduce the respiratory system. A large number of leakage, wear chemical protective clothing, including self-contained breathing apparatus.

##### Hand Protection:

Wear appropriate protective gloves to reduce skin contact.

##### Eyes Protection:

Wear safety goggles or eye protection combined with respiratory protection.

##### Skin and Body Protection:

Working environment required, wear suitable protective clothing to minimize contact with skin. The type of protective equipment must be according to the concentration and the content of certain hazardous substances in the workplace.

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### 9. Physical and Chemical Properties

#### Information on basic physical and chemical properties

Colour:	Silver
Physical State:	Prismatic
Odour:	Not available
Odour threshold:	Not available
pH:	Not available
Melting point/freezing point:	Not available
Initial boiling point and boiling range:	Not available
Flash Point:	Not available
Evaporation rate:	Not available
Flammability (solid, gas):	Not available
Explosion Limits (vol% in air):	Not available
Vapour pressure, kPa at 20°C:	Not available
Vapor density:	Not available
Density/Relative density (water = 1):	Not available
Solubility(ies):	Not available
Partition coefficient: n-octanol/water:	Not available
Auto-ignition temperature:	Not available
Decomposition temperature:	Not available
Viscosity:	Not available
Other information:	Voltage 3.7 V; Electric capacity 450 mAh

### 10. Stability and Reactivity

#### Reactivity:

No data available.

#### Chemical stability:

Stable.

#### Possibility of hazardous reactions:

No data available.

#### Conditions to Avoid:

Flames, sparks, and other sources of ignition, incompatible materials.

#### Incompatibilities materials:

Oxidizing agents, acid, base.

#### Hazardous decomposition products:

Carbon monoxide, carbon dioxide, lithium oxide fumes.





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### 11. Toxicological Information

**Acute Toxicity:**

CAS No.	LC50/LD50
7429-90-5	No data available.
7440-50-8	No data available.
7440-02-0	LD50 Rat (oral) >= 5000 mg/kg
12190-79-3	No data available.
7782-42-5	No data available.
24937-79-9	No data available.
21324-40-3	No data available.

**Skin corrosion/irritation:**

No data available.

**Serious eye damage/irritation:**

No data available.

**Respiratory or Skin sensitization:**

No data available.

**Germ Cell mutagenicity:**

No data available.

**Carcinogenicity:**

No data available.

**Reproductive toxicity:**

No data available.

**Specific target organ toxicity-Single exposure:**

No data available.

**Specific target organ toxicity-Repeated exposure:**

No data available.

**Aspiration hazard:**

No data available.

**Information on the likely routes of exposure:**

No data available.

**Eye:**

No data available.

**Skin:**

No data available.

**Ingestion:**

No data available.

**Inhalation:**

No data available.



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### 12. Ecological Information

**Ecological Toxicity:**

No data available.

**Persistence and degradability:**

No data available.

**Bioaccumulative Potential:**

No data available.

**Mobility in Soil:**

No data available.

**Other adverse effects:**

No data available.

### 13. Disposal Considerations

**Disposal methods:**

**Recommendation:**

Consult state, local or national regulations to ensure proper disposal.

**Uncleaned packaging:**

**Recommendation:**

Disposal must be made according to official regulations.

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### 14. Transport Information

<b>UN Number</b>	
IATA	UN3480
IMDG	UN3480
Model Regulation	UN3480
<b>UN Proper shipping name</b>	
IATA	Lithium ion batteries
IMDG	LITHIUM ION BATTERIES
Model Regulation	LITHIUM ION BATTERIES
<b>Transport hazard class(es)</b>	
IATA	9
IMDG	9
Model Regulation	9
<b>Packing group</b>	
IATA	N/A
IMDG	N/A
Model Regulation	N/A
<b>Packaging Sign</b>	
IATA	N/A
IMDG	N/A
Model Regulation	N/A
<b>Environmental hazards</b>	
Marine pollutant:	No
<b>Special precautions for user</b>	Not applicable.

#### Transport information:

The Polymer lithium ion battery has passed the test UN38.3 according to the report ID: I12012254021D.

According to the Packaging Instruction 965 section II of IATA DGR 58th Edition for transportation.

According to the special provision 188 of IMDG (37-14) or the Recommendations On The Transport Of Dangerous Goods-Model Regulations (19th). The products are not subject to dangerous goods.

Separate batteries to prevent short-circuiting, and they should be packed in strong package during transport. Lithium cell or battery should incorporate a safety venting device or be designed to prevent a violent rupture under normal transport conditions. Keep away from high temperature and open flames.

Lithium ion cells and batteries must be offered for transport at a state of charge (SoC) not exceeding 30% of their rated design capacity from 1. April 2016.

#### Transport Fashion:

By air, by sea, by railway, by road.



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### 15. Regulatory Information

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

CAS No.	TSCA	IECSC	DSL/NDSL	EINECS/ ELINCS/ NLP
7429-90-5	Listed	Listed	Listed DSL	Listed
7440-50-8	Listed	Listed	Listed DSL	Listed
7440-02-0	Listed	Listed	Listed DSL	Listed
12190-79-3	Listed	Listed	Listed DSL	Listed
7782-42-5	Listed	Listed	Listed DSL	Listed
24937-79-9	Listed	Listed	Listed DSL	Listed
21324-40-3	Listed	Listed	Listed DSL	Listed

### 16. Other Information

**Notice to reader:**

To the best of our knowledge, the information contained herein is accurate. However, neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

**Other Information:**

- CAS: (Chemical Abstracts Service);
- EC: (European Commission);
- ACGIH: (American Conference of Governmental Industrial Hygienists);
- NIOSH: (US National Institute for Occupational Safety and Health);
- OSHA: (US Occupational Safety and Health);
- TLV: (Threshold Limit Value)
- TWA: (Time Weighted Average);
- STEL: (Short Term Exposure Limit);
- PEL: (Permissible Exposure Level);
- REL: (Recommended Exposure Limit);
- PC-STEL: (Permissible concentration-time weighted average);
- PC-TWA: (Permissible concentration-short time exposure limit);
- LC50: (Lethal concentration, 50 percent kill);
- LD50: (Lethal dose, 50 percent kill);
- IARC: (International Agency for Research on Cancer);
- EC50: (Median effective concentration);
- BCF: (Bioconcentration Factor);
- BOD: (Biochemical oxygen demand);



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NOEC: (No observed effect concentration);

NTP: (US National Toxicology Program);

RTECS: (Registry of Toxic Effects of Chemical Substances);

IATA: (International Air Transport Association);

IMDG: (International Maritime Dangerous Goods);

TDG: (Recommendations on the TRANSPORT OF DANGEROUS GOODS Model Regulations);

TOC: (Total Organic Carbon);

TSCA: (Toxic Substances Control Act of USA);

DSL: (the Domestic Substances List of Canada);

NDSL: (the Non-domestic Substances List of Canada)