

Creation date: 28/07/2021

Revision date: 1/1/22

Revision No: 1

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1 Product Identification

Product Name: Black mass (NMC)
Product Description: Lithium nickel manganese cobalt oxide powder from Li-ion battery recycling

1.2 Relevant identified uses of the substance of mixture and uses advised against

Recommended Use: Industrial use
Uses advised against: None

1.3 Details of the supplier of the safety data sheet

Company: LIBATT RECYCLING LIMITED

Email address: steve@recyclusgroup.com

1.4 Emergency Telephone number

STEVE ANDREW - +44 (0) 7521053375

SA 1/1/22

SECTION 2: HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

Lithium nickel cobalt manganese oxide

Weight: 30-50%

CAS No: 346417-97-8

Classification according to Regulation (EC) No 1272/2008:

Skin sensitization (Category 1), H317

Carcinogenicity (Category 2), H351

Copper

Weight: <5%

CAS No: 7440-50-8

Classification according to Regulation (EC) No 1272/2008:

Flammable solids (Category 1), H228

Short-term (acute) aquatic hazard (Category 1), H400

Long-term (chronic) aquatic hazard (Category 1), H410

SAFETY DATA SHEET

Creation date: 30/07/2021

Revision date:

Revision No:

Aluminium

Weight: <10%

CAS No: 7429-90-5

Classification according to Regulation (EC) No 1272/2008:

Flammable solids (Category 1), H228

In contact with water releases flammable gases (Category 2), H261

Graphite, natural

Weight: 25-40%

CAS No: 7782-42-5

Not a hazardous substance or mixture according to Regulation (EC) No 1272/2008

Ethylene carbonate

Weight: <5%

CAS No: 96-49-1

Classification according to Regulation (EC) No 1272/2008:

Acute toxicity, Oral (Category 4), H302

Eye irritation (Category 2), H319

Specific target organ toxicity - repeated exposure, Oral (Category 2), Kidney, H373

Dimethyl carbonate

Weight: <5%

CAS No: 616-38-6

Classification according to Regulation (EC) No 1272/2008:

Flammable liquids (Category 2), H225

Diethyl carbonate

Weight: <5%

CAS No: 105-58-8

Classification according to Regulation (EC) No 1272/2008:

Flammable liquids (Category 3), H226

Ethyl methyl carbonate

Weight: <5%

CAS No: 623-53-0

Classification according to Regulation (EC) No 1272/2008:

Flammable liquids (Category 2), H225

SAFETY DATA SHEET

Creation date: 30/07/2021

Revision date:

Revision No:

2.2 Label Elements



Signal words:

Danger

Hazard statements:

- H228 Flammable solid.
- H261 In contact with water releases flammable gases.
- H317 May cause an allergic skin reaction.
- H319 Causes serious eye irritation.
- H351 Suspected of causing cancer.
- H373 May cause damage to organs through prolonged or repeated exposure.
- H400 Very toxic to aquatic life
- H410 Very toxic to aquatic life with long lasting effects.

Precautionary statements:

- P201 Obtain special instructions before use.
- P202 Do not handle until all safety precautions have been read and understood.
- P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
- P233 Keep container tightly closed.
- P260 Do not breathe dust/fume/gas/mist/vapours/spray
- P271 Use only outdoors or in a well-ventilated area
- P272 Contaminated work clothing should not be allowed out of the workplace
- P280 Wear protective gloves.
- P301 + P312 + P330 IF SWALLOWED: Call a POISON CENTER/ doctor if you feel unwell. Rinse mouth.
- P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower.
- P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- P302 + P352 IF ON SKIN: Wash with plenty of water.
- P308 + P313 IF exposed or concerned: Get medical advice/ attention.
- P314 Get medical advice/ attention if you feel unwell.
- P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
- P403 + P235 Store in a well-ventilated place. Keep cool.
- P501 Dispose of contents/ container to an approved waste disposal plant.

SAFETY DATA SHEET

Creation date: 30/07/2021

Revision date:

Revision No:

2.3 Other Hazards

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Not applicable

3.2 Mixtures

Component	CAS No.	EC No.	Weight %	CLP Classification – Regulation (EC) No 1272/2008
Lithium nickel cobalt manganese oxide	346417-97-8	620-032-4	30-50%	Skin sensitization (Category 1), H317
Copper	7440-50-8	231-159-6	<5%	Flammable solids (Category 1), H228 Short-term (acute) aquatic hazard (Category 1), H400 Long-term (chronic) aquatic hazard (Category 1), H410
Aluminium	7429-90-5	231-072-3	<10%	Flammable solids (Category 1), H228 In contact with water releases flammable gases (Category 2), H261
Graphite, natural	7782-42-5	231-955-3	25-40%	
Ethylene carbonate	96-49-1	202-510-0	<5%	Acute toxicity, Oral (Category 4), H302 Eye irritation (Category 2), H319 Specific target organ toxicity - repeated exposure, Oral (Category 2), Kidney, H373
Dimethyl carbonate	616-38-6	210-478-4	<5%	Flammable liquids (Category 2), H225
Diethyl carbonate	105-58-8	203-311-1	<5%	Flammable liquids (Category 3), H226
Ethyl methyl carbonate	623-53-0	433-480-9	<5%	Flammable liquids (Category 2), H225

SECTION 4: FIRST AID MEASURES

4.1 Description of first aid measures

General Advice

Consult a doctor. Show this safety data sheet to the doctor in attendance.

Eye Contact

Rinse thoroughly with plenty of water for at least 15 minutes and consult a doctor.

Skin Contact

Rinse off with water and soap.

Ingestion

Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a doctor.

SAFETY DATA SHEET

Creation date: 30/07/2021

Inhalation

Protection of first aiders

Revision date:

If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a doctor.

Revision No:

4.2 Most important symptoms and effects (acute and delayed)

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed

Notes to medical staff

Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

Specific treatments

No specific treatments

SECTION 5: FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable Extinguishing Media

Use fire-fighting measures that suit the surrounding fire. Dry chemical, CO₂, water spray or regular foam.

Extinguishing media which must not be used for safety reasons

None.

5.2 Special hazards arising from the substance or mixture

In case of fire toxic gases/vapours may be released.

5.3 Advice for firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Wear protective equipment: gloves and protective goggles. Keep unprotected persons away. Ensure adequate ventilation or use proper respiratory protection.

6.2 Environmental precautions

Prevent spreading in sewers. Prevent soil and water pollution. Do not allow uncontrolled leakage of product into the environment.

SAFETY DATA SHEET

Creation date: 30/07/2021

Revision date:

Revision No:

6.3 Methods and material for containment and cleaning up

Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).

Dispose contaminated material as waste according to item 13.

Ensure adequate ventilation or use proper respiratory protection.

6.4 Reference to other sections

Refer to section 1 for emergency contact information.

Refer to protective measures listed in Sections 8 & 13.

SECTION 7: HANDLING AND STORAGE

7.1 Precautions for safe handling

Advice on safe handling

Avoid formation of dust and aerosols.

Advice on protection against fire and explosion

Provide appropriate exhaust ventilation at places where dust is formed. Keep away from sources of ignition - No smoking. Take measures to prevent the build up of electrostatic charge.

Hygiene measures

Handle in accordance with good industrial hygiene and safety practices. Keep away from food, drink and animal feeding stuffs. Do not eat, drink or smoke when using this product. Remove and wash contaminated clothing before re-use. Wash hands before breaks and at the end of the working day.

7.2 Conditions for safe storage (including any incompatibilities)

Keep away from strong acids and strong oxidants.

Keep containers tightly closed in a dry, cool and well-ventilated place.

7.3 Specific end use(s)

No additional information available.

SAFETY DATA SHEET

Creation date: 30/07/2021

Revision date:

Revision No:

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION**8.1 Control parameters**

Component	CAS No.	Value	Control parameters	Basis	Remarks
Lithium nickel cobalt manganese oxide	346417-97-8	TWA	0.1 mg/m ³	UK. EH40 WEL – Workplace Exposure Limits	(1)
Copper	7440-50-8	TWA	0.2 mg/m ³	UK. EH40 WEL – Workplace Exposure Limits	
		TWA	1 mg/m ³	UK. EH40 WEL – Workplace Exposure Limits	
		STEL	2 mg/m ³	UK. EH40 WEL – Workplace Exposure Limits	
Aluminium	7429-90-5	TWA	10 mg/m ³	UK. EH40 WEL – Workplace Exposure Limits	(2)
		TWA	4 mg/m ³	UK. EH40 WEL – Workplace Exposure Limits	(2)
Graphite, natural	7782-42-5	TWA	10 mg/m ³	UK. EH40 WEL – Workplace Exposure Limits	
		TWA	10 mg/m ³	UK. EH40 WEL – Workplace Exposure Limits	
Ethylene carbonate	96-49-1	Contains no substances with occupational exposure limit values.			
Dimethyl carbonate	616-38-6	Contains no substances with occupational exposure limit values.			
Diethyl carbonate	105-58-8	Contains no substances with occupational exposure limit values.			
Ethyl methyl carbonate	623-53-0	Contains no substances with occupational exposure limit values.			

Remarks

(1) Substances that can cause occupational asthma (also known as asthmagens and respiratory sensitisers) can induce a state of specific airway hyper-responsiveness via an immunological irritant or other mechanism. Once the airways have become hyper-responsive, further exposure to the substance, sometimes even in tiny quantities, may cause respiratory symptoms. These symptoms can range in severity from a runny nose to asthma. Not all workers who are exposed to a sensitiser will become hyper-responsive and it is impossible to identify in advance those who are likely to become hyper-responsive. Substances that can cause occupational asthma should be distinguished from substances which may trigger the symptoms of asthma in people with pre-existing airway hyper-responsiveness, but which do not include the disease themselves. The latter substances are not classified as asthmagens or respiratory sensitisers. Further information can be found in the HSE publication *Asthmagen? Critical assessments of the evidence for agents implicated in occupational asthma*.

Wherever it is reasonably practicable, exposure to substances that can cause occupational asthma should be prevented. Where this is not possible, the primary aim is to apply adequate standards of control to prevent workers from becoming hyper-responsive. For substances that can cause occupational asthma, COSHH requires that exposure be reduced to as low as is reasonably practicable. Activities giving rise to short-term peak concentrations should receive particular attention when risk management is being considered. Health surveillance is appropriate for all employees exposed or liable to be

SAFETY DATA SHEET

Creation date: 30/07/2021

Revision date:

Revision No:

exposed to a substance which may cause occupational asthma and there should be appropriate consultation with an occupational health professional over the degree of risk and level of surveillance.

Capable of causing occupational asthma.

Capable of causing cancer and/or heritable genetic damage.

Where no specific short-term exposure limit is listed, a figure three times the long-term exposure limit should be used.

Carcinogenic applies for cobalt dichloride and sulphate.

The 'Sen' notation in the list of WELs has been assigned only to those substances which may cause occupational asthma in the categories shown in Table 1. It should be remembered that other substances not in these tables may cause occupational asthma. HSE's asthma web pages (www.hse.gov.uk/asthma) provide further information.

(2) For the purposes of these limits, respirable dust and inhalable dust are those fractions of airborne dust which will be collected when sampling is undertaken in accordance with the methods described in MDHS14/4 General methods for sampling and gravimetric analysis or respirable, thoracic and inhalable aerosols.

The COSHH definition of a substance hazardous to health includes dust of any kind when present at a concentration in air equal to or greater than 10 mg.m⁻³ 8-hour TWA of inhalable dust or 4 mg.m⁻³ 8-hour TWA of respirable dust.

This means that any dust will be subject to COSHH if people are exposed to dust above these levels. Some dusts have been assigned specific WELs and exposure to these must comply with the appropriate limits.

Most industrial dusts contain particles of a wide range of sizes. The behaviour, deposition and fate of any particular particle after entry into the human respiratory system, and the body response that it elicits, depend on the nature and size of the particle. HSE distinguishes two size fractions for limit-setting purposes termed 'inhalable' and 'respirable'.

Inhalable dust approximates to the fraction of airborne material that enters the nose and mouth during breathing and is therefore available for deposition in the respiratory tract. Respirable dust approximates to the fraction that penetrates to the gas exchange region of the lung. Fuller definitions and explanatory material are given in MDHS14/4. Where dusts contain components that have their own assigned WEL, all the relevant limits should be complied with.

Where no specific short-term exposure limit is listed, a figure three times the long-term exposure limit should be used.

8.2 Exposure controls

Personal Protective Equipment

Eye/face protection

Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

SAFETY DATA SHEET

Creation date: 30/07/2021

Revision date:

Revision No:

Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

The selected protective gloves have to satisfy the specifications of Regulation (EU) 2016/425 and the standard EN 374 derived from it.

Full contact

Material: Nitrile rubber

Minimum layer thickness: 0.11 mm

Break through time: 480 min

Material tested: Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact

Material: Nitrile rubber

Minimum layer thickness: 0.11 mm

Break through time: 480 min

Material tested: Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374

If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the EC approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection

Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use a full face article respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure

Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

SAFETY DATA SHEET

Creation date: 30/07/2021

Revision date:

Revision No:

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance	Crystalline solid
Physical state	Solid
Odour	Detectable organic odour
Odour Threshold	Not determined
pH	Not determined
Melting point/range	Not determined
Softening point	Not determined
Boiling point/range	Not determined
Flash point	Not determined
Evaporation rate	Not determined
Flammability (solid/gas)	Not determined
Explosion limits	Not determined
Vapour pressure	Not determined
Vapour density	Not determined
Specific gravity/density	Not determined
Bulk density	Not determined
Water solubility	Insoluble in cold water
Solubility in other solvents	Not determined
Partition coefficient (n-octanol/water)	Not determined
Autoignition temperature	Not determined
Decomposition temperature	Not determined
Viscosity	Not determined
Explosive properties	Not determined
Oxidising properties	Not determined

9.2 Other information

None

SECTION 10: STABILITY AND REACTIVITY

10.1 Reactivity

Reacts exothermically with (some) acids: release of highly flammable gases/vapours.

10.2 Chemical stability

Stable under normal conditions.

10.3 Possibility of hazardous reactions

No information available.

10.4 Conditions to avoid

No information available.

SAFETY DATA SHEET

Creation date: 30/07/2021

Revision date:

Revision No:

e) Germ cell mutagenicity

f) Carcinogenicity

g) Reproductive toxicity

Data for the components

Component	Germ cell mutagenicity	Carcinogenicity	Reproductive toxicity
Lithium nickel cobalt manganese oxide	No data available	Suspected of causing cancer. IARC: 2B - Group 2B: Possibly carcinogenic to humans (Lithium nickel manganese cobalt oxide) 1 - Group 1: Carcinogenic to humans (Lithium nickel manganese cobalt oxide) IARC: 2B - Group 2B: Possibly carcinogenic to humans (Lithium nickel manganese cobalt oxide) 1 - Group 1: Carcinogenic to humans (Lithium nickel manganese cobalt oxide)	No data available
Copper	No data available	IARC: No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.	No data available
Aluminium	No data available		No data available
Graphite, natural	No data available Ames test S. typhimurium Result: negative		No data available
Ethylene carbonate	No data available In vitro mammalian cell gene mutation test mouse lymphoma cells Result: negative		No data available
Dimethyl carbonate	Chromosome aberration test in vitro lymphocyte Result: negative		No data available
Diethyl carbonate	No data available Salmonella typhimurium Result: negative		No data available
Ethyl methyl carbonate	Ames test Escherichia coli/Salmonella typhimurium Result: negative Mutagenicity (mammal cell test): chromosome aberration. Human lymphocytes Result: negative		No data available

SAFETY DATA SHEET

Creation date: 30/07/2021

Revision date:

Revision No:

- h) STOT – single exposure
- i) STOT – repeated exposure
- j) Aspiration hazard

Data for the components

Component	STOT – single exposure	STOT – repeated exposure	Aspiration hazard
Lithium nickel cobalt manganese oxide	No data available	No data available	No data available
Copper	No data available	No data available	No data available
Aluminium	No data available	No data available	No data available
Graphite, natural	No data available	No data available	No data available
Ethylene carbonate	No data available	Oral - May cause damage to organs through prolonged or repeated exposure. - Kidney	No data available
Dimethyl carbonate	No data available	No data available	No data available
Diethyl carbonate	No data available	No data available	No data available
Ethyl methyl carbonate	No data available	No data available	No data available

11.2 Additional information

Lithium nickel cobalt manganese oxide

RTECS: Not available

Large doses of lithium ion have caused dizziness and prostration, and can cause kidney damage if sodium intake is limited. Dehydration, weight loss, dermatological effects, and thyroid disturbances have been reported. Central nervous system effects that include slurred speech, blurred vision, sensory loss, ataxia, and convulsions may occur. Diarrhea, vomiting, and neuromuscular effects such as tremor, clonus, and hyperactive reflexes may occur as a result of repeated exposure to lithium ion.

Copper

RTECS: GL5325000

Symptoms of systemic copper poisoning may include: capillary damage, headache, cold sweat, weak pulse, and kidney and liver damage, central nervous system excitation followed by depression, jaundice, convulsions, paralysis, and coma. Death may occur from shock or renal failure. Chronic copper poisoning is typified by hepatic cirrhosis, brain damage and demyelination, kidney defects, and copper deposition in the cornea as exemplified by humans with Wilson's disease. It has also been reported that copper poisoning has lead to hemolytic anemia and accelerates arteriosclerosis., Damage to the lungs., Vomiting, Diarrhea, Abdominal pain, Blood disorders.

Aluminium

RTECS: BD0330000

Graphite, natural

Repeated dose toxicity - Rat - male - Feed - NOAEL (No observed adverse effect level) - 813 mg/kg

SAFETY DATA SHEET

Creation date: 30/07/2021
RTECS: MD9659600

Revision date:

Revision No:

Ethylene carbonate
RTECS: FF9550000

Dimethyl carbonate
RTECS: FG0450000

Diethyl carbonate
Repeated dose toxicity - Mouse - male - Oral - LOAEL (Lowest observed adverse effect level) - 50 mg/kg
RTECS: FF9800000

Ethyl methyl carbonate
Repeated dose toxicity - Rat - male - Oral - 28 d - NOAEL (No observed adverse effect level) - 1,000 mg/kg
Repeated dose toxicity - Rat - female - Oral - 28 d - NOAEL (No observed adverse effect level) - 150 mg/kg
RTECS: Not available
Properties which must be anticipated by analogy: Headache, Drowsiness, Nausea

To the best of our knowledge, the chemical, physical, and toxicological properties of all the components have not been thoroughly investigated.

SECTION 12: ECOLOGICAL INFORMATION

12.1 Toxicity

Lithium nickel cobalt manganese oxide

Toxicity to fish	No data available
Toxicity to daphnia and other aquatic invertebrates	No data available
Toxicity to algae	No data available

Copper

Toxicity to fish	LC50 - Pimephales promelas (fathead minnow) - 0.0094 mg/l - 96 h Remarks: (ECOTOX Database) Static test
Toxicity to daphnia and other aquatic invertebrates	EC50 - Ceriodaphnia dubia (water flea) - 0.0016 mg/l - 48 H Remarks: (ECOTOX Database)
Toxicity to algae	No data available

Aluminium

Toxicity to fish	No data available
Toxicity to daphnia and other aquatic invertebrates	No data available
Toxicity to algae	No data available

SAFETY DATA SHEET

Creation date: 30/07/2021

Revision date:

Revision No:

Graphite, natural

Toxicity to fish

Semi-static test LC50 - Danio rerio (zebra fish) - > 100 mg/l - 96 h (OECD Test Guideline 203)

Toxicity to daphnia and other aquatic invertebrates

Static test EC50 - Daphnia magna (Water flea) - > 100 mg/l - 48 h (OECD Test Guideline 202)

Toxicity to algae

Static test EC50 - Pseudokirchneriella subcapitata - > 100 mg/l - 72 h (OECD Test Guideline 201)

Ethylene carbonate

Toxicity to fish

No data available

Toxicity to daphnia and other aquatic invertebrates

Static test LC50 - Ceriodaphnia dubia (water flea) - 5,900 mg/L - 48 h

Toxicity to algae

No data available

Dimethyl carbonate

Toxicity to fish

Flow-through test LC50 - Danio rerio (zebra fish) - > 100 mg/l - 96 h (OECD Test Guideline 203)

Toxicity to daphnia and other aquatic invertebrates

Static test EC50 - Daphnia magna (Water flea) - > 100 mg/l - 48 h (OECD Test Guideline 202)

Toxicity to algae

Static test EC50 - Pseudokirchneriella subcapitata (green algae) - > 100 mg/l - 72 h (OECD Test Guideline 201)

Diethyl carbonate

Toxicity to fish

No data available

Toxicity to daphnia and other aquatic invertebrates

Immobilization NOEC - Daphnia magna Straus (Water flea) - >= 100 mg/l - 48 h (OECD Test Guideline 202)

Toxicity to algae

Growth inhibition NOEC - Desmodesmus subspicatus (green algae) - >= 100 mg/l - 72 h (OECD Test Guideline 201)

Ethyl methyl carbonate

Toxicity to fish

Semi-static test NOEC - Oncorhynchus mykiss (rainbow trout) - > 100 mg/l - 96 h (Regulation (EC) No. 440/2008, Annex, C.1)

Toxicity to daphnia and other aquatic invertebrates

Static test EC50 - Daphnia magna (Water flea) - > 100 mg/l - 48 h (OECD Test Guideline 202)

Toxicity to algae

Static test ErC50 - Desmodesmus subspicatus (green algae) - > 62 mg/l - 72 h (OECD Test Guideline 201)

Toxicity to bacteria

Cell multiplication inhibition test EC50 - Pseudomonas putida - 760 mg/l - 16 h (ISO 10712)

SAFETY DATA SHEET

Creation date: 30/07/2021

Revision date:

Revision No:

12.2 Persistence and degradability

Lithium nickel cobalt manganese oxide

The methods for determining biodegradability are not applicable to inorganic substances.

Copper

The methods for determining biodegradability are not applicable to inorganic substances.

Aluminium

The methods for determining biodegradability are not applicable to inorganic substances.

Graphite, natural

Biodegradability No data available

Ethylene carbonate

Biodegradability Aerobic - Exposure time 29 d
Result: 86.9 % - Readily biodegradable.
(OECD Test Guideline 301B)

Dimethyl carbonate

Biodegradability Aerobic - Exposure time 28 d
Result: 86 % - Readily biodegradable.
(OECD Test Guideline 301C)

Diethyl carbonate

Biodegradability Result: 75 % - Readily biodegradable.

Ethyl methyl carbonate

Biodegradability Biochemical oxygen demand - Exposure time 28 d
Result: 98 % - Readily biodegradable.
(OECD Test Guideline 301C)

12.3 Bioaccumulative potential

No data available

12.4 Motility in soil

No data available

12.5 Results of PBT and vPvB Assessment

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

12.6 Other adverse effects

No data available

SAFETY DATA SHEET

Creation date: 30/07/2021

Revision date:

Revision No:



SECTION 13: DISPOSAL CONSIDERATIONS**13.1 Waste treatment methods****Product**

Offer surplus and non-recyclable solutions to a licensed disposal company. Waste material must be disposed of in accordance with the Directive on waste 2008/98/EC as well as other national and local regulations. Leave chemicals in original containers. No mixing with other waste. Handle uncleaned containers like the product itself.


Contaminated packaging

Dispose of as unused product.

SECTION 14: TRANSPORT INFORMATION**IMDG/IMO**

14.1 UN Number	3077
14.2 UN proper shipping name	UN 3077, 9, III, MARINE POLLUTANT
14.3 Transport hazard class(es)	9  
14.4 Packing group	III

ADR

14.1 UN Number	3077
14.2 UN proper shipping name	UN 3077 ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S., 9, III, (E)
14.3 Transport hazard class(es)	9 
14.4 Packing group	III


SAFETY DATA SHEET

Creation date: 30/07/2021

Revision date:

Revision No:

IATA

14.1 UN Number	3077
14.2 UN proper shipping name	Not applicable
14.3 Transport hazard class(es)	9 
14.4 Packing group	Not applicable

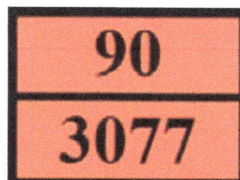
14.5 Environmental hazards

Dangerous for the environment Yes
 Marine pollutant Yes
 Other information None

14.6 Special precautions for user

Overland transport

Classification code (ADR) M7
 Excepted quantities (ADR) E1
 Hazard identification number (Kemler No) 90
 Orange plates



Tunnel restriction code (ADR) E

Transport by sea

No data available

Air transport

No data available

Inland waterway transport

Carriage prohibited (RDN) No

Not subject to ADN No

Rail transport

Carriage prohibited (RID) No

14.7 Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

Not applicable

SAFETY DATA SHEET

Creation date: 30/07/2021

Revision date:

Revision No:

SECTION 15: REGULATORY INFORMATION

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

National legislation

Lithium nickel cobalt manganese oxide

REACH - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, preparations and articles (Annex XVII) ENVIRONMENTAL HAZARDS

Copper

Seveso III: Directive 2012/18/EU of the European Parliament and of the Council on the control of major-accident hazards involving dangerous substances. ENVIRONMENTAL HAZARDS

15.2 Chemical safety assessment

No chemical safety assessment has been carried out.

SECTION 16: OTHER INFORMATION

Full text of H-/EUH- Statements referred to under section 3

- H228 Flammable solid.
- H261 In contact with water releases flammable gases.
- H317 May cause an allergic skin reaction.
- H319 Causes serious eye irritation.
- H351 Suspected of causing cancer.
- H373 May cause damage to organs through prolonged or repeated exposure.
- H400 Very toxic to aquatic life.
- H410 Very toxic to aquatic life with long lasting effects.

Training advice

Chemical hazard awareness training, incorporating labelling, Safety Data Sheets, Personal Protective Equipment and hygiene

Use of personal protective equipment, covering appropriate selection, compatibility, breakthrough thresholds, care, maintenance, fit and standards.

First Aid for chemical exposure, including the use of eye wash and safety showers.

Chemical incident response training.

Creation Date: 30/07/2021

Revision Date:

Revision Summary:

SAFETY DATA SHEET

Creation date: 30/07/2021

Revision date:

Revision No:

This safety data sheet complies with the requirements of Regulation (EC) No. 1907/2006.

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

SAFETY DATA SHEET

Creation date: 30/07/2021

Revision date:

Revision No:

10.5 Incompatible materials

Acids, oxidising agents

10.6 Hazardous decomposition products

Metal oxide fume, hydrogen fluoride

SECTION 11: TOXICOLOGICAL INFORMATION**11.1 Information about toxicological effects****Product information**

- a) Acute toxicity

Data for the components

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
Lithium nickel cobalt manganese oxide	No data available	No data available	No data available
Copper	No data available	No data available	No data available
Aluminium	No data available	No data available	No data available
Graphite, natural	Rat, >2,000 mg/kg	No data available	Rat, 4 h, >2 mg/L
Ethylene carbonate	No data available	Rat, >2,000 mg/kg	Rat, 7 h, >1.268 mg/L
Dimethyl carbonate	Rat, >5,000 mg/kg	Rabbit, >2,000 mg/kg	Rat, 4 h, >5.36 mg/L
Diethyl carbonate	Rat, >4,876 mg/kg	No data available	Rat, 7 h, >1.268 mg/L
Ethyl methyl carbonate	Rat, >5,000 mg/kg	No data available	Rat, 4 h, >17.6 mg/L

- b) Skin corrosion/irritation
 c) Serious eye damage/irritation
 d) Respiratory or skin sensitisation

Data for the components

Component	Skin corrosion/irritation	Serious eye damage/eye irritation	Respiratory or skin sensitisation
Lithium nickel cobalt manganese oxide	No data available	No data available	No data available
Copper	No data available	No data available	No data available
Aluminium	No data available	No data available	No data available
Graphite, natural	Skin – Rabbit Result: No skin irritation	Eyes – Rabbit Result: No eye irritation	Mouse Result: Does not cause skin sensitisation
Ethylene carbonate	Skin – Rabbit Result: No skin irritation, 4 h	Eyes – Rabbit Result: Irritating to eyes	Buehler Test – Guinea pig Result: Does not cause skin sensitisation
Dimethyl carbonate	Skin – Rabbit Result: No skin irritation	Eyes – Rabbit Result: No eye irritation	Freund's complete adjuvant Test – Guinea pig Result: Negative
Diethyl carbonate	Skin – Rabbit Result: No skin irritation	Eyes – Rabbit Result: No eye irritation	Mouse Result: Does not cause skin sensitisation
Ethyl methyl carbonate	Skin – Rabbit Result: Slight irritation, 4 h	Eyes – Rabbit Result: Slight irritation	Magnusson and Kligman – Guinea pig Result: Does not cause skin sensitisation