SAFETY DATA SHEET

BTRYPCK-18V/5.0AH-M-CUBE-BASIC

Version	Revision Date:	SDS Number:	Date of last issue: 13.01.2021
3.0	27.10.2021	6374801-00003	Date of first issue: 21.09.2020

Section 1: Identification

Product name : BTRYPCK-18V/5.0AH-M-CUBE-BASIC

Product code : 5703 450 000

Manufacturer or supplier's details

Company : Wurth NewZealand Ltd

Address : 99 McLauglins Road
Wiri, Auckland 2104

Telephone : +64 9 262 3040

Emergency telephone number : 0800 764 766

E-mail address : prodsafe@wuerth.com

Telefax : +64 9 262 3030

Recommended use of the chemical and restrictions on use

Recommended use : Battery
Article

Section 2: Hazard identification

GHS Classification

Not a hazardous substance or mixture.

GHS label elements

Not a hazardous substance or mixture.

Other hazards which do not result in classification

None known.

Section 3: Composition/information on ingredients

Substance / Mixture : Mixture

Components

Chemical name	CAS-No.	Concentration (% w/w)
Lithium nickel oxide	12325-84-7	>= 30 -< 60
Graphite	7782-42-5	>= 10 -< 30
Copper	7440-50-8	>= 10 -< 30
Aluminium	7429-90-5	< 10
Cobalt lithium dioxide	12190-79-3	>= 1 -< 10
methyl propionate	554-12-1	>= 3 -< 10
Lithium hexafluorophosphate	21324-40-3	>= 1 -< 3

4-Fluoro-1,3-dioxolan-2-one	114435-02-8	>= 1 -< 10
Nickel	7440-02-0	< 1

Section 4: First-aid measures

If inhaled	:	Not applicable
In case of skin contact	:	Not applicable
In case of eye contact	:	Not applicable
If swallowed	:	Not applicable
Most important symptoms and effects, both acute and delayed	:	None known.
Protection of first-aiders	:	No special precautions are necessary for first aid responders.
Notes to physician	:	Treat symptomatically and supportively.

Section 5: Fire-fighting measures

Suitable extinguishing media	:	Water spray Alcohol-resistant foam Carbon dioxide (CO2) Dry chemical
Unsuitable extinguishing media	:	None known.
Specific hazards during fire-fighting	:	Exposure to combustion products may be a hazard to health.
Hazardous combustion products	:	Metal oxides Nickel compounds Carbon oxides Cobalt compounds Fluorine compounds Oxides of phosphorus
Specific extinguishing methods	:	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. Use water spray to cool unopened containers. Remove undamaged containers from fire area if it is safe to do so. Evacuate area.
Special protective equipment for firefighters	:	Wear self-contained breathing apparatus for firefighting if necessary. Use personal protective equipment.

Section 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures	:	Not applicable
Environmental precautions	:	No special environmental precautions required.
Methods and materials for containment and cleaning up	:	Not applicable

Section 7: Handling and storage

Technical measures	:	Not applicable
Local/Total ventilation	:	Not applicable
Advice on safe handling	:	Not applicable
Hygiene measures	:	When using do not eat, drink or smoke.
Conditions for safe storage	:	Store in accordance with the particular national regulations. Ensure proper labeling
Materials to avoid	:	Do not store with the following product types: Strong oxidizing agents
Recommended storage temperature	:	< 125 °C

Section 8: Exposure controls/personal protection

Components with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
Lithium nickel oxide	12325-84-7	WES-TWA	0.02 mg/m3 (Nickel)	NZ OEL
	Further information: Suspected carcinogen, Sensitiser			
		WES-TWA (Respirable dust)	0.005 mg/m3 (Nickel)	NZ OEL
	Further information: Suspected carcinogen, Sensitiser			
Graphite	7782-42-5	WES-TWA (Respirable dust)	3 mg/m3	NZ OEL
		TWA (Respirable particulate matter)	2 mg/m3	ACGIH
Copper	7440-50-8	WES-TWA (Respirable	0.01 mg/m3 (Copper)	NZ OEL

		dust)		
	Further information: Skin sensitiser			
		TWA (Dust and mist)	1 mg/m3 (Copper)	ACGIH
		TWA (Fumes)	0.2 mg/m3 (Copper)	ACGIH
Aluminium	7429-90-5	WES-TWA (inhalable dust)	10 mg/m3 (Aluminium)	NZ OEL
		TWA (Respirable particulate matter)	1 mg/m3 (Aluminium)	ACGIH
Cobalt lithium dioxide	12190-79-3	TWA (Inhalable particulate matter)	0.02 mg/m3 (Cobalt)	ACGIH
Lithium hexafluorophosphate	21324-40-3	WES-TWA	2.5 mg/m3 (Fluorine)	NZ OEL
	Further information: Exposure can also be estimated by biological monitoring			
		TWA	2.5 mg/m3 (Fluorine)	ACGIH
Nickel	7440-02-0	WES-TWA (Respirable dust)	0.005 mg/m3	NZ OEL
	Further information: Suspected carcinogen, Sensitiser			
		TWA (Inhalable particulate matter)	1.5 mg/m3	ACGIH

Occupational exposure limits of decomposition products

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
Phosphoric acid	7664-38-2	WES-TWA	1 mg/m3	NZ OEL
		TWA	1 mg/m3	ACGIH
		STEL	3 mg/m3	ACGIH
Hydrofluoric acid	7664-39-3	WES-Ceiling	3 ppm 2.6 mg/m3 (Fluorine)	NZ OEL
		TWA	0.5 ppm (Fluorine)	ACGIH
		C	2 ppm (Fluorine)	ACGIH
Lithium fluoride	7789-24-4	WES-TWA	2.5 mg/m3 (Fluorine)	NZ OEL
	Further information: Exposure can also be estimated by biological monitoring			
		TWA	2.5 mg/m3 (Fluorine)	ACGIH

Biological occupational exposure limits

Components	CAS-No.	Control parameters	Biological specimen	Sampling time	Permissible concentration	Basis
Lithium hexafluorophosphate	21324-40-3	Fluoride (Fluorine)	Urine	Prior to shift	2 mg/l	NZ BEI
		Fluoride (Fluorine)	Urine	End of shift	3 mg/l	NZ BEI
		Fluoride (Fluorine)	Urine	Prior to shift (16 hours after exposure ceases)	2 mg/l	ACGIH BEI
		Fluoride (Fluorine)	Urine	End of shift (As soon as possible after exposure ceases)	3 mg/l	ACGIH BEI
Cobalt lithium dioxide	12190-79-3	Cobalt (Cobalt)	Urine	End of shift at end of work-week	15 µg/l	ACGIH BEI
Nickel	7440-02-0	Nickel (Nickel)	Urine	End of shift at end of work-week	5 µg/l	ACGIH BEI
		Nickel (Nickel)	Urine	End of shift at end of work-week	30 µg/l	ACGIH BEI
Lithium nickel oxide	12325-84-7	Nickel (Nickel)	Urine	End of shift at end of work-week	5 µg/l	ACGIH BEI
		Nickel (Nickel)	Urine	End of shift at end of work-week	30 µg/l	ACGIH BEI

Engineering measures : Not applicable

Personal protective equipment

Respiratory protection : If adequate local exhaust ventilation is not available or exposure assessment demonstrates exposures outside the recommended guidelines, use respiratory protection.

Filter type	:	Combined particulates, acidic gas/vapour and organic vapour type

Hand protection

Remarks	:	not required
Eye protection	:	Not applicable
Skin and body protection	:	Not applicable

Section 9: Physical and chemical properties

Appearance	:	solid
Colour	:	No data available
Odour	:	odourless
Odour Threshold	:	No data available
pH	:	No data available
Melting point/freezing point	:	No data available
Initial boiling point and boiling range	:	No data available
Flash point	:	Not applicable
Evaporation rate	:	Not applicable
Flammability (solid, gas)	:	Not classified as a flammability hazard
Upper explosion limit / Upper flammability limit	:	No data available
Lower explosion limit / Lower flammability limit	:	No data available
Vapour pressure	:	Not applicable
Relative vapour density	:	Not applicable
Density	:	No data available
Solubility(ies)		
Water solubility	:	insoluble
Partition coefficient: n-	:	Not applicable

octanol/water

Auto-ignition temperature	:	No data available
Decomposition temperature	:	No data available
Viscosity		
Viscosity, kinematic	:	Not applicable
Explosive properties	:	Not explosive
Oxidizing properties	:	The substance or mixture is not classified as oxidizing.
Particle size	:	No data available

Section 10: Stability and reactivity

Reactivity	:	Not classified as a reactivity hazard.
Chemical stability	:	Stable under normal conditions.
Possibility of hazardous reactions	:	Can react with strong oxidizing agents. Hazardous decomposition products will be formed upon contact with water or humid air.
Conditions to avoid	:	Exposure to moisture
Incompatible materials	:	Oxidizing agents Water

Hazardous decomposition products

Contact with water or humid air	:	Phosphoric acid Hydrofluoric acid Lithium fluoride

Section 11: Toxicological information

Exposure routes	:	Skin contact Ingestion Eye contact

Acute toxicity

Not classified based on available information.

Product:

Acute oral toxicity	:	Assessment: The substance or mixture has no acute oral toxicity Remarks: Based on bioavailability assessment according to 1.3.2.4.5 UN GHS/CLP article 12
Acute inhalation toxicity	:	Assessment: The substance or mixture has no acute inhala-

tion toxicity, Not corrosive to the respiratory tract
Remarks: Based on bioavailability assessment according to 1.3.2.4.5 UN GHS/CLP article 12

Components:

Lithium nickel oxide:

Acute oral toxicity : LD50 (Rat): > 300 mg/kg
Remarks: Based on data from similar materials

Acute inhalation toxicity : Assessment: Corrosive to the respiratory tract.

Acute dermal toxicity : LD50 (Rat): > 2,000 mg/kg
Remarks: Based on data from similar materials

Graphite:

Acute oral toxicity : LD50 (Rat): > 2,000 mg/kg
Method: OECD Test Guideline 423
Assessment: The substance or mixture has no acute oral toxicity

Acute inhalation toxicity : LC50 (Rat): > 2 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: OECD Test Guideline 403

Copper:

Acute oral toxicity : LD50 (Rat): > 2,500 mg/kg
Method: OECD Test Guideline 423
Assessment: The substance or mixture has no acute oral toxicity
Remarks: Based on data from similar materials

Acute inhalation toxicity : LC50 (Rat): > 5.11 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: OECD Test Guideline 436

Acute dermal toxicity : LD50 (Rat): > 2,000 mg/kg
Method: OECD Test Guideline 402
Assessment: The substance or mixture has no acute dermal toxicity
Remarks: Based on data from similar materials

Aluminium:

Acute oral toxicity : LD50 (Rat): > 5,000 mg/kg
Method: OECD Test Guideline 401
Remarks: Based on data from similar materials

Acute inhalation toxicity : LC50 (Rat): > 0.888 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist

Cobalt lithium dioxide:

Acute oral toxicity	:	LD50 (Rat): > 5,000 mg/kg Method: OECD Test Guideline 425
Acute dermal toxicity	:	LD50 (Rat): > 2,000 mg/kg Method: OECD Test Guideline 402 Remarks: Based on data from similar materials

methyl propionate:

Acute oral toxicity	:	LD50 (Rabbit): 2,002 mg/kg
Acute inhalation toxicity	:	LC50 (Rat): > 22.7 mg/l Exposure time: 4 h Test atmosphere: vapour Method: Directive 67/548/EEC, Annex V, B.2.
Acute dermal toxicity	:	LD50 (Rabbit): > 5,000 mg/kg

Lithium hexafluorophosphate:

Acute oral toxicity	:	LD50 (Rat): > 50 - 300 mg/kg Method: OECD Test Guideline 423
Acute inhalation toxicity	:	Assessment: Corrosive to the respiratory tract.

4-Fluoro-1,3-dioxolan-2-one:

Acute oral toxicity	:	LD50 (Rat, female): 500 mg/kg Method: OECD Test Guideline 423
Acute dermal toxicity	:	LD50 (Rat): > 2,000 mg/kg Method: OECD Test Guideline 402

Nickel:

Acute oral toxicity	:	LD50 (Rat): > 5,000 mg/kg Method: OECD Test Guideline 401
Acute inhalation toxicity	:	LC0 (Rat): 10.2 mg/l Exposure time: 1 h Test atmosphere: dust/mist

Skin corrosion/irritation

Not classified based on available information.

Product:

Result	:	No skin irritation
Remarks	:	Based on bioavailability assessment according to 1.3.2.4.5 UN GHS/CLP article 12

Components:

Lithium nickel oxide:

Species	:	Rabbit
Method	:	OECD Test Guideline 404
Result	:	Corrosive after 3 minutes to 1 hour of exposure
Remarks	:	Based on data from similar materials

Graphite:

Species	:	Rabbit
Method	:	OECD Test Guideline 404
Result	:	No skin irritation

Copper:

Species	:	Rabbit
Method	:	OECD Test Guideline 404
Result	:	No skin irritation

Aluminium:

Species	:	Rabbit
Method	:	OECD Test Guideline 404
Result	:	No skin irritation
Remarks	:	Based on data from similar materials

Cobalt lithium dioxide:

Species	:	reconstructed human epidermis (RhE)
Method	:	OECD Test Guideline 439
Result	:	No skin irritation

methyl propionate:

Species	:	reconstructed human epidermis (RhE)
Method	:	OECD Test Guideline 439
Result	:	No skin irritation

Lithium hexafluorophosphate:

Species	:	reconstructed human epidermis (RhE)
Method	:	OECD Test Guideline 431
Result	:	Corrosive after 3 minutes or less of exposure

4-Fluoro-1,3-dioxolan-2-one:

Species	:	reconstructed human epidermis (RhE)
Species	:	reconstructed human epidermis (RhE)
Method	:	OECD Test Guideline 439
Result	:	Skin irritation

Nickel:

Species	:	Rabbit
Method	:	OECD Test Guideline 404
Result	:	No skin irritation

Serious eye damage/eye irritation

Not classified based on available information.

Product:

Result	:	No eye irritation
Remarks	:	Based on bioavailability assessment according to 1.3.2.4.5 UN GHS/CLP article 12

Components:

Lithium nickel oxide:

Result	:	Irreversible effects on the eye
Remarks	:	Based on skin corrosivity.

Graphite:

Species	:	Rabbit
Result	:	No eye irritation
Method	:	OECD Test Guideline 405

Copper:

Species	:	Rabbit
Result	:	No eye irritation
Method	:	OECD Test Guideline 405

Aluminium:

Species	:	Rabbit
Result	:	No eye irritation
Remarks	:	Based on data from similar materials

Cobalt lithium dioxide:

Species	:	Rabbit
Result	:	No eye irritation
Method	:	OECD Test Guideline 405

methyl propionate:

Species	:	Chicken eye
Method	:	OECD Test Guideline 438
Result	:	Irreversible effects on the eye

Lithium hexafluorophosphate:

Result	:	Irreversible effects on the eye
Remarks	:	Based on skin corrosivity.

4-Fluoro-1,3-dioxolan-2-one:

Species	:	Rabbit
Result	:	Irritation to eyes, reversing within 21 days
Method	:	OECD Test Guideline 405
Remarks	:	Based on data from similar materials

Nickel:

Species	:	Rabbit
Result	:	No eye irritation
Method	:	OECD Test Guideline 405
Remarks	:	Based on data from similar materials

Respiratory or skin sensitisation

Skin sensitisation

Not classified based on available information.

Respiratory sensitisation

Not classified based on available information.

Product:

Assessment	:	Does not cause respiratory sensitisation.
Remarks	:	Based on bioavailability assessment according to 1.3.2.4.5 UN GHS/CLP article 12
	:	Does not cause skin sensitisation.
Remarks	:	Based on bioavailability assessment according to 1.3.2.4.5 UN GHS/CLP article 12

Components:

Lithium nickel oxide:

Exposure routes	:	Skin contact
Species	:	Humans
Result	:	positive
Remarks	:	Based on data from similar materials
Assessment	:	Probability or evidence of skin sensitisation in humans

Graphite:

Test Type	:	Local lymph node assay (LLNA)
Exposure routes	:	Skin contact
Species	:	Mouse
Result	:	negative

Copper:

Test Type	:	Maximisation Test
Exposure routes	:	Skin contact
Species	:	Guinea pig
Method	:	OECD Test Guideline 406
Result	:	negative

Aluminium:

Test Type	:	Draize Test
Exposure routes	:	Skin contact
Species	:	Guinea pig
Result	:	negative
Remarks	:	Based on data from similar materials

Cobalt lithium dioxide:

Test Type	:	Local lymph node assay (LLNA)
Exposure routes	:	Skin contact
Species	:	Mouse
Method	:	OECD Test Guideline 429
Result	:	negative
	:	inhalation (dust/mist/fume)
	:	Humans
	:	positive
Remarks	:	Based on data from similar materials
Assessment	:	Probability or evidence of low to moderate respiratory sensitisation rate in humans

methyl propionate:

Test Type	:	Direct Peptide Reactivity Assay (DPRA)
Method	:	OECD Test Guideline 442C
	:	KeratinoSens assay
	:	OECD Test Guideline 442D
Result	:	negative

Lithium hexafluorophosphate:

Test Type	:	Local lymph node assay (LLNA)
Exposure routes	:	Skin contact
Species	:	Mouse
Method	:	OECD Test Guideline 429
Result	:	negative

4-Fluoro-1,3-dioxolan-2-one:

Test Type	:	Local lymph node assay (LLNA)
Exposure routes	:	Skin contact
Species	:	Mouse
Method	:	OECD Test Guideline 429
Result	:	positive
Assessment	:	Probability or evidence of skin sensitisation in humans

Nickel:

Assessment	:	Probability or evidence of skin sensitisation in humans
Remarks	:	Based on harmonised classification in EU regulation 1272/2008, Annex VI

Chronic toxicity

Germ cell mutagenicity

Not classified based on available information.

Components:

Lithium nickel oxide:

Genotoxicity in vitro	:	Test Type: Bacterial reverse mutation assay (AMES) Result: negative Remarks: Based on data from similar materials Test Type: In vitro mammalian cell gene mutation test Result: positive Remarks: Based on data from similar materials Test Type: Chromosome aberration test in vitro Result: positive Remarks: Based on data from similar materials
Genotoxicity in vivo	:	Test Type: Mutagenicity (in vivo mammalian bone-marrow cytogenetic test, chromosomal analysis) Species: Mouse Application Route: Intraperitoneal injection Result: positive Remarks: Based on data from similar materials
Germ cell mutagenicity - Assessment	:	Positive result(s) from in vivo mammalian somatic cell mutagenicity tests.

Graphite:

Genotoxicity in vitro	:	Test Type: Bacterial reverse mutation assay (AMES) Method: OECD Test Guideline 471 Result: negative Test Type: In vitro mammalian cell gene mutation test Method: OECD Test Guideline 476 Result: negative Test Type: Chromosome aberration test in vitro Method: OECD Test Guideline 473 Result: negative

Copper:

Genotoxicity in vitro	:	Test Type: Bacterial reverse mutation assay (AMES) Method: OECD Test Guideline 471 Result: negative Remarks: Based on data from similar materials
Genotoxicity in vivo	:	Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay) Species: Mouse

Application Route: Ingestion
Method: Directive 67/548/EEC, Annex V, B.12.
Result: negative
Remarks: Based on data from similar materials

Aluminium:

Genotoxicity in vitro : Test Type: In vitro mammalian cell gene mutation test
Method: OECD Test Guideline 476
Result: negative

Genotoxicity in vivo : Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)
Species: Rat
Application Route: Ingestion
Method: OECD Test Guideline 474
Result: negative

Cobalt lithium dioxide:

Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)
Method: OECD Test Guideline 471
Result: positive
Remarks: Based on data from similar materials

Test Type: In vitro mammalian cell gene mutation test
Method: OECD Test Guideline 476
Result: positive
Remarks: Based on data from similar materials

Test Type: Chromosome aberration test in vitro
Method: OECD Test Guideline 473
Result: positive
Remarks: Based on data from similar materials

Genotoxicity in vivo : Test Type: Micronucleus test
Species: Mouse
Application Route: Intraperitoneal injection
Result: positive
Remarks: Based on data from similar materials

Test Type: Mutagenicity (in vivo mammalian bone-marrow cytogenetic test, chromosomal analysis)
Species: Mouse
Application Route: Ingestion
Result: positive
Remarks: Based on data from similar materials

Test Type: Rodent dominant lethal test (germ cell) (in vivo)
Species: Mouse
Application Route: Ingestion
Result: positive
Remarks: Based on data from similar materials

Germ cell mutagenicity - Assessment : Positive result(s) from in vivo mammalian somatic cell mutagenicity tests.

methyl propionate:

Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)
Method: OECD Test Guideline 471
Result: negative

Lithium hexafluorophosphate:

Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)
Method: OECD Test Guideline 471
Result: negative

Test Type: In vitro mammalian cell gene mutation test
Result: positive
Remarks: Based on data from similar materials

Test Type: Chromosome aberration test in vitro
Result: positive
Remarks: Based on data from similar materials

Genotoxicity in vivo : Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)
Species: Rat
Application Route: Ingestion
Result: negative
Remarks: Based on data from similar materials

Germ cell mutagenicity - Assessment : Weight of evidence does not support classification as a germ cell mutagen.

4-Fluoro-1,3-dioxolan-2-one:

Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)
Method: OECD Test Guideline 471
Result: positive

Test Type: Chromosome aberration test in vitro
Method: OECD Test Guideline 473
Result: positive

Genotoxicity in vivo : Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)
Species: Mouse
Application Route: Intraperitoneal injection
Method: OECD Test Guideline 474
Result: negative

Carcinogenicity

Not classified based on available information.

Product:

Result : negative
Remarks : Based on bioavailability assessment according to 1.3.2.4.5 UN GHS/CLP article 12

Components:

Lithium nickel oxide:

Species	:	Humans
Application Route	:	inhalation (dust/mist/fume)
Result	:	positive
Remarks	:	Based on data from similar materials
Carcinogenicity - Assessment	:	Positive evidence from human epidemiological studies (inhalation)

Aluminium:

Species	:	Rat
Application Route	:	inhalation (dust/mist/fume)
Exposure time	:	86 weeks
Result	:	negative

Cobalt lithium dioxide:

Species	:	Rat
Application Route	:	inhalation (dust/mist/fume)
Exposure time	:	105 weeks
Result	:	positive
Remarks	:	Based on data from similar materials
Species	:	Mouse
Application Route	:	inhalation (dust/mist/fume)
Exposure time	:	105 weeks
Result	:	positive
Remarks	:	Based on data from similar materials
Carcinogenicity - Assessment	:	Sufficient evidence of carcinogenicity in animal experiments

Nickel:

Carcinogenicity - Assessment	:	Limited evidence of carcinogenicity in inhalation studies with animals.

Reproductive toxicity

Not classified based on available information.

Product:

Effects on fertility	:	Result: negative Remarks: Based on bioavailability assessment according to 1.3.2.4.5 UN GHS/CLP article 12
Effects on foetal development	:	Result: negative Remarks: Based on bioavailability assessment according to 1.3.2.4.5 UN GHS/CLP article 12

Components:

Lithium nickel oxide:

Effects on fertility : Test Type: Two-generation reproduction toxicity study
Species: Rat
Application Route: Ingestion
Method: OECD Test Guideline 416
Result: negative
Remarks: Based on data from similar materials

Reproductive toxicity - Assessment : Some evidence of adverse effects on development, based on animal experiments.

Graphite:

Effects on fertility : Test Type: Combined repeated dose toxicity study with the reproduction/developmental toxicity screening test
Species: Rat
Application Route: Ingestion
Method: OECD Test Guideline 422
Result: negative

Effects on foetal development : Test Type: Combined repeated dose toxicity study with the reproduction/developmental toxicity screening test
Species: Rat
Application Route: Ingestion
Method: OECD Test Guideline 422
Result: negative

Copper:

Effects on fertility : Test Type: Two-generation reproduction toxicity study
Species: Rat
Application Route: Ingestion
Method: OECD Test Guideline 416
Result: negative
Remarks: Based on data from similar materials

Effects on foetal development : Test Type: Embryo-foetal development
Species: Rabbit
Application Route: Ingestion
Result: negative
Remarks: Based on data from similar materials

Aluminium:

Effects on fertility : Test Type: Combined repeated dose toxicity study with the reproduction/developmental toxicity screening test
Species: Rat
Application Route: Ingestion
Method: OECD Test Guideline 422
Result: negative
Remarks: Based on data from similar materials

Effects on foetal development : Test Type: Embryo-foetal development
Species: Mouse

Application Route: Ingestion
Result: negative

Cobalt lithium dioxide:

Effects on fertility : Test Type: Fertility/early embryonic development
Species: Rat
Application Route: Ingestion
Result: positive
Remarks: Based on data from similar materials

Test Type: Fertility/early embryonic development
Species: Mouse
Application Route: Ingestion
Result: positive
Remarks: Based on data from similar materials

Test Type: Fertility/early embryonic development
Species: Mouse
Application Route: inhalation (dust/mist/fume)
Result: positive
Remarks: Based on data from similar materials

Test Type: Fertility/early embryonic development
Species: Rat
Application Route: inhalation (dust/mist/fume)
Result: positive
Remarks: Based on data from similar materials

Effects on foetal development : Test Type: Embryo-foetal development
Species: Rat
Application Route: Ingestion
Method: OECD Test Guideline 414
Result: negative
Remarks: Based on data from similar materials

Reproductive toxicity - Assessment : Clear evidence of adverse effects on sexual function and fertility, based on animal experiments.

Lithium hexafluorophosphate:

Effects on fertility : Test Type: Two-generation reproduction toxicity study
Species: Rat
Application Route: Ingestion
Result: negative
Remarks: Based on data from similar materials

Effects on foetal development : Test Type: Embryo-foetal development
Species: Rat
Application Route: Ingestion
Result: negative
Remarks: Based on data from similar materials

4-Fluoro-1,3-dioxolan-2-one:

Effects on fertility : Test Type: Reproduction/Developmental toxicity screening

test
Species: Rat
Application Route: Ingestion
Method: OECD Test Guideline 421
Result: negative

Effects on foetal development : Test Type: Reproduction/Developmental toxicity screening test
Species: Rat
Application Route: Ingestion
Method: OECD Test Guideline 421
Result: negative

STOT - single exposure

Not classified based on available information.

STOT - repeated exposure

Not classified based on available information.

Product:

Assessment : The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

Remarks : Based on bioavailability assessment according to 1.3.2.4.5 UN GHS/CLP article 12

Components:

Lithium nickel oxide:

Target Organs : Lungs

Assessment : Shown to produce significant health effects in animals at concentrations of 0.02 mg/l/6h/d or less.

Exposure routes : inhalation (dust/mist/fume)

Target Organs : Lungs

Assessment : Shown to produce significant health effects in animals at concentrations of 0.02 mg/l/6h/d or less.

Cobalt lithium dioxide:

Exposure routes : Ingestion

Target Organs : Thyroid, Heart, Blood

Assessment : Shown to produce significant health effects in animals at concentrations of 10 mg/kg bw or less.

Exposure routes : inhalation (dust/mist/fume)

Target Organs : Respiratory Tract

Assessment : Shown to produce significant health effects in animals at concentrations of 0.02 mg/l/6h/d or less.

Lithium hexafluorophosphate:

Exposure routes : Ingestion

Target Organs : Bone, Teeth

Assessment : Shown to produce significant health effects in animals at concentrations of 10 mg/kg bw or less.

Exposure routes	:	inhalation (gas)
Target Organs	:	Bone, Teeth
Assessment	:	Shown to produce significant health effects in animals at concentrations of 50 ppmV/6h/d or less.

4-Fluoro-1,3-dioxolan-2-one:

Exposure routes	:	Ingestion
Target Organs	:	Teeth
Assessment	:	Shown to produce significant health effects in animals at concentrations of 10 mg/kg bw or less.

Nickel:

Exposure routes	:	inhalation (dust/mist/fume)
Target Organs	:	Respiratory Tract
Assessment	:	Shown to produce significant health effects in animals at concentrations of 0.02 mg/l/6h/d or less.

Repeated dose toxicity

Components:

Lithium nickel oxide:

Species	:	Rat
LOAEL	:	> 0.0 - 0.02 mg/l
Application Route	:	inhalation (dust/mist/fume)
Exposure time	:	2 yr
Remarks	:	Based on data from similar materials

Copper:

Species	:	Rat
NOAEL	:	1000 ppm
LOAEL	:	2000 ppm
Application Route	:	Ingestion
Exposure time	:	90 Days

Cobalt lithium dioxide:

Species	:	Rat
LOAEL	:	1.26 mg/kg
Application Route	:	Ingestion
Exposure time	:	90 Days
Method	:	OECD Test Guideline 408
Remarks	:	Based on data from similar materials

Species	:	Mouse
LOAEL	:	< 0.01 mg/l
Application Route	:	inhalation (dust/mist/fume)
Exposure time	:	13 Weeks
Method	:	OECD Test Guideline 413
Remarks	:	Based on data from similar materials

Species	:	Rat

LOAEL	:	< 0.01 mg/l
Application Route	:	inhalation (dust/mist/fume)
Exposure time	:	13 Weeks
Method	:	OECD Test Guideline 413
Remarks	:	Based on data from similar materials

Lithium hexafluorophosphate:

Species	:	Rat
LOAEL	:	< 50 ppm
Application Route	:	inhalation (gas)
Exposure time	:	1 Months
Remarks	:	Based on data from similar materials

4-Fluoro-1,3-dioxolan-2-one:

Species	:	Rat
NOAEL	:	5 mg/kg
Application Route	:	Ingestion
Exposure time	:	35 - 48 Days
Method	:	OECD Test Guideline 421

Nickel:

Species	:	Rat
NOAEL	:	4 mg/m3
Application Route	:	inhalation (dust/mist/fume)
Exposure time	:	4 Weeks
Method	:	OECD Test Guideline 412

Aspiration toxicity

Not classified based on available information.

Experience with human exposure

Components:

Cobalt lithium dioxide:

Inhalation	:	Target Organs: Respiratory system
Ingestion	:	Target Organs: Blood
		Target Organs: Heart
		Target Organs: Thyroid

Section 12: Ecological information

Ecotoxicity

Components:

Lithium nickel oxide:

Toxicity to fish	:	LC50 (Pimephales promelas (fathead minnow)): > 0.1 - 1 mg/l

Exposure time: 96 h
Remarks: Based on data from similar materials

Toxicity to daphnia and other aquatic invertebrates : LC50 (Ceriodaphnia dubia (water flea)): > 0.1 - 1 mg/l
Exposure time: 48 h
Remarks: Based on data from similar materials

Toxicity to algae/aquatic plants : EC50 (Pseudokirchneriella subcapitata (green algae)): > 0.1 - 1 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201
Remarks: Based on data from similar materials

Toxicity to fish (Chronic toxicity) : NOEC (Danio rerio (zebra fish)): > 0.01 - 0.1 mg/l
Exposure time: 8 d
Remarks: Based on data from similar materials

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : EC10 (Ceriodaphnia dubia (water flea)): > 0.001 - 0.01 mg/l
Exposure time: 7 d
Remarks: Based on data from similar materials

Toxicity to microorganisms : EC50: > 10 - 100 mg/l
Exposure time: 3 h
Method: ISO 8192
Remarks: Based on data from similar materials

Graphite:

Toxicity to fish : LL50 (Danio rerio (zebra fish)): > 100 mg/l
Exposure time: 96 h
Test substance: Water Accommodated Fraction
Method: OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates : EL50 (Daphnia magna (Water flea)): > 100 mg/l
Exposure time: 48 h
Test substance: Water Accommodated Fraction
Method: OECD Test Guideline 202

Toxicity to algae/aquatic plants : EL50 (Pseudokirchneriella subcapitata (green algae)): > 100 mg/l
Exposure time: 72 h
Test substance: Water Accommodated Fraction
Method: OECD Test Guideline 201

NOELR (Pseudokirchneriella subcapitata (green algae)): > 100 mg/l
Exposure time: 72 h
Test substance: Water Accommodated Fraction
Method: OECD Test Guideline 201

Toxicity to microorganisms : EC50: > 1,012.5 mg/l
Exposure time: 3 h
Method: OECD Test Guideline 209

Copper:

Ecotoxicology Assessment

Acute aquatic toxicity	:	No toxicity at the limit of solubility
Chronic aquatic toxicity	:	No toxicity at the limit of solubility

Aluminium:

Toxicity to fish	:	(Oncorhynchus mykiss (rainbow trout)): Exposure time: 96 h Remarks: No toxicity at the limit of solubility Based on data from similar materials
Toxicity to daphnia and other aquatic invertebrates	:	(Daphnia magna (Water flea)): Exposure time: 48 h Method: OECD Test Guideline 202 Remarks: No toxicity at the limit of solubility
Toxicity to algae/aquatic plants	:	(Pseudokirchneriella subcapitata (green algae)): Exposure time: 72 h Method: OECD Test Guideline 201 Remarks: No toxicity at the limit of solubility Based on data from similar materials
Toxicity to fish (Chronic toxicity)	:	NOEC (Pimephales promelas (fathead minnow)): 7.1 mg/l Exposure time: 28 d Remarks: Based on data from similar materials
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	NOEC (Daphnia magna (Water flea)): 1.89 mg/l Exposure time: 28 d Remarks: Based on data from similar materials

Cobalt lithium dioxide:

Toxicity to fish	:	LL50 (Oncorhynchus mykiss (rainbow trout)): > 100 mg/l Exposure time: 96 h Remarks: Based on transformation/dissolution testing and data from soluble metal compounds
Toxicity to daphnia and other aquatic invertebrates	:	EL50 (Ceriodaphnia dubia (water flea)): > 100 mg/l Exposure time: 48 h Remarks: Based on transformation/dissolution testing and data from soluble metal compounds
Toxicity to algae/aquatic plants	:	EL50 (Champia parvula (marine algae)): > 1 - 10 mg/l Exposure time: 7 d Remarks: Based on transformation/dissolution testing and data from soluble metal compounds EL10 (Champia parvula (marine algae)): > 0.1 - 1 mg/l Exposure time: 7 d Remarks: Based on transformation/dissolution testing and data from soluble metal compounds
Toxicity to fish (Chronic toxicity)	:	EL10 (Danio rerio (zebra fish)): > 1 mg/l Exposure time: 34 d Remarks: Based on transformation/dissolution testing and

data from soluble metal compounds

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : EL10: > 1 mg/l
Exposure time: 28 d
Method: OECD Test Guideline 211
Remarks: Based on transformation/dissolution testing and data from soluble metal compounds

methyl propionate:

Toxicity to algae/aquatic plants : EC10 (Desmodesmus subspicatus (green algae)): > 500 mg/l
Exposure time: 72 h

ErC50 (Desmodesmus subspicatus (green algae)): > 500 mg/l
Exposure time: 72 h

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Daphnia magna (Water flea)): 3.2 mg/l
Exposure time: 21 d

Lithium hexafluorophosphate:

Toxicity to fish : LC50: > 10 - 100 mg/l
Exposure time: 96 h
Remarks: Based on data from similar materials

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): > 10 - 100 mg/l
Exposure time: 48 h
Remarks: Based on data from similar materials

Toxicity to algae/aquatic plants : EC50: > 10 - 100 mg/l
Exposure time: 96 h
Remarks: Based on data from similar materials

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Daphnia magna (Water flea)): > 1 - 10 mg/l
Exposure time: 21 d
Remarks: Based on data from similar materials

Toxicity to microorganisms : NOEC: > 100 mg/l
Exposure time: 3 h
Method: OECD Test Guideline 209
Remarks: Based on data from similar materials

4-Fluoro-1,3-dioxolan-2-one:

Toxicity to fish : LC50 (Danio rerio (zebra fish)): > 6 - 60 mg/l
Exposure time: 96 h
Method: OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 8.4 mg/l
Exposure time: 48 h
Method: OECD Test Guideline 202

Toxicity to algae/aquatic plants : ErC50 (Pseudokirchneriella subcapitata (green algae)): 32 mg/l
Exposure time: 72 h

Method: OECD Test Guideline 201

NOEC (Pseudokirchneriella subcapitata (green algae)): 2.2 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201

Toxicity to microorganisms : NOEC: 80 mg/l
Exposure time: 3 h
Method: OECD Test Guideline 209

Nickel:

Ecotoxicology Assessment

Acute aquatic toxicity : No toxicity at the limit of solubility

Chronic aquatic toxicity : No toxicity at the limit of solubility

Persistence and degradability

Components:

methyl propionate:

Biodegradability : Result: Readily biodegradable.
Biodegradation: 77 %
Exposure time: 28 d
Method: OECD Test Guideline 301F

Lithium hexafluorophosphate:

Biodegradability : Result: rapidly degradable

4-Fluoro-1,3-dioxolan-2-one:

Biodegradability : Result: Readily biodegradable.
Biodegradation: 65 %
Exposure time: 28 d
Method: OECD Test Guideline 301D

Bioaccumulative potential

Components:

methyl propionate:

Partition coefficient: n-octanol/water : log Pow: 0.8
Method: OECD Test Guideline 117

4-Fluoro-1,3-dioxolan-2-one:

Partition coefficient: n-octanol/water : log Pow: -0.435
Method: OECD Test Guideline 107

Nickel:

Bioaccumulation : Bioconcentration factor (BCF): < 500

Remarks: Expert judgement

Mobility in soil

No data available

Other adverse effects

No data available

Section 13: Disposal considerations

Disposal methods

Waste from residues	:	Dispose of in accordance with local regulations.
Contaminated packaging	:	Empty containers should be taken to an approved waste handling site for recycling or disposal. If not otherwise specified: Dispose of as unused product.

Section 14: Transport information

International Regulations

UNRTDG

UN number	:	Not applicable
Proper shipping name	:	Not applicable
Class	:	Not applicable
Subsidiary risk	:	Not applicable
Packing group	:	Not applicable
Labels	:	Not applicable

IATA-DGR

UN/ID No.	:	UN 3480
Proper shipping name	:	Lithium ion batteries
Class	:	9
Packing group	:	Not assigned by regulation
Labels	:	
Packing instruction (cargo aircraft)	:	965
Packing instruction (passenger aircraft)	:	Not permitted for transport

IMDG-Code

UN number	:	Not applicable
Proper shipping name	:	Not applicable
Class	:	Not applicable
Subsidiary risk	:	Not applicable
Packing group	:	Not applicable
Labels	:	Not applicable
EmS Code	:	Not applicable
Marine pollutant	:	Not applicable
Remarks	:	Transport in accordance with special regulation 188

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable for product as supplied.

National Regulations

NZS 5433

UN number	:	Not applicable
Proper shipping name	:	Not applicable
Class	:	Not applicable
Subsidiary risk	:	Not applicable
Packing group	:	Not applicable
Labels	:	Not applicable
Hazchem Code	:	Not applicable
Remarks	:	Transport in accordance with special regulation 188

Special precautions for user

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

Section 15: Regulatory information

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

HSNO Approval Number

Not applicable

HSW Controls

Certified handler certificate not required.
Tracking hazardous substance not required.
Refer to the Health and Safety at Work (Hazardous Substances) Regulations 2017, for further information.

Section 16: Other information

Further information

Sources of key data used to compile the Safety Data Sheet	:	Internal technical data, data from raw material SDSs, OECD eChem Portal search results and European Chemicals Agency, http://echa.europa.eu/

Items where changes have been made to the previous version are highlighted in the body of this document by two vertical lines.

Date format	:	dd.mm.yyyy

Full text of other abbreviations

ACGIH	:	USA. ACGIH Threshold Limit Values (TLV)
ACGIH BEI	:	ACGIH - Biological Exposure Indices (BEI)
NZ BEI	:	New Zealand. Biological Exposure Indices
NZ OEL	:	New Zealand. Workplace Exposure Standards for Atmospheric Contaminants
ACGIH / TWA	:	8-hour, time-weighted average
ACGIH / STEL	:	Short-term exposure limit

ACGIH / C	:	Ceiling limit
NZ OEL / WES-TWA	:	Workplace Exposure Standard - Time Weighted average
NZ OEL / WES-Ceiling	:	Workplace Exposure Standard - Ceiling

AIIC - Australian Inventory of Industrial Chemicals; ANTT - National Agency for Transport by Land of Brazil; ASTM - American Society for the Testing of Materials; bw - Body weight; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; Nch - Chilean Norm; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NOM - Official Mexican Norm; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TDG - Transportation of Dangerous Goods; TECI - Thailand Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative; WHMIS - Workplace Hazardous Materials Information System

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 is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and shall not be considered a warranty or quality specification of any type. The information provided relates only to the specific material identified at the top of this SDS and may not be valid when the SDS material is used in combination with any other materials or in any process, unless specified in the text. Material users should review the information and recommendations in the specific context of their intended manner of handling, use, processing and storage, including an assessment of the appropriateness of the SDS material in the user's end product, if applicable.

NZ / EN