Safety data sheet Safety data sheet

acc. to Safe Work Australia - Code of Practice

Multi-Element ICP - Standard Solution CR-05 ROTI®Star 19 elements in 5 % HNO_3 - mg/l

article number: **1LHP**
Version: **GHS 2.0 en**
Replaces version of: 2021-10-12
Version: (GHS 1)

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SECTION 1: Identification of the substance/mixture and of the company/ undertaking

1.1 Product identifier

Identification of the substance: **Multi-Element** ICP - Standard Solution CR-05 ROTI®Star 19 elements in 5 % HNO_3 - mg/l

Article number: 1LHP

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

Relevant identified uses: Laboratory chemical
Laboratory and analytical use

Uses advised against: Do not use for squirting or spraying. Do not use for products which come into direct contact with the skin. Do not use for products which come into contact with foodstuffs. Do not use for private purposes (household).

1.3 Details of the supplier of the safety data sheet

Carl Roth GmbH + Co KG
Schoemperlenstr. 3-5
D-76185 Karlsruhe
Germany

Telephone:+49 (0) 721 - 56 06 0
Telefax: +49 (0) 721 - 56 06 149
e-mail: sicherheit@carlroth.de
Website: www.carlroth.de

Competent person responsible for the safety data sheet: :Department Health, Safety and Environment

e-mail (competent person): **sicherheit@carlroth.de**

1.4 Emergency telephone number

Name	Street	Postal code/city	Telephone	Website
NSW Poisons Information Centre Childrens Hospital	Hawkesbury Road	2145 Westmead, NSW	131126	

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification acc. to GHS

Section	Hazard class	Category	Hazard class and category	Hazard statement
2.13	Oxidising liquid	3	Ox. Liq. 3	H272
2.16	Substance or mixture corrosive to metals	1	Met. Corr. 1	H290
3.2	Skin corrosion/irritation	1B	Skin Corr. 1B	H314

Section	Hazard class	Cat-egory	Hazard class and category	Hazard statement
3.3	Serious eye damage/eye irritation	1	Eye Dam. 1	H318
3.4S	Skin sensitisation	1	Skin Sens. 1	H317
3.5	Germ cell mutagenicity	1B	Muta. 1B	H340
3.6	Carcinogenicity	1A	Carc. 1A	H350i

Supplemental hazard information

Code	Supplemental hazard information
EUH071	corrosive to the respiratory tract

For full text of abbreviations: see SECTION 16

The most important adverse physicochemical, human health and environmental effects

Skin corrosion produces an irreversible damage to the skin; namely, visible necrosis through the epidermis and into the dermis.

2.2 Label elements

Labelling

Signal word **Danger**

Pictograms

GHS03, GHS05, GHS07, GHS08

Hazard statements

H272	May intensify fire; oxidiser
H290	May be corrosive to metals
H314	Causes severe skin burns and eye damage
H317	May cause an allergic skin reaction
H340	May cause genetic defects
H350i	May cause cancer by inhalation

Precautionary statements

Precautionary statements - prevention

P210	Keep away from heat/sparks/open flames/hot surfaces. - No smoking
P260	Do not breathe dusts or mists
P280	Wear eye protection/face protection

Precautionary statements - response

P302+P352	IF ON SKIN: Wash with plenty of soap and water
P303+P361+P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or 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
P370+P378	In case of fire: Use sand, carbon dioxide or powder extinguisher for extinction

For professional users only

Hazardous ingredients for labelling: Cadmium nitrate, Nitric acid ...% [C ≤ 70 %], Nickel dinitrate, Calcium nitrate, Cobalt(II) nitrate hexahydrate

2.3 Other hazards

Results of PBT and vPvB assessment

This mixture does not contain any substances that are assessed to be a PBT or a vPvB.

SECTION 3: Composition/information on ingredients

3.1 Substances

not relevant (mixture)

3.2 Mixtures

Description of the mixture

Name of substance	Identifier	Wt%	Classification acc. to GHS	Pictograms	Notes
Nitric acid ...% [C ≤ 70 %]	CAS No 7697-37-2	5	Ox. Liq. 3 / H272 Met. Corr. 1 / H290 Acute Tox. 3 / H331 Skin Corr. 1A / H314 Eye Dam. 1 / H318 EUH071		B(a)
magnesium nitrate	CAS No 10377-60-3	< 4	Ox. Sol. 2 / H272		
Calcium nitrate	CAS No 10124-37-5	< 3	Ox. Sol. 3 / H272 Acute Tox. 4 / H302 Eye Dam. 1 / H318		
Sodium nitrate	CAS No 7631-99-4	< 2	Ox. Sol. 3 / H272 Eye Irrit. 2A / H319		
Potassium nitrate	CAS No 7757-79-1	< 2	Ox. Sol. 3 / H272		
Boric acid	CAS No 10043-35-3	< 0.5	Repr. 1B / H360FD		
nickel dinitrate	CAS No 13138-45-9	< 0.5	Ox. Sol. 2 / H272 Acute Tox. 4 / H302 Acute Tox. 4 / H332 Skin Irrit. 2 / H315 Eye Dam. 1 / H318 Resp. Sens. 1 / H334 Skin Sens. 1 / H317 Muta. 2 / H341 Carc. 1A / H350 Repr. 1A / H360D STOT RE 1 / H372		

Name of sub-stance	Identifier	Wt%	Classification acc. to GHS	Pictograms	Notes
Cobalt(II) nitrate hexahydrate	CAS No 10026-22-9	< 0.5	Ox. Sol. 2 / H272 Acute Tox. 4 / H302 Eye Dam. 1 / H318 Resp. Sens. 1 / H334 Skin Sens. 1 / H317 Muta. 2 / H341 Carc. 1B / H350i Repr. 1B / H360F		1(a) IARC: 2B
Cadmium nitrate	CAS No 10325-94-7	< 0.5	Acute Tox. 3 / H301 Acute Tox. 4 / H312 Acute Tox. 4 / H332 Muta. 1B / H340 Carc. 1B / H350 STOT RE 1 / H372		IARC: 1 RoC "Known"

Notes

1(a): The concentration stated is the percentage by weight of the metallic element calculated with reference to the total weight of the mixture
B(a): The classification refers to an aqueous solution
IARC: 1: IARC group 1: carcinogenic to humans (International Agency for Research on Cancer)
IARC: 2B: IARC group 2B: possibly carcinogenic to humans (International Agency for Research on Cancer)
RoC "Known": NTP-RoC: Known To Be A Human Carcinogen

For full text of abbreviations: see SECTION 16

SECTION 4: First aid measures

4.1 Description of first aid measures

General notes

Take off immediately all contaminated clothing. Self-protection of the first aider.

Following inhalation

Provide fresh air. In all cases of doubt, or when symptoms persist, seek medical advice.

Following skin contact

After contact with skin, wash immediately with plenty of water. Immediate medical treatment required because corrosive injuries that are not treated are hard to cure.

Following eye contact

In case of contact with eyes flush immediately with plenty of flowing water for 10 to 15 minutes holding eyelids apart and consult an ophthalmologist. Protect uninjured eye.

Following ingestion

Rinse mouth immediately and drink plenty of water. Call a physician immediately. If swallowed danger of perforation of the esophagus and the stomach (strong corrosive effects).

4.2 Most important symptoms and effects, both acute and delayed

Corrosion, Risk of blindness, Gastric perforation, Risk of serious damage to eyes, Allergic reactions

4.3 Indication of any immediate medical attention and special treatment needed

none

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media

co-ordinate firefighting measures to the fire surroundings
water spray, alcohol resistant foam, dry extinguishing powder, BC-powder, carbon dioxide (CO_2)

Unsuitable extinguishing media

water jet

5.2 Special hazards arising from the substance or mixture

Oxidising property. Non-combustible.

Hazardous combustion products

In case of fire may be liberated: Nitrogen oxides (NOx)

5.3 Advice for firefighters

In case of fire and/or explosion do not breathe fumes. Fight fire with normal precautions from a reasonable distance. Wear self-contained breathing apparatus. Wear full chemical protective clothing.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel

Use personal protective equipment as required. Avoid contact with skin, eyes and clothes. Do not breathe vapour/spray.

6.2 Environmental precautions

Keep away from drains, surface and ground water. The product is an acid. Before discharge into sewage plants the product normally needs to be neutralised.

6.3 Methods and material for containment and cleaning up

Advice on how to contain a spill

Covering of drains.

Advice on how to clean up a spill

Absorb with liquid-binding material (sand, diatomaceous earth, acid- or universal binding agents).

Other information relating to spills and releases

Place in appropriate containers for disposal. Ventilate affected area.

6.4 Reference to other sections

Hazardous combustion products: see section 5. Personal protective equipment: see section 8. Incompatible materials: see section 10. Disposal considerations: see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Use extractor hood (laboratory). Handle and open container with care. Avoid exposure. Clear contaminated areas thoroughly.

Measures to prevent fire as well as aerosol and dust generation

Take any precaution to avoid mixing with combustibles.

Advice on general occupational hygiene

Wash hands before breaks and after work. Keep away from food, drink and animal feedingstuffs.

7.2 Conditions for safe storage, including any incompatibilities

Keep container tightly closed.

Incompatible substances or mixtures

Observe hints for combined storage. Keep/store away from clothing/combustible materials. Take any precaution to avoid mixing with combustibles.

Consideration of other advice:

Specific designs for storage rooms or vessels

Recommended storage temperature: 15 – 25 °C

7.3 Specific end use(s)

No information available.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

National limit values

Occupational exposure limit values (Workplace Exposure Limits)

Country	Name of agent	CAS No	Identifier	TWA [ppm]	TWA [mg/m³]	STEL [ppm]	STEL [mg/m³]	Ceiling-C [ppm]	Ceiling-C [mg/m³]	Notation	Source
AU	lead, inorganic compounds		WES		0.05					Pb, df	WES
AU	nickel dinitrate	13138-45-9	WES		0.1						WES
AU	nitric acid	7697-37-2	WES	2	5.2	4	10				WES

Notation

Ceiling-C	Ceiling value is a limit value above which exposure should not occur
df	As dust and fumes
Pb	Calculated as Pb (lead)
STEL	Short-term exposure limit: a limit value above which exposure should not occur and which is related to a 15-minute period (unless otherwise specified)
TWA	Time-weighted average (long-term exposure limit): measured or calculated in relation to a reference period of 8 hours time-weighted average (unless otherwise specified)

Relevant DNELs of components of the mixture

Name of substance	CAS No	End-point	Threshold level	Protection goal, route of exposure	Used in	Exposure time
magnesium nitrate	10377-60-3	DNEL	147 mg/m³	human, inhalatory	worker (industry)	chronic - systemic effects
magnesium nitrate	10377-60-3	DNEL	20.8 mg/kg	human, dermal	worker (industry)	chronic - systemic effects
Sodium nitrate	7631-99-4	DNEL	20.8 mg/kg	human, dermal	worker (industry)	chronic - systemic effects
Sodium nitrate	7631-99-4	DNEL	36.7 mg/m³	human, inhalatory	worker (industry)	chronic - systemic effects
Boric acid	10043-35-3	DNEL	8.3 mg/m³	human, inhalatory	worker (industry)	chronic - systemic effects
Boric acid	10043-35-3	DNEL	392 mg/kg bw/day	human, dermal	worker (industry)	chronic - systemic effects
Cobalt(II) nitrate hexahydrate	10026-22-9	DNEL	124.2 µg/m³	human, inhalatory	worker (industry)	chronic - local effects
Cadmium nitrate	10325-94-7	DNEL	4 µg/m³	human, inhalatory	worker (industry)	chronic - systemic effects

Relevant PNECs of components of the mixture

Name of substance	CAS No	End-point	Threshold level	Organism	Environmental compartment	Exposure time
magnesium nitrate	10377-60-3	PNEC	0.45 mg/l	aquatic organisms	freshwater	short-term (single instance)
magnesium nitrate	10377-60-3	PNEC	0.045 mg/l	aquatic organisms	marine water	short-term (single instance)
magnesium nitrate	10377-60-3	PNEC	4.5 mg/l	aquatic organisms	water	intermittent release
magnesium nitrate	10377-60-3	PNEC	18 mg/l	aquatic organisms	sewage treatment plant (STP)	short-term (single instance)
Calcium nitrate	10124-37-5	PNEC	18 mg/l	aquatic organisms	sewage treatment plant (STP)	short-term (single instance)
Sodium nitrate	7631-99-4	PNEC	0.45 mg/l	aquatic organisms	freshwater	short-term (single instance)
Sodium nitrate	7631-99-4	PNEC	0.045 mg/l	aquatic organisms	marine water	short-term (single instance)
Sodium nitrate	7631-99-4	PNEC	4.5 mg/l	aquatic organisms	water	intermittent release
Sodium nitrate	7631-99-4	PNEC	18 mg/l	aquatic organisms	sewage treatment plant (STP)	short-term (single instance)
Potassium nitrate	7757-79-1	PNEC	18 mg/l	aquatic organisms	sewage treatment plant (STP)	short-term (single instance)
Boric acid	10043-35-3	PNEC	2.9 mg/l	aquatic organisms	freshwater	short-term (single instance)

Relevant PNECs of components of the mixture

Name of substance	CAS No	End-point	Threshold level	Organism	Environmental compartment	Exposure time
Boric acid	10043-35-3	PNEC	2.9 mg/l	aquatic organisms	marine water	short-term (single instance)
Boric acid	10043-35-3	PNEC	10 mg/l	aquatic organisms	sewage treatment plant (STP)	short-term (single instance)
Boric acid	10043-35-3	PNEC	5.7 mg/kg	terrestrial organisms	soil	short-term (single instance)
Cobalt(II) nitrate hexahydrate	10026-22-9	PNEC	0.62 µg/l	aquatic organisms	freshwater	short-term (single instance)
Cobalt(II) nitrate hexahydrate	10026-22-9	PNEC	2.36 µg/l	aquatic organisms	marine water	short-term (single instance)
Cobalt(II) nitrate hexahydrate	10026-22-9	PNEC	0.37 mg/l	aquatic organisms	sewage treatment plant (STP)	short-term (single instance)
Cobalt(II) nitrate hexahydrate	10026-22-9	PNEC	53.8 mg/kg	aquatic organisms	freshwater sediment	short-term (single instance)
Cobalt(II) nitrate hexahydrate	10026-22-9	PNEC	69.8 mg/kg	aquatic organisms	marine sediment	short-term (single instance)
Cobalt(II) nitrate hexahydrate	10026-22-9	PNEC	10.9 mg/kg	terrestrial organisms	soil	short-term (single instance)
Cadmium nitrate	10325-94-7	PNEC	0.19 µg/l	aquatic organisms	freshwater	short-term (single instance)
Cadmium nitrate	10325-94-7	PNEC	1.14 µg/l	aquatic organisms	marine water	short-term (single instance)
Cadmium nitrate	10325-94-7	PNEC	20 µg/l	aquatic organisms	sewage treatment plant (STP)	short-term (single instance)
Cadmium nitrate	10325-94-7	PNEC	1.8 mg/kg	aquatic organisms	freshwater sediment	short-term (single instance)
Cadmium nitrate	10325-94-7	PNEC	0.64 mg/kg	aquatic organisms	marine sediment	short-term (single instance)
Cadmium nitrate	10325-94-7	PNEC	0.9 mg/kg	terrestrial organisms	soil	short-term (single instance)

8.2 Exposure controls

Individual protection measures (personal protective equipment)

Eye/face protection

Use safety goggle with side protection. Wear face protection.

Skin protection

• hand protection

Wear suitable gloves. Chemical protection gloves are suitable, which are tested according to EN 374. Check leak-tightness/impermeability prior to use. For special purposes, it is recommended to check the resistance to chemicals of the protective gloves mentioned above together with the supplier of these gloves. The times are approximate values from measurements at 22 ° C and permanent contact. Increased temperatures due to heated substances, body heat etc. and a reduction of the effective layer thickness by stretching can lead to a considerable reduction of the breakthrough time. If in doubt, contact manufacturer. At an approx. 1.5 times larger / smaller layer thickness, the respective breakthrough time is doubled / halved. The data apply only to the pure substance. When transferred to substance mixtures, they may only be considered as a guide.

• type of material

NBR (Nitrile rubber)

• material thickness

>0,11 mm

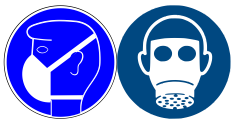
• breakthrough times of the glove material

>480 minutes (permeation: level 6)

• other protection measures

Take recovery periods for skin regeneration. Preventive skin protection (barrier creams/ointments) is recommended.

Respiratory protection



Respiratory protection necessary at: Aerosol or mist formation. Type: NO (against nitrous gases (nitrogen oxides), colour code: Blue).

Environmental exposure controls

Keep away from drains, surface and ground water.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state	liquid
Colour	colourless - light yellow
Odour	stinging
Melting point/freezing point	0 °C
Boiling point or initial boiling point and boiling range	100 °C
Flammability	non-combustible
Lower and upper explosion limit	not determined
Flash point	not determined
Auto-ignition temperature	not determined
Decomposition temperature	not relevant
pH (value)	<2 (20 °C)

Kinematic viscosity	not determined
Solubility(ies)	
Water solubility	miscible in any proportion
Partition coefficient	
Partition coefficient n-octanol/water (log value):	not relevant (inorganic)
Vapour pressure	23 hPa at 20 °C
Density and/or relative density	
Density	~ 1 $^{g}/_{cm^3}$ at 20 °C
Relative vapour density	information on this property is not available
Particle characteristics	not relevant (liquid)
Other safety parameters	
Oxidising properties	oxidiser

9.2 Other information

Information with regard to physical hazard classes:

Corrosive to metals	category 1: corrosive to metals
Other safety characteristics:	
Miscibility	completely miscible with water

SECTION 10: Stability and reactivity

10.1 Reactivity

The mixture contains reactive substance(s). Oxidising property. Substance or mixture corrosive to metals.

10.2 Chemical stability

The material is stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

10.3 Possibility of hazardous reactions

Violent reaction with: Ammonia (NH3), Bases, Metals, Reducing agents, Strong alkali, Organic solvents

10.4 Conditions to avoid

Keep away from heat.

10.5 Incompatible materials

different metals (due to the release of hydrogen in an acid/alkaline medium)

10.6 Hazardous decomposition products

Hazardous combustion products: see section 5.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Test data are not available for the complete mixture.

Classification procedure

The method for classification of the mixture is based on ingredients of the mixture (additivity formula).

Classification acc. to GHS

Acute toxicity

Shall not be classified as acutely toxic.

Acute toxicity estimate (ATE) of components of the mixture

Name of substance	CAS No	Exposure route	ATE
Nitric acid ...% [C ≤ 70 %]	7697-37-2	inhalation: vapour	>2.65 mg/l/4h
Calcium nitrate	10124-37-5	oral	>300 mg/kg
nickel dinitrate	13138-45-9	oral	1,620 mg/kg
nickel dinitrate	13138-45-9	inhalation: dust/mist	1.5 mg/l/4h
Cobalt(II) nitrate hexahydrate	10026-22-9	oral	434 mg/kg
Cadmium nitrate	10325-94-7	oral	147 mg/kg
Cadmium nitrate	10325-94-7	dermal	1,100 mg/kg
Cadmium nitrate	10325-94-7	inhalation: dust/mist	1.5 mg/l/4h

Acute toxicity of components of the mixture

Name of substance	CAS No	Exposure route	Endpoint	Value	Species
Nitric acid ...% [C ≤ 70 %]	7697-37-2	inhalation: vapour	LC50	>2.65 mg/l/4h	rat
magnesium nitrate	10377-60-3	oral	LD50	>2,000 mg/kg	rat
magnesium nitrate	10377-60-3	dermal	LD50	>5,000 mg/kg	rat
Calcium nitrate	10124-37-5	oral	LD50	>300 – <2,000 mg/kg	rat
Calcium nitrate	10124-37-5	dermal	LD50	>2,000 mg/kg	rat
Sodium nitrate	7631-99-4	oral	LD50	3,430 mg/kg	rat
Sodium nitrate	7631-99-4	dermal	LD50	>5,000 mg/kg	rat
Potassium nitrate	7757-79-1	oral	LD50	>2,000 mg/kg	rat
Potassium nitrate	7757-79-1	dermal	LD50	>5,000 mg/kg	rat
Boric acid	10043-35-3	oral	LD50	3,450 mg/kg	rat

Acute toxicity of components of the mixture					
Name of substance	**CAS No**	**Exposure route**	**Endpoint**	**Value**	**Species**
Boric acid	10043-35-3	dermal	LD50	>2,000 $^{mg}/_{kg}$	rabbit
nickel dinitrate	13138-45-9	oral	LD50	1,620 $^{mg}/_{kg}$	rat
Cobalt(II) nitrate hexahydrate	10026-22-9	oral	LD50	434 $^{mg}/_{kg}$	rat
Cadmium nitrate	10325-94-7	oral	LD50	147 $^{mg}/_{kg}$	rat

Skin corrosion/irritation

Causes severe skin burns and eye damage.

Serious eye damage/eye irritation

Causes serious eye damage.

Respiratory or skin sensitisation

May cause an allergic skin reaction.

Germ cell mutagenicity

May cause genetic defects.

Carcinogenicity

May cause cancer by inhalation.

Reproductive toxicity

Shall not be classified as a reproductive toxicant.

Specific target organ toxicity - single exposure

Shall not be classified as a specific target organ toxicant (single exposure).

Specific target organ toxicity - repeated exposure

Shall not be classified as a specific target organ toxicant (repeated exposure).

Aspiration hazard

Shall not be classified as presenting an aspiration hazard.

Symptoms related to the physical, chemical and toxicological characteristics

• If swallowed

If swallowed danger of perforation of the esophagus and the stomach (strong corrosive effects)

• If in eyes

causes burns, Causes serious eye damage, risk of blindness

• If inhaled

corrosive to the respiratory tract, cough, Dyspnoea

• If on skin

causes severe burns, causes poorly healing wounds, May produce an allergic reaction, pruritis, localised redness

• Other information

This information is based upon the present state of our knowledge.

11.2 Endocrine disrupting properties

Information on this property is not available.

SECTION 12: Ecological information

12.1 Toxicity

Toxic to aquatic life with long lasting effects.

Aquatic toxicity (acute) of components of the mixture

Name of sub-stance	CAS No	Endpoint	Value	Species	Exposure time
magnesium nitrate	10377-60-3	LC50	1,378 mg/l	fish	96 h
magnesium nitrate	10377-60-3	EC50	490 mg/l	aquatic invertebrates	48 h
Calcium nitrate	10124-37-5	LC50	>100 mg/l	fish	96 h
Calcium nitrate	10124-37-5	EC50	490 mg/l	aquatic invertebrates	24 h
Sodium nitrate	7631-99-4	EC50	8,609 mg/l	aquatic invertebrates	24 h
Potassium nitrate	7757-79-1	LC50	>100 mg/l	fish	96 h
Potassium nitrate	7757-79-1	EC50	490 mg/l	aquatic invertebrates	48 h
Cobalt(II) nitrate hexahydrate	10026-22-9	LC50	1.512 mg/l	fish	96 h
Cobalt(II) nitrate hexahydrate	10026-22-9	EC50	2,618 µg/l	aquatic invertebrates	48 h
Cobalt(II) nitrate hexahydrate	10026-22-9	ErC50	71,314 µg/l	algae	96 h
Cadmium nitrate	10325-94-7	LC50	58.16 µg/l	aquatic invertebrates	48 h
Cadmium nitrate	10325-94-7	EC50	1,900 µg/l	aquatic invertebrates	24 h
Cadmium nitrate	10325-94-7	ErC50	70 µg/l	algae	72 h

Aquatic toxicity (chronic) of components of the mixture

Name of sub-stance	CAS No	Endpoint	Value	Species	Exposure time
magnesium nitrate	10377-60-3	EC50	490 mg/l	aquatic invertebrates	24 h
magnesium nitrate	10377-60-3	ErC50	>1,700 mg/l	algae	10 d
Calcium nitrate	10124-37-5	ErC50	>1,700 mg/l	algae	10 d
Calcium nitrate	10124-37-5	EC50	>1,000 mg/l	microorganisms	180 min
Sodium nitrate	7631-99-4	ErC50	>1,700 mg/l	algae	10 d
Sodium nitrate	7631-99-4	EC50	>1,000 mg/l	microorganisms	180 min
Potassium nitrate	7757-79-1	ErC50	>1,700 mg/l	algae	10 d
Potassium nitrate	7757-79-1	EC50	>1,000 mg/l	microorganisms	180 min

Aquatic toxicity (chronic) of components of the mixture					
Name of sub-stance	**CAS No**	**Endpoint**	**Value**	**Species**	**Exposure time**
Cobalt(II) nitrate hexahydrate	10026-22-9	EC50	82.2 µg/l	aquatic invertebrates	21 d
Cadmium nitrate	10325-94-7	LC50	1,500 µg/l	fish	4 d
Cadmium nitrate	10325-94-7	EC50	8.1 µg/l	fish	100 d

Biodegradation

The methods for determining the biological degradability are not applicable to inorganic substances.

12.2 Process of degradability

Data are not available.

12.3 Bioaccumulative potential

Data are not available.

Bioaccumulative potential of components of the mixture				
Name of substance	**CAS No**	**BCF**	**Log KOW**	**BOD5/COD**
Boric acid	10043-35-3		-1.09 (pH value: 7.5, 22 °C)	
Cobalt(II) nitrate hexahydrate	10026-22-9	23		

12.4 Mobility in soil

Data are not available.

12.5 Results of PBT and vPvB assessment

Data are not available.

12.6 Endocrine disrupting properties

Information on this property is not available.

12.7 Other adverse effects

Data are not available.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

This material and its container must be disposed of as hazardous waste. Dispose of contents/container in accordance with local/regional/national/international regulations.

Sewage disposal-relevant information

Do not empty into drains.

Waste treatment of containers/packagings

Only packagings which are approved (e.g. acc. to the Dangerous Goods Regulations) may be used.

Relevant provisions relating to waste(Basel Convention)

Properties of waste which render it hazardous

H8	Corrosives
H11	Toxic (Delayed or chronic)

13.3 Remarks

Waste shall be separated into the categories that can be handled separately by the local or national waste management facilities. Please consider the relevant national or regional provisions.

SECTION 14: Transport information

14.1 UN number

UN RTDG	UN 2031
IMDG-Code	UN 2031
ICAO-TI	UN 2031

14.2 UN proper shipping name

UN RTDG	NITRIC ACID
IMDG-Code	NITRIC ACID
ICAO-TI	Nitric acid

14.3 Transport hazard class(es)

UN RTDG	8
IMDG-Code	8
ICAO-TI	8

14.4 Packing group

UN RTDG	II
IMDG-Code	II
ICAO-TI	II

14.5 Environmental hazards

hazardous to the aquatic environment

Environmentally hazardous substance (aquatic environment): Nickel dinitrate

14.6 Special precautions for user

There is no additional information.

14.7 Transport in bulk according to IMO instruments

The cargo is not intended to be carried in bulk.

14.8 Information for each of the UN Model Regulations

Transport informationNational regulationsAdditional information(UN RTDG)

UN number	2031
Class	8
Environmental hazards	Yes Hazardous to the aquatic environment
Packing group	II
Danger label(s)	8 Fish and tree

Special provisions (SP)	- UN RTDG
Excepted quantities (EQ)	E2 UN RTDG
Limited quantities (LQ)	1 L UN RTDG

International Maritime Dangerous Goods Code (IMDG) - Additional information

Proper shipping name	NITRIC ACID
Particulars in the shipper's declaration	UN2031, NITRIC ACID, 8, II, MARINE POLLUTANT
Marine pollutant	yes (hazardous to the aquatic environment)
Danger label(s)	8, "Fish and tree"

Excepted quantities (EQ)	E2
Limited quantities (LQ)	1 L
EmS	F-A, S-B
Stowage category	D
Segregation group	1 - Acids

International Civil Aviation Organization (ICAO-IATA/DGR) - Additional information

Proper shipping name	Nitric acid
Particulars in the shipper's declaration	UN2031, Nitric acid, 8, II
Environmental hazards	yes (hazardous to the aquatic environment)
Danger label(s)	8

Excepted quantities (EQ)	E2
Limited quantities (LQ)	0,5 L

SECTION 15: Regulatory information

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

There is no additional information.

National regulations(Australia)

Australian Inventory of Chemical Substances(AICS)

All ingredients are listed or exempt from listing.

Other information

Directive 94/33/EC on the protection of young people at work. Observe employment restrictions under the Maternity Protection Directive (92/85/EEC) for expectant or nursing mothers.

National inventories

Country	Inventory	Status
AU	AIIC	all ingredients are listed
CA	DSL	all ingredients are listed
CN	IECSC	all ingredients are listed
EU	ECSI	all ingredients are listed
EU	REACH Reg.	all ingredients are listed
JP	CSCL-ENCS	all ingredients are listed
KR	KECI	all ingredients are listed
MX	INSQ	all ingredients are listed
NZ	NZIoC	all ingredients are listed
PH	PICCS	all ingredients are listed
TR	CICR	not all ingredients are listed
TW	TCSI	all ingredients are listed
US	TSCA	all ingredients are listed

Legend

AIIC	Australian Inventory of Industrial Chemicals
CICR	Chemical Inventory and Control Regulation
CSCL-ENCS	List of Existing and New Chemical Substances (CSCL-ENCS)
DSL	Domestic Substances List (DSL)
ECSI	EC Substance Inventory (EINECS, ELINCS, NLP)
IECSC	Inventory of Existing Chemical Substances Produced or Imported in China
INSQ	National Inventory of Chemical Substances
KECI	Korea Existing Chemicals Inventory
NZIoC	New Zealand Inventory of Chemicals
PICCS	Philippine Inventory of Chemicals and Chemical Substances (PICCS)
REACH Reg.	REACH registered substances
TCSI	Taiwan Chemical Substance Inventory
TSCA	Toxic Substance Control Act

15.2 Chemical Safety Assessment

Chemical safety assessments for substances in this mixture were not carried out.

SECTION 16: Other information

Indication of changes (revised safety data sheet)

Alignment to regulation: Globally Harmonized System of Classification and Labelling of Chemicals ("Purple book").
Restructuring: section 9, section 14

Section	Former entry (text/value)	Actual entry (text/value)	Safety-relevant
2.1		Classification acc. to GHS: change in the listing (table)	yes
2.2		Hazard statements: change in the listing (table)	yes
2.2	Supplemental hazard information		yes
2.2		Supplemental hazard information: change in the listing (table)	yes
2.2	Hazardous ingredients for labelling: Cadmium nitrate, Nitric acid ...% [C ≤ 70 %], Lithium nitrate, Nickel dinitrate, Cobalt(II) nitrate hexahydrate	Hazardous ingredients for labelling: Cadmium nitrate, Nitric acid ...% [C ≤ 70 %], Nickel dinitrate, Calcium nitrate, Cobalt(II) nitrate hexahydrate	yes

Abbreviations and acronyms

Abbr.	Descriptions of used abbreviations
Acute Tox.	Acute toxicity
ATE	Acute Toxicity Estimate
BCF	Bioconcentration factor
BOD	Biochemical Oxygen Demand
Carc.	Carcinogenicity
CAS	Chemical Abstracts Service (service that maintains the most comprehensive list of chemical substances)
Ceiling-C	Ceiling value
COD	Chemical oxygen demand
DGR	Dangerous Goods Regulations (see IATA/DGR)
DNEL	Derived No-Effect Level
EC50	Effective Concentration 50 %. The EC50 corresponds to the concentration of a tested substance causing 50 % changes in response (e.g. on growth) during a specified time interval
EINECS	European Inventory of Existing Commercial Chemical Substances
ELINCS	European List of Notified Chemical Substances
EmS	Emergency Schedule
ErC50	≡ EC50: in this method, that concentration of test substance which results in a 50 % reduction in either growth (EbC50) or growth rate (ErC50) relative to the control
Eye Dam.	Seriously damaging to the eye
Eye Irrit.	Irritant to the eye

Abbr.	Descriptions of used abbreviations
GHS	"Globally Harmonized System of Classification and Labelling of Chemicals" developed by the United Nations
IARC	International Agency for Research on Cancer
IATA	International Air Transport Association
IATA/DGR	Dangerous Goods Regulations (DGR) for the air transport (IATA)
ICAO	International Civil Aviation Organization
ICAO-TI	Technical instructions for the safe transport of dangerous goods by air
IMDG	International Maritime Dangerous Goods Code
IMDG-Code	International Maritime Dangerous Goods Code
LC50	Lethal Concentration 50%: the LC50 corresponds to the concentration of a tested substance causing 50 % lethality during a specified time interval
LD50	Lethal Dose 50 %: the LD50 corresponds to the dose of a tested substance causing 50 % lethality during a specified time interval
log KOW	n-Octanol/water
Met. Corr.	Substance or mixture corrosive to metals
Muta.	Germ cell mutagenicity
NLP	No-Longer Polymer
NTP-RoC	National Toxicology Program: Report on Carcinogens
Ox. Liq.	Oxidising liquid
Ox. Sol.	Oxidising solid
PBT	Persistent, Bioaccumulative and Toxic
PNEC	Predicted No-Effect Concentration
ppm	Parts per million
Repr.	Reproductive toxicity
Resp. Sens.	Respiratory sensitisation
Skin Corr.	Corrosive to skin
Skin Irrit.	Irritant to skin
Skin Sens.	Skin sensitisation
STEL	Short-term exposure limit
STOT RE	Specific target organ toxicity - repeated exposure
TWA	Time-weighted average
UN RTDG	UN Recommendations on the Transport of Dangerous Good
vPvB	Very Persistent and very Bioaccumulative
WES	Safe Work Australia: Workplace exposure standards for airborne contaminants

Key literature references and sources for data

Safe Work Australia's Code of Practice for Labelling of Workplace Hazardous Chemicals (under WHS Regulations).

UN Recommendations on the Transport of Dangerous Good. International Maritime Dangerous Goods Code (IMDG). Dangerous Goods Regulations (DGR) for the air transport (IATA).

Classification procedure

Physical and chemical properties. The classification is based on tested mixture.
Health hazards. Environmental hazards. The method for classification of the mixture is based on ingredients of the mixture (additivity formula).

List of relevant phrases (code and full text as stated in section 2 and 3)

Code	Text
H272	May intensify fire; oxidiser.
H290	May be corrosive to metals.
H301	Toxic if swallowed.
H302	Harmful if swallowed.
H312	Harmful in contact with skin.
H314	Causes severe skin burns and eye damage.
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H318	Causes serious eye damage.
H319	Causes serious eye irritation.
H331	Toxic if inhaled.
H332	Harmful if inhaled.
H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H340	May cause genetic defects.
H341	Suspected of causing genetic defects.
H350	May cause cancer (if inhaled).
H350i	May cause cancer by inhalation.
H360D	May damage the unborn child.
H360F	May damage fertility.
H360FD	May damage fertility. May damage the unborn child.
H372	Causes damage to organs through prolonged or repeated exposure.

Disclaimer

This information is based upon the present state of our knowledge. This SDS has been compiled and is solely intended for this product.