

Safety data sheet Safety data sheet

acc. to Regulation (EC) No. 1907/2006 (REACH)



Multi-Element ICP-Standard Solution CR-23 ROTI®Star 21 elements in 5 % HNO₃

article number: 1YL5
Version: 1.0 en

date of compilation: 2023-01-19

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-23 ROTI®Star 21 elements in 5 % HNO₃**

Article number 1YL5

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

Relevant identified uses: Laboratory and analytical use
Laboratory chemical

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
National Poisons Information Service City Hospital	Dudley Rd	B187QH Birmingham	844 892 0111	

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification acc. to GHS

Section	Hazard class	Cat-egory	Hazard class and category	Hazard statement
2.16	Substance or mixture corrosive to metals	1	Met. Corr. 1	H290
3.2	Skin corrosion/irritation	1B	Skin Corr. 1B	H314
3.3	Serious eye damage/eye irritation	1	Eye Dam. 1	H318
3.4S	Skin sensitisation	1	Skin Sens. 1	H317

Safety data sheet Safety data sheet

acc. to Regulation (EC) No. 1907/2006 (REACH)



Multi-Element ICP-Standard Solution CR-23 ROTI®Star 21 elements in 5 % HNO₃

article number: 1YL5

Section	Hazard class	Cat-egory	Hazard class and category	Hazard statement
3.5	Germ cell mutagenicity	1B	Muta. 1B	H340
3.6	Carcinogenicity	1A	Carc. 1A	H350
3.7	Reproductive toxicity	1B	Repr. 1B	H360D
3.9	Specific target organ toxicity - repeated exposure	2	STOT RE 2	H373
4.1C	Hazardous to the aquatic environment - chronic hazard	2	Aquatic Chronic 2	H411

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. Delayed or immediate effects can be expected after short or long-term exposure. Spillage and fire water can cause pollution of watercourses.

2.2 Label elements

Labelling

Signal word

Danger

Pictograms

GHS05, GHS07,
GHS08, GHS09



Hazard statements

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
H350	May cause cancer
H360D	May damage the unborn child
H373	May cause damage to organs through prolonged or repeated exposure
H411	Toxic to aquatic life with long lasting effects

Precautionary statements

Precautionary statements - prevention

P280 Wear protective gloves/protective clothing/eye protection/face protection

For professional users only

Supplemental hazard information

EUH071 Corrosive to the respiratory tract.

Safety data sheet Safety data sheet

acc. to Regulation (EC) No. 1907/2006 (REACH)



Multi-Element ICP-Standard Solution CR-23 ROTI®Star 21 elements in 5 % HNO₃

article number: 1YL5

Hazardous ingredients for labelling:

Nickel dinitrate, Cadmium nitrate, Nitric acid ...% [C ≤ 70 %], Cobalt dinitrate

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 sub-stance	Identifier	Wt%	Classification acc. to GHS	Pictograms	Notes
Nitric acid ...% [C ≤ 70 %]	CAS No 7697-37-2 EC No 231-714-2 Index No 007-030-00-3	5	Ox. Liq. 3 / H272 Met. Corr. 1 / H290 Acute Tox. 3 / H331 Skin Corr. 1A / H314 Eye Dam. 1 / H318 EUH071		B(a) GHS-HC IOELV
nickel dinitrate	CAS No 13138-45-9 EC No 236-068-5 Index No 028-012-00-1	< 1	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 / H350i Repr. 1B / H360D STOT RE 1 / H372 Aquatic Acute 1 / H400 Aquatic Chronic 1 / H410		GHS-HC
cobalt dinitrate	CAS No 10141-05-6 EC No 233-402-1 Index No 027-009-00-2	< 1	Resp. Sens. 1 / H334 Skin Sens. 1 / H317 Muta. 2 / H341 Carc. 1B / H350i Repr. 1B / H360F Aquatic Acute 1 / H400 Aquatic Chronic 1 / H410		1(a) GHS-HC
copper dinitrate	CAS No 3251-23-8 EC No 221-838-5	< 1	Acute Tox. 4 / H302 Skin Irrit. 2 / H315 Eye Irrit. 2 / H319 Aquatic Acute 1 / H400 Aquatic Chronic 1 / H410		
Zinc nitrate	CAS No 7779-88-6 EC No 231-943-8	< 1	Ox. Sol. 2 / H272 Acute Tox. 4 / H302 Skin Irrit. 2 / H315 Eye Irrit. 2 / H319 STOT SE 3 / H335 Aquatic Acute 1 / H400 Aquatic Chronic 2 / H411		

Safety data sheet Safety data sheet

acc. to Regulation (EC) No. 1907/2006 (REACH)



Multi-Element ICP-Standard Solution CR-23 ROTI®Star 21 elements in 5 % HNO₃

article number: 1YL5

Name of substance	Identifier	Wt%	Classification acc. to GHS	Pictograms	Notes
Cadmium nitrate	CAS No 10325-94-7 EC No 233-710-6 Index No 048-014-00-6	< 1	Acute Tox. 3 / H301 Acute Tox. 4 / H312 Acute Tox. 4 / H332 Muta. 1B / H340 Carc. 1B / H350 STOT RE 1 / H372 Aquatic Acute 1 / H400 Aquatic Chronic 1 / H410	 	GHS-HC IARC: 1 RoC "Known"
barium nitrate	CAS No 10022-31-8 EC No 233-020-5 Index No 056-002-00-7	< 1	Ox. Sol. 2 / H272 Acute Tox. 3 / H301 Acute Tox. 4 / H332 Eye Irrit. 2 / H319	 	1(a) A(a) GHS-HC
Arsenic acid	CAS No 7778-39-4 EC No 231-901-9 Index No 033-005-00-1	< 1	Acute Tox. 3 / H301 Acute Tox. 3 / H331 Carc. 1A / H350 Aquatic Acute 1 / H400 Aquatic Chronic 1 / H410	 	GHS-HC IOELV
Mercury(II) nitrate	CAS No 10045-94-0 EC No 233-152-3 Index No 080-002-00-6	< 1	Acute Tox. 2 / H300 Acute Tox. 1 / H310 Acute Tox. 2 / H330 STOT RE 2 / H373 Aquatic Acute 1 / H400 Aquatic Chronic 1 / H410	 	1(a) A(a) GHS-HC
Lead(II) nitrate	CAS No 10099-74-8 EC No 233-245-9 Index No 082-001-00-6	< 1	Acute Tox. 4 / H302 Acute Tox. 4 / H332 Repr. 1A / H360Df STOT RE 1 / H372 Aquatic Acute 1 / H400 Aquatic Chronic 1 / H410	 	1(a) A(a) GHS-HC IARC: 2A IOELV
Selenious acid	CAS No 7783-00-8 EC No 231-974-7 Index No 034-002-00-8	< 1	Acute Tox. 3 / H301 Acute Tox. 3 / H331 STOT RE 2 / H373 Aquatic Acute 1 / H400 Aquatic Chronic 1 / H410	 	A GHS-HC

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
- A(a): The name of substance is a general description. It is required that the correct name is stated on the label
- A: Without prejudice to Article 17(2), the name of the substance must appear on the label in the form of one of the designations given in Part 3. In Part 3, use is sometimes made of a general description such as '... compounds' or '... salts'. In this case, the supplier is required to state on the label the correct name, due account being taken of section 1.1.1.4.
- B(a): The classification refers to an aqueous solution
- GHS-HC: Harmonised classification (the classification of the substance corresponds to the entry in the list according to 1272/2008/EC, Annex VI)
- IARC: 1: IARC group 1: carcinogenic to humans (International Agency for Research on Cancer)
- IARC: 2A: IARC group 2A: probably carcinogenic to humans (International Agency for Research on Cancer)
- 2A:
- IOELV: Substance with a community indicative occupational exposure limit value
- RoC NTP-RoC: Known To Be A Human Carcinogen
- "Known"
- :

Safety data sheet Safety data sheet

acc. to Regulation (EC) No. 1907/2006 (REACH)



Multi-Element ICP-Standard Solution CR-23 ROTI®Star 21 elements in 5 % HNO₃

article number: 1YL5

Name of sub-stance	Identifier	Specific Conc. Limits	M-Factors	ATE	Exposure route
Nitric acid ...% [C ≤ 70 %]	CAS No 7697-37-2 EC No 231-714-2	Ox. Liq. 3; H272: C ≥ 65 % Skin Corr. 1A; H314: C ≥ 20 % Skin Corr. 1B; H314: 5 % ≤ C < 20 %	-	2,65 mg/l/4h	inhalation: va- pour
nickel dinitrate	CAS No 13138-45-9 EC No 236-068-5	Skin Irrit. 2; H315: C ≥ 20 % Skin Sens. 1; H317: C ≥ 0,01 % STOT RE 1; H372: C ≥ 1 % STOT RE 2; H373: 0,1 % ≤ C < 1 %	M-factor (acute) = 1 M-factor (chronic) = 1	1.620 mg/kg 1,5 mg/l/4h	oral inhalation: dust/ mist
cobalt dinitrate	CAS No 10141-05-6 EC No 233-402-1	Carc. 1B; H350i: C ≥ 0,01 %	M-factor (acute) = 10 M-factor (chronic) = 10	-	
copper dinitrate	CAS No 3251-23-8 EC No 221-838-5	-	-	794 mg/kg	oral
Zinc nitrate	CAS No 7779-88-6 EC No 231-943-8	-	-	>300 mg/kg	oral
Cadmium nitrate	CAS No 10325-94-7 EC No 233-710-6	Carc. 1B; H350: C ≥ 0,01 %	M-factor (acute) = 10 M-factor (chronic) = 10	147 mg/kg 1.100 mg/kg 1,5 mg/l/4h	oral dermal inhalation: dust/ mist
barium nitrate	CAS No 10022-31-8 EC No 233-020-5	-	-	>50 mg/kg 1,5 mg/l/4h	oral inhalation: dust/ mist
Arsenic acid	CAS No 7778-39-4 EC No 231-901-9	-	-	141,4 mg/kg 3 mg/l/4h 0,794 mg/l/4h	oral inhalation: va- pour inhalation: dust/ mist
Lead(II) nitrate	CAS No 10099-74-8 EC No 233-245-9	Repr. 1A; H360D: C ≥ 0,3 % Repr. 2; H361f: C ≥ 2,5 % STOT RE 2; H373: C ≥ 0,5 %	M-factor (acute) = 10	500 mg/kg 1,5 mg/l/4h	oral inhalation: dust/ mist
Mercury(II) ni- trate	CAS No 10045-94-0 EC No 233-152-3	STOT RE 2; H373: C ≥ 0,1 %	-	5 mg/kg 5 mg/kg 0,05 mg/l/4h	oral dermal inhalation: dust/ mist
Selenious acid	CAS No 7783-00-8 EC No 231-974-7	-	-	100 mg/kg 0,5 mg/l/4h	oral inhalation: dust/ mist

Safety data sheet Safety data sheet

acc. to Regulation (EC) No. 1907/2006 (REACH)



Multi-Element ICP-Standard Solution CR-23 ROTI®Star 21 elements in 5 % HNO₃

article number: 1YL5

Substance of Very High Concern (SVHC)					
Name of substance	Name acc. to inventory	CAS No	EC No	Listed in	Remarks
Lead(II) nitrate	lead dinitrate	10099-74-8	233-245-9	Candidate list	Repr. A57c
cobalt dinitrate	cobalt dinitrate	10141-05-6	233-402-1	Candidate list	Carc. A57a Repr. A57c
Cadmium nitrate	cadmium nitrate	10325-94-7	233-710-6	Candidate list	Carc. A57a Muta. A57b STOT-re A57(f)-HH
Arsenic acid	arsenic acid	7778-39-4	231-901-9	Annex XIV	Carc. 1A

Legend

annex XIV	List of substances subject to authorisation
candidate list	Substances meeting the criteria referred to in Article 57 and for eventual inclusion in Annex XIV
Carc. 1A	Carcinogenic (category 1A)
Carc. A57a	Carcinogenic (article 57a)
Muta. A57b	Mutagenic (article 57b)
Repr. A57c	Toxic for reproduction (article 57c)
STOT-re A57(f)-HH	Specific target organ toxicity - repeated exposure (article 57(f) - human health)

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. In case of skin reactions, consult a physician.

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). In case of accident or unwellness, seek medical advice immediately (show directions for use or safety data sheet if possible).

4.2 Most important symptoms and effects, both acute and delayed

Corrosion, Gastric perforation, Risk of serious damage to eyes, Risk of blindness, Cough, Dyspnoea, Pulmonary oedema, Allergic reactions

Safety data sheet Safety data sheet

acc. to Regulation (EC) No. 1907/2006 (REACH)



Multi-Element ICP-Standard Solution CR-23 ROTI®Star 21 elements in 5 % HNO₃

article number: 1YL5

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 (CO₂)

Unsuitable extinguishing media

water jet

5.2 Special hazards arising from the substance or mixture

Non-combustible.

Hazardous combustion products

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

5.3 Advice for firefighters

In case of fire and/or explosion do not breathe fumes. Do not allow firefighting water to enter drains or water courses. 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. Retain contaminated washing water and dispose of it. 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.

Safety data sheet Safety data sheet

acc. to Regulation (EC) No. 1907/2006 (REACH)



Multi-Element ICP-Standard Solution CR-23 ROTI®Star 21 elements in 5 % HNO₃

article number: 1YL5

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

Provide adequate ventilation as well as local exhaust at critical locations. Handle and open container with care. Avoid exposure. Clear contaminated areas thoroughly.

Measures to protect the environment

Avoid release to the environment.

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

Store in a well-ventilated place. Keep container tightly closed. Keep only in original container. May cause decomposition by long-term light influence.

Incompatible substances or mixtures

Observe hints for combined storage.

Protect against external exposure, such as

UV-radiation/sunlight, contact with air/oxygen

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/m ³]	STEL [ppm]	STEL [mg/m ³]	Ceiling-C [ppm]	Ceiling-C [mg/m ³]	Notation	Source
EU	lead compounds		IOELV		0,15						2022/431/EU
EU	nickel compounds	13138-45-9	IOELV		0,05					i, cmr _N icomp ₂	2022/431/EU
EU	nickel compounds	13138-45-9	IOELV		0,01					r, cmr _N icomp	2022/431/EU
EU	nitric acid	7697-37-2	IOELV			1	2,6				2006/15/EC

Safety data sheet Safety data sheet

acc. to Regulation (EC) No. 1907/2006 (REACH)



Multi-Element ICP-Standard Solution CR-23 ROTI®Star 21 elements in 5 % HNO₃

article number: 1YL5

Country	Name of agent	CAS No	Identifier	TWA [ppm]	TWA [mg/m ³]	STEL [ppm]	STEL [mg/m ³]	Ceiling-C [ppm]	Ceiling-C [mg/m ³]	Notation	Source
EU	arsenic acid	7778-39-4	IOELV		0,01					i, As-limit	2019/983/EU
GB	lead compounds		OEL-NIR		0,15					Pb	CLWR-NIR
GB	lead compounds		OEL		0,15					Pb	CLWR
GB	cobalt compounds		WEL		0,1					Co	EH40/2005
GB	selenium compounds		WEL		0,1					Se	EH40/2005
GB	nickel, soluble compounds	13138-45-9	WEL		0,1					Ni	EH40/2005
GB	nitric acid	7697-37-2	WEL			1	2,6				EH40/2005
GB	arsenic compounds	7778-39-4	WEL		0,1					As	EH40/2005

Notation

As Calculated as As (arsenic)

As-limit For the copper smelting sector, the limit value shall apply from 11 July 2023

Ceiling-C Ceiling value is a limit value above which exposure should not occur

cmr_Nicomp The limit value shall apply from 18 January 2025

cmr_Nicomp The limit value shall apply from 18 January 2025. Until then a limit value of 0,1 mg/m³ shall apply.

2

Co Calculated as Co (cobalt)

i Inhalable fraction

Ni Calculated as Ni (nickel)

Pb Calculated as Pb (lead)

r Respirable fraction

Se Calculated as Se (selenium)

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)

Biological limit values

Country	Name of agent	CAS No	Parameter	Notation	Identifier	Value	Material	Source
GB	lead compounds		lead	Pb-bio-2, Pb-med-2, wmn<45y	AL_NIR	250 µg/l	whole blood	CLWR-NIR
GB	lead compounds		lead	Pb-bio-2, Pb-med-2, wmn<45y	AL	250 µg/l	whole blood	CLWR

Safety data sheet Safety data sheet

acc. to Regulation (EC) No. 1907/2006 (REACH)



Multi-Element ICP-Standard Solution CR-23 ROTI®Star 21 elements in 5 % HNO₃

article number: 1YL5

Country	Name of agent	CAS No	Parameter	Notation	Identifier	Value	Material	Source
GB	lead compounds		lead	Pb-bio-2, Pb-med-3, wmn>45y, men	AL_NIR	400 µg/l	whole blood	CLWR-NIR
GB	lead compounds		lead	Pb-bio-2, Pb-med-3, wmn>45y, men	AL	400 µg/l	whole blood	CLWR
GB	lead compounds		lead	Pb-bio-2, Pb-med-4, young	AL_NIR	500 µg/l	whole blood	CLWR-NIR
GB	lead compounds		lead	Pb-bio-2, Pb-med-4, young	AL	500 µg/l	whole blood	CLWR

Notation

Pb-bio-2	Biological monitoring: (a) in respect of an employee other than a young person or a woman of reproductive capacity, at least every 6 months, but where the results of the measurements for individuals or for groups of workers have shown on the previous two consecutive occasions on which monitoring was carried out a lead in air exposure greater than 0.075 mg/m ³ but less than 0.100 mg/m ³ and where the blood-lead concentration of any individual employee is less than 30 µg/dl, the frequency of monitoring may be reduced to once a year; or (b) in respect of any young person or a woman of reproductive capacity, at such intervals as the relevant doctor shall specify, being not greater than 3 months
Pb-med-2	Medical surveillance: in respect of a woman of reproductive capacity, 20 g/dl (blood-lead concentration) or 20 g Pb/g creatinine (urinary lead concentration)
Pb-med-3	Medical surveillance: in respect of any other employee, 35 µg/dl (blood-lead concentration) or 40 µg Pb/g creatinine (urinary lead concentration) suspension level: in respect of a woman of reproductive capacity, 60 µg/dl (blood-lead concentration) or 110 µg Pb/g creatinine (urinary lead concentration)
Pb-med-4	Medical surveillance: in respect of any other employee, 35 µg/dl (blood-lead concentration) or 40 µg Pb/g creatinine (urinary lead concentration) suspension level: in respect of a young person, 50 µg/dl (blood-lead concentration) or 110 µg Pb/g creatinine (urinary lead concentration)
wmn<45y	Women of reproductive capacity (women < 45 years)
wmn>45y, men	Women of non-reproductive capacity, men (women > 45 years)
young	Adolescents (young person < 18 years)

Relevant DNELs of components of the mixture

Name of substance	CAS No	Endpoint	Threshold level	Protection goal, route of exposure	Used in	Exposure time
Zinc nitrate	7779-88-6	DNEL	1 mg/m ³	human, inhalatory	worker (industry)	chronic - systemic effects
Zinc nitrate	7779-88-6	DNEL	8,3 mg/kg bw/day	human, dermal	worker (industry)	chronic - systemic effects
Cadmium nitrate	10325-94-7	DNEL	4 µg/m ³	human, inhalatory	worker (industry)	chronic - systemic effects

Safety data sheet Safety data sheet

acc. to Regulation (EC) No. 1907/2006 (REACH)



Multi-Element ICP-Standard Solution CR-23 ROTI®Star 21 elements in 5 % HNO₃

article number: 1YL5

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
barium nitrate	10022-31-8	DNEL	2,73 mg/m ³	human, inhalatory	worker (industry)	chronic - systemic effects
barium nitrate	10022-31-8	DNEL	8,141 mg/kg	human, dermal	worker (industry)	chronic - systemic effects
Arsenic acid	7778-39-4	DNEL	6 µg/m ³	human, inhalatory	worker (industry)	chronic - systemic effects
Arsenic acid	7778-39-4	DNEL	85 µg/kg	human, dermal	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
Zinc nitrate	7779-88-6	PNEC	20,6 µg/l	aquatic organisms	freshwater	short-term (single instance)
Zinc nitrate	7779-88-6	PNEC	6,1 µg/l	aquatic organisms	marine water	short-term (single instance)
Zinc nitrate	7779-88-6	PNEC	100 µg/l	aquatic organisms	sewage treatment plant (STP)	short-term (single instance)
Zinc nitrate	7779-88-6	PNEC	117,8 mg/kg	aquatic organisms	freshwater sediment	short-term (single instance)
Zinc nitrate	7779-88-6	PNEC	56,5 mg/kg	aquatic organisms	marine sediment	short-term (single instance)
Zinc nitrate	7779-88-6	PNEC	35,6 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)
barium nitrate	10022-31-8	PNEC	115 µg/l	aquatic organisms	freshwater	short-term (single instance)
barium nitrate	10022-31-8	PNEC	62,2 mg/l	aquatic organisms	sewage treatment plant (STP)	short-term (single instance)
barium nitrate	10022-31-8	PNEC	600 mg/kg	aquatic organisms	freshwater sediment	short-term (single instance)

Safety data sheet Safety data sheet

acc. to Regulation (EC) No. 1907/2006 (REACH)



Multi-Element ICP-Standard Solution CR-23 ROTI®Star 21 elements in 5 % HNO₃

article number: 1YL5

Relevant PNECs of components of the mixture						
Name of substance	CAS No	End-point	Threshold level	Organism	Environmental compartment	Exposure time
barium nitrate	10022-31-8	PNEC	207,7 mg/kg	terrestrial organisms	soil	short-term (single instance)
Arsenic acid	7778-39-4	PNEC	0,001 mg/l	aquatic organisms	freshwater	short-term (single instance)
Arsenic acid	7778-39-4	PNEC	0,001 mg/l	aquatic organisms	marine water	short-term (single instance)
Arsenic acid	7778-39-4	PNEC	0,42 mg/l	aquatic organisms	sewage treatment plant (STP)	short-term (single instance)
Arsenic acid	7778-39-4	PNEC	5 mg/kg	aquatic organisms	freshwater sediment	short-term (single instance)
Arsenic acid	7778-39-4	PNEC	6 mg/kg	aquatic organisms	marine sediment	short-term (single instance)
Arsenic acid	7778-39-4	PNEC	0,095 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

FKM (fluoro rubber), Butyl caoutchouc (butyl rubber)

• material thickness

0,5 mm

• breakthrough times of the glove material

Safety data sheet Safety data sheet

acc. to Regulation (EC) No. 1907/2006 (REACH)



Multi-Element ICP-Standard Solution CR-23 ROTI®Star 21 elements in 5 % HNO₃

article number: 1YL5

>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-P3 (against nitrous gases and particles, colour code: Blue/White).

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	clear
Odour	characteristic
Melting point/freezing point	not determined
Boiling point or initial boiling point and boiling range	~83 °C at 1.013 hPa
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
<u>Solubility(ies)</u>	
Water solubility	miscible in any proportion
<u>Partition coefficient</u>	
Partition coefficient n-octanol/water (log value):	not relevant (inorganic)
Vapour pressure	23 hPa at 20 °C
<u>Density and/or relative density</u>	
Density	~1,1 g/cm ³ at 20 °C

Safety data sheet Safety data sheet

acc. to Regulation (EC) No. 1907/2006 (REACH)



Multi-Element ICP-Standard Solution CR-23 ROTI®Star 21 elements in 5 % HNO₃

article number: 1YL5

Relative vapour density information on this property is not available

Particle characteristics not relevant (liquid)

Other safety parameters

Oxidising properties none

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

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: Acetone, Aldehydes, Alkali (lye), Alkali metals, Alcohols, Formic acid, Amines, Ammonia (NH₃), Aniline, Combustible materials, Dichloromethane, Alkaline earth metal, Acetic anhydride, Hydrazine, Hydrocarbons, Metal powder, Nitriles, Reducing agents, Strong alkali, Hydrogen peroxide,
=> Explosive properties

10.4 Conditions to avoid

UV-radiation/sunlight. Keep away from heat.

10.5 Incompatible materials

different metals

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.

Safety data sheet Safety data sheet

acc. to Regulation (EC) No. 1907/2006 (REACH)



Multi-Element ICP-Standard Solution CR-23 ROTI®Star 21 elements in 5 % HNO₃

article number: 1YL5

GHS of the United Nations, annex 4. May be harmful if swallowed or in contact with skin.

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
nickel dinitrate	13138-45-9	oral	1.620 mg _{kg}
nickel dinitrate	13138-45-9	inhalation: dust/mist	1,5 mg _l /4h
copper dinitrate	3251-23-8	oral	794 mg _{kg}
Zinc nitrate	7779-88-6	oral	>300 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
barium nitrate	10022-31-8	oral	>50 mg _{kg}
barium nitrate	10022-31-8	inhalation: dust/mist	1,5 mg _l /4h
Arsenic acid	7778-39-4	oral	141,4 mg _{kg}
Arsenic acid	7778-39-4	inhalation: vapour	3 mg _l /4h
Arsenic acid	7778-39-4	inhalation: dust/mist	0,794 mg _l /4h
Lead(II) nitrate	10099-74-8	oral	500 mg _{kg}
Lead(II) nitrate	10099-74-8	inhalation: dust/mist	1,5 mg _l /4h
Mercury(II) nitrate	10045-94-0	oral	5 mg _{kg}
Mercury(II) nitrate	10045-94-0	dermal	5 mg _{kg}
Mercury(II) nitrate	10045-94-0	inhalation: dust/mist	0,05 mg _l /4h
Selenious acid	7783-00-8	oral	100 mg _{kg}
Selenious acid	7783-00-8	inhalation: dust/mist	0,5 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
nickel dinitrate	13138-45-9	oral	LD50	1.620 mg _{kg}	rat
copper dinitrate	3251-23-8	oral	LD50	794 mg _{kg}	rat
Zinc nitrate	7779-88-6	oral	LD50	>300 mg _{kg}	rat
Zinc nitrate	7779-88-6	dermal	LD50	>2.000 mg _{kg}	rat
Cadmium nitrate	10325-94-7	oral	LD50	147 mg _{kg}	rat

Safety data sheet Safety data sheet

acc. to Regulation (EC) No. 1907/2006 (REACH)



Multi-Element ICP-Standard Solution CR-23 ROTI®Star 21 elements in 5 % HNO₃

article number: 1YL5

Acute toxicity of components of the mixture					
Name of substance	CAS No	Exposure route	Endpoint	Value	Species
barium nitrate	10022-31-8	oral	LD50	>50 – <300 mg/kg	rat
barium nitrate	10022-31-8	dermal	LD50	>2.000 mg/kg	rat
Arsenic acid	7778-39-4	oral	LD50	141,4 mg/kg	mouse
Arsenic acid	7778-39-4	inhalation: dust/mist	LC50	0,794 mg/l/4h	mouse
Arsenic acid	7778-39-4	dermal	LD50	2.300 mg/kg	rabbit
Lead(II) nitrate	10099-74-8	oral	LD50	>2.000 mg/kg	rat
Lead(II) nitrate	10099-74-8	dermal	LD50	>2.000 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.

Reproductive toxicity

May damage the unborn child.

Specific target organ toxicity - single exposure

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

Specific target organ toxicity - repeated exposure

May cause damage to organs through prolonged or 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, pulmonary oedema

Safety data sheet Safety data sheet

acc. to Regulation (EC) No. 1907/2006 (REACH)



Multi-Element ICP-Standard Solution CR-23 ROTI®Star 21 elements in 5 % HNO₃

article number: 1YL5

• If on skin

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

• Other information

none

11.2 Endocrine disrupting properties

None of the ingredients are listed.

11.3 Information on other hazards

There is no additional information.

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 substance	CAS No	Endpoint	Value	Species	Exposure time
Zinc nitrate	7779-88-6	LC50	315 µg/l	fish	96 h
Zinc nitrate	7779-88-6	EC50	2.140 µg/l	aquatic invertebrates	48 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
barium nitrate	10022-31-8	LC50	>3,5 mg/l	fish	96 h
barium nitrate	10022-31-8	EC50	≤18 mg/l	aquatic invertebrates	48 h
barium nitrate	10022-31-8	ErC50	>1,15 mg/l	algae	72 h
Arsenic acid	7778-39-4	LC50	141 mg/l	fish	24 h
Arsenic acid	7778-39-4	EC50	159 µg/l	algae	96 h
Lead(II) nitrate	10099-74-8	LC50	107 µg/l	fish	96 h
Lead(II) nitrate	10099-74-8	ErC50	35,9 µg/l	algae	48 h
Selenious acid	7783-00-8	LC50	2.060 µg/l	fish	96 h
Selenious acid	7783-00-8	EC50	1.120 µg/l	aquatic invertebrates	48 h
Selenious acid	7783-00-8	ErC50	44.240 µg/l	algae	72 h

Safety data sheet Safety data sheet

acc. to Regulation (EC) No. 1907/2006 (REACH)



Multi-Element ICP-Standard Solution CR-23 ROTI®Star 21 elements in 5 % HNO₃

article number: 1YL5

Aquatic toxicity (chronic) of components of the mixture

Name of substance	CAS No	Endpoint	Value	Species	Exposure time
Zinc nitrate	7779-88-6	EC50	0,22 mg/l	aquatic invertebrates	24 h
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
barium nitrate	10022-31-8	ErC50	>2,19 mg/l	algae	72 d
barium nitrate	10022-31-8	EC50	>1.000 mg/l	microorganisms	3 h
Arsenic acid	7778-39-4	LC50	141 mg/l	fish	24 h
Arsenic acid	7778-39-4	EC50	0,256 mg/l	algae	14 d

12.2 Persistence and 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
Zinc nitrate	7779-88-6	96,05		
barium nitrate	10022-31-8	68,4		

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

None of the ingredients are listed.

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. Avoid release to the environment. Refer to special instructions/safety data sheets.

Safety data sheet Safety data sheet

acc. to Regulation (EC) No. 1907/2006 (REACH)



Multi-Element ICP-Standard Solution CR-23 ROTI®Star 21 elements in 5 % HNO₃

article number: 1YL5

Waste treatment of containers/packagings

It is a dangerous waste; only packagings which are approved (e.g. acc. to ADR) may be used.

13.2 Relevant provisions relating to waste

The allocation of waste identity numbers/waste descriptions must be carried out according to the EEC, specific to the industry and process.

Properties of waste which render it hazardous

- HP 6 acute toxicity
- HP 7 carcinogenic
- HP 8 corrosive
- HP 10 toxic for reproduction
- HP 11 mutagenic
- HP 14 ecotoxic

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 or ID number

ADRRID	UN 2031
IMDG-Code	UN 2031
ICAO-TI	UN 2031

14.2 UN proper shipping name

ADRRID	NITRIC ACID
IMDG-Code	NITRIC ACID
ICAO-TI	Nitric acid

14.3 Transport hazard class(es)

ADRRID	8
IMDG-Code	8
ICAO-TI	8

14.4 Packing group

ADRRID	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

Provisions for dangerous goods (ADR) should be complied within the premises.

14.7 Maritime transport in bulk according to IMO instruments

The cargo is not intended to be carried in bulk.

Safety data sheet Safety data sheet

acc. to Regulation (EC) No. 1907/2006 (REACH)



Multi-Element ICP-Standard Solution CR-23 ROTI®Star 21 elements in 5 % HNO₃

article number: 1YL5

14.8 Information for each of the UN Model Regulations

Agreement concerning the International Carriage of Dangerous Goods by Road (ADR) Additional information

Proper shipping name	NITRIC ACID
Particulars in the transport document	UN2031, NITRIC ACID, 8, II, (E), environmentally hazardous
Classification code	C1
Danger label(s)	8, "Fish and tree"
Environmental hazards	yes (hazardous to the aquatic environment)
Excepted quantities (EQ)	E2
Limited quantities (LQ)	1 L
Transport category (TC)	2
Tunnel restriction code (TRC)	E
Hazard identification No	80
Emergency Action Code	2R

Regulations concerning the International Carriage of Dangerous Goods by Rail (RID) Additional information

Classification code	C1
Danger label(s)	8 Fish and tree
Environmental hazards	Yes Hazardous to water
Excepted quantities (EQ)	E2
Limited quantities (LQ)	1 L
Transport category (TC)	2
Hazard identification No	80

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"




Safety data sheet Safety data sheet

acc. to Regulation (EC) No. 1907/2006 (REACH)



Multi-Element ICP-Standard Solution CR-23 ROTI®Star 21 elements in 5 % HNO₃

article number: 1YL5

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

Relevant provisions of the European Union (EU)

Seveso Directive

2012/18/EU (Seveso III)			
No	Dangerous substance/hazard categories	Qualifying quantity (tonnes) for the application of lower and upper-tier requirements	Notes
E2	environmental hazards (hazardous to the aquatic environment, cat. 2)	200 500	57)

Notation

57) Hazardous to the Aquatic Environment in category Chronic 2

Deco-Paint Directive

VOC content	0 % 0 g/l
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Industrial Emissions Directive (IED)

VOC content	0 %
VOC content (Water content was discounted)	0 g/l

Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS)

none of the ingredients are listed

Safety data sheet Safety data sheet

acc. to Regulation (EC) No. 1907/2006 (REACH)



Multi-Element ICP-Standard Solution CR-23 ROTI®Star 21 elements in 5 % HNO₃

article number: 1YL5

Regulation concerning the establishment of a European Pollutant Release and Transfer Register (PRTR)

none of the ingredients are listed

Water Framework Directive (WFD)

List of pollutants (WFD)				
Name of substance	Name acc. to inventory	CAS No	Listed in	Remarks
Zinc nitrate	Substances which contribute to eutrophication (in particular, nitrates and phosphates)		a)	
Zinc nitrate	Metals and their compounds		a)	
barium nitrate	Substances which contribute to eutrophication (in particular, nitrates and phosphates)		a)	
barium nitrate	Metals and their compounds		a)	
Mercury(II) nitrate	mercury compounds		b)	HAZ
Mercury(II) nitrate	mercury compounds	7439-97-6	c)	
Mercury(II) nitrate	Substances which contribute to eutrophication (in particular, nitrates and phosphates)		a)	
Mercury(II) nitrate	Substances and preparations, or the breakdown products of such, which have been proved to possess carcinogenic or mutagenic properties or properties which may affect steroidogenic, thyroid, reproduction or other endocrine-related functions in or via the aquatic environment		a)	
Mercury(II) nitrate	Metals and their compounds		a)	
Lead(II) nitrate	lead compounds		b)	
Lead(II) nitrate	lead compounds	7439-92-1	c)	
Lead(II) nitrate	Substances which contribute to eutrophication (in particular, nitrates and phosphates)		a)	
Lead(II) nitrate	Substances and preparations, or the breakdown products of such, which have been proved to possess carcinogenic or mutagenic properties or properties which may affect steroidogenic, thyroid, reproduction or other endocrine-related functions in or via the aquatic environment		a)	
Lead(II) nitrate	Metals and their compounds		a)	
cobalt dinitrate	Substances which contribute to eutrophication (in particular, nitrates and phosphates)		a)	

Safety data sheet Safety data sheet

acc. to Regulation (EC) No. 1907/2006 (REACH)



Multi-Element ICP-Standard Solution CR-23 ROTI®Star 21 elements in 5 % HNO₃

article number: 1YL5

List of pollutants (WFD)				
Name of substance	Name acc. to inventory	CAS No	Listed in	Remarks
cobalt dinitrate	Substances and preparations, or the breakdown products of such, which have been proved to possess carcinogenic or mutagenic properties or properties which may affect steroidogenic, thyroid, reproduction or other endocrine-related functions in or via the aquatic environment		a)	
cobalt dinitrate	Metals and their compounds		a)	
Cadmium nitrate	cadmium compounds		b)	HAZ
Cadmium nitrate	Cadmium and its compounds (depending on water hardness classes)	7440-43-9	c)	
Cadmium nitrate	Substances which contribute to eutrophication (in particular, nitrates and phosphates)		a)	
Cadmium nitrate	Substances and preparations, or the breakdown products of such, which have been proved to possess carcinogenic or mutagenic properties or properties which may affect steroidogenic, thyroid, reproduction or other endocrine-related functions in or via the aquatic environment		a)	
Cadmium nitrate	Metals and their compounds		a)	
nickel dinitrate	nickel compounds		b)	
nickel dinitrate	nickel compounds	7440-02-0	c)	
nickel dinitrate	Substances which contribute to eutrophication (in particular, nitrates and phosphates)		a)	
nickel dinitrate	Substances and preparations, or the breakdown products of such, which have been proved to possess carcinogenic or mutagenic properties or properties which may affect steroidogenic, thyroid, reproduction or other endocrine-related functions in or via the aquatic environment		a)	
nickel dinitrate	Metals and their compounds		a)	
copper dinitrate	Substances which contribute to eutrophication (in particular, nitrates and phosphates)		a)	
copper dinitrate	Metals and their compounds		a)	

Safety data sheet Safety data sheet

acc. to Regulation (EC) No. 1907/2006 (REACH)



Multi-Element ICP-Standard Solution CR-23 ROTI®Star 21 elements in 5 % HNO₃

article number: 1YL5

List of pollutants (WFD)				
Name of substance	Name acc. to inventory	CAS No	Listed in	Remarks
Arsenic acid	Substances and preparations, or the breakdown products of such, which have been proved to possess carcinogenic or mutagenic properties or properties which may affect steroidogenic, thyroid, reproduction or other endocrine-related functions in or via the aquatic environment		a)	
Arsenic acid	Arsenic and its compounds		a)	

Legend

- A) Indicative list of the main pollutants
- B) List of priority substances in the field of water policy
- C) Environmental Quality Standards for Priority Substances and certain other pollutants
- HAZ Identified as priority hazardous substance

Regulation on the marketing and use of explosives precursors

Explosives precursors which are subject to restrictions						
Name of substance	CAS No	Wt%	Type of registration	Re- marks	Limit value	Upper limit value for the purpose of licens- ing un- der Art- icle 5(3)
Nitric acid ...% [C ≤ 70 %]	7697-37-2	5	Annex I		3 % w/w	10 % w/w

Legend

- annex I Substances which shall not be made available to members of the general public on their own, or in mixtures or substances including them, except if the concentration is equal to or lower than the limit values set out below

Additional statements

If the product is passed on to third parties, in accordance with Article 7 "Notification of the supply chain" of Regulation EU 2019/1148, the information obligation is subject to the entire supply chain and all other provisions mentioned in Article 7 on restricted and regulated raw materials.

Regulation on drug precursors

none of the ingredients are listed

Regulation on substances that deplete the ozone layer (ODS)

none of the ingredients are listed

Regulation concerning the export and import of hazardous chemicals (PIC)

chemicals subject to the international prior informed consent (PIC) procedure (the 'PIC procedure').

Safety data sheet Safety data sheet

acc. to Regulation (EC) No. 1907/2006 (REACH)



Multi-Element ICP-Standard Solution CR-23 ROTI®Star 21 elements in 5 % HNO₃

article number: 1YL5

Name of substance	Name acc. to inventory	CAS No	Wt%	Category / subcategory	Use limitation
Mercury(II) nitrate	mercury(II) nitrate	10045-94-0	0,16		
Lead(II) nitrate	lead compounds		0,16	i(2)	sr
Cadmium nitrate	cadmium compounds		0,21	i(1) i(2)	sr sr
Arsenic acid	arsenic compounds		0,19	p(2)	sr

Legend

i(1) Sub-category: i(1) - industrial chemical for professional use
i(2) Sub-category: i(2) - industrial chemical for public use
p(2) Sub-category: p(2) - other pesticide including biocides
sr Use limitation: severe restriction (for the sub-category or sub-categories concerned) according to Union legislation

Regulation on persistent organic pollutants (POP)

none of the ingredients are listed

National regulations(GB)

List of substances subject to authorisation (GB REACH, Annex 14) / SVHC - candidate list

Substance of Very High Concern (SVHC) acc. to GB REACH and HSE			
Name of substance	CAS No	Listed in	Remarks
Arsenic acid	7778-39-4	Annex XIV	Carc. A57a

Legend

Annex XIV List of substances subject to authorisation
Carc. A57a Carcinogenic (Article 57a)

Restrictions according to GB REACH, Annex 17

Dangerous substances with restrictions (GB REACH, Annex 17)			
Name of substance	Name acc. to inventory	CAS No	No
Multi-Element	this product meets the criteria for classification in accordance with Regulation No 1272/2008/EC		3
Arsenic acid	Arsenic compounds		19
Arsenic acid	Arsenic compounds		72
Arsenic acid	carcinogenic		28

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.

Safety data sheet Safety data sheet

acc. to Regulation (EC) No. 1907/2006 (REACH)



Multi-Element ICP-Standard Solution CR-23 ROTI®Star 21 elements in 5 % HNO₃

article number: 1YL5

National inventories

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

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
ISHA-ENCS	Inventory of Existing and New Chemical Substances (ISHA-ENCS)
KECI	Korea Existing Chemicals Inventory
NDSL	Non-domestic Substances List (NDSL)
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

Abbreviations and acronyms

Abbr.	Descriptions of used abbreviations
2006/15/EC	Commission Directive establishing a second list of indicative occupational exposure limit values in implementation of Council Directive 98/24/EC and amending Directives 91/322/EEC and 2000/39/EC
2019/983/EU	Directive of the European Parliament and of the Council amending Directive 2004/37/EC on the protection of workers from the risks related to exposure to carcinogens or mutagens at work
2022/431/EU	Directive (EU) 2022/431 of the European Parliament and of the Council of 9 March 2022 amending Directive 2004/37/EC on the protection of workers from the risks related to exposure to carcinogens or mutagens at work

Safety data sheet Safety data sheet

acc. to Regulation (EC) No. 1907/2006 (REACH)



Multi-Element ICP-Standard Solution CR-23 ROTI®Star 21 elements in 5 % HNO₃

article number: 1YL5

Abbr.	Descriptions of used abbreviations
Acute Tox.	Acute toxicity
ADR	Accord relatif au transport international des marchandises dangereuses par route (Agreement concerning the International Carriage of Dangerous Goods by Road)
Aquatic Acute	Hazardous to the aquatic environment - acute hazard
Aquatic Chronic	Hazardous to the aquatic environment - chronic hazard
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
CLWR	Control of Lead at Work Regulations
CLWR-NIR	Control of Lead at Work Regulations (Northern Ireland)
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
EC No	The EC Inventory (EINECS, ELINCS and the NLP-list) is the source for the seven-digit EC number, an identifier of substances commercially available within the EU (European Union)
EH40/2005	EH40/2005 Workplace exposure limits (http://www.nationalarchives.gov.uk/doc/open-government-licence/)
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
GB REACH	The REACH etc. (Amendment etc.) (EU Exit) Regulations 2019, SI 2019/758 (as amended)
GHS	"Globally Harmonized System of Classification and Labelling of Chemicals" developed by the United Nations
HSE	Health and Safety Executive
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

Safety data sheet Safety data sheet

acc. to Regulation (EC) No. 1907/2006 (REACH)



Multi-Element ICP-Standard Solution CR-23 ROTI®Star 21 elements in 5 % HNO₃

article number: 1YL5

Abbr.	Descriptions of used abbreviations
IMDG	International Maritime Dangerous Goods Code
IMDG-Code	International Maritime Dangerous Goods Code
index No	The Index number is the identification code given to the substance in Part 3 of Annex VI to Regulation (EC) No 1272/2008
IOELV	Indicative occupational exposure limit value
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
M-factor	Means a multiplying factor. It is applied to the concentration of a substance classified as hazardous to the aquatic environment acute category 1 or chronic category 1, and is used to derive by the summation method the classification of a mixture in which the substance is present
Muta.	Germ cell mutagenicity
NLP	No-Longer Polymer
NTP-RoC	National Toxicology Program: Report on Carcinogens
OEL	Workplace exposure limit
Ox. Liq.	Oxidising liquid
Ox. Sol.	Oxidising solid
PBT	Persistent, Bioaccumulative and Toxic
PNEC	Predicted No-Effect Concentration
ppm	Parts per million
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals
Repr.	Reproductive toxicity
Resp. Sens.	Respiratory sensitisation
RID	Règlement concernant le transport International ferroviaire des marchandises Dangereuses (Regulations concerning the International carriage of Dangerous goods by Rail)
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
STOT SE	Specific target organ toxicity - single exposure
TWA	Time-weighted average
VOC	Volatile Organic Compounds
vPvB	Very Persistent and very Bioaccumulative
WEL	Workplace exposure limit

Safety data sheet Safety data sheet

acc. to Regulation (EC) No. 1907/2006 (REACH)



Multi-Element ICP-Standard Solution CR-23 ROTI®Star 21 elements in 5 % HNO₃

article number: 1YL5

Key literature references and sources for data

Agreement concerning the International Carriage of Dangerous Goods by Road (ADR). Regulations concerning the International Carriage of Dangerous Goods by Rail (RID). 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.
H300	Fatal if swallowed.
H301	Toxic if swallowed.
H302	Harmful if swallowed.
H310	Fatal in contact with skin.
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.
H330	Fatal if inhaled.
H331	Toxic if inhaled.
H332	Harmful if inhaled.
H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H335	May cause respiratory irritation.
H340	May cause genetic defects.
H341	Suspected of causing genetic defects.
H350	May cause cancer.
H350i	May cause cancer by inhalation.
H360D	May damage the unborn child.
H360Df	May damage the unborn child. Suspected of damaging fertility.
H360F	May damage fertility.
H372	Causes damage to organs through prolonged or repeated exposure.
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.

Safety data sheet Safety data sheet

acc. to Regulation (EC) No. 1907/2006 (REACH)



Multi-Element ICP-Standard Solution CR-23 ROTI®Star 21 elements in 5 % HNO₃

article number: 1YL5

Code	Text
H411	Toxic to aquatic life with long lasting effects.

Disclaimer

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