

# Safety data sheet

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



## Cerium(III) nitrate hexahydrate ROTI®METIC 99,999 % (5N)

article number: **5312**  
Version: **4.0 en**  
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Version: (3)

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Revision: 2024-03-02

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

### 1.1 Product identifier

Identification of the substance	<b>Cerium(III) nitrate hexahydrate ROTI®METIC 99,999 % (5N)</b>
Article number	5312
EC number	233-297-2
CAS number	10294-41-4

### 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 private purposes (household). Food, drink and animal feedingstuffs.

### 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](mailto:sicherheit@carlroth.de)

**Website:** [www.carlroth.de](http://www.carlroth.de)

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

**e-mail (competent person):** [sicherheit@carlroth.de](mailto: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
2.14	Oxidising solid	2	Ox. Sol. 2	H272
3.3	Serious eye damage/eye irritation	1	Eye Dam. 1	H318
4.1A	Hazardous to the aquatic environment - acute hazard	1	Aquatic Acute 1	H400

# Safety data sheet

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



## Cerium(III) nitrate hexahydrate ROTI®METIC 99,999 % (5N)

article number: 5312

Section	Hazard class	Cat-egory	Hazard class and category	Hazard statement
4.1C	Hazardous to the aquatic environment - chronic hazard	1	Aquatic Chronic 1	H410

For full text of abbreviations: see SECTION 16

### The most important adverse physicochemical, human health and environmental effects

Spillage and fire water can cause pollution of watercourses.

## 2.2 Label elements

### Labelling

#### Signal word

**Danger**

#### Pictograms

GHS03, GHS05,  
GHS09



#### Hazard statements

H272 May intensify fire; oxidiser  
H318 Causes serious eye damage  
H410 Very toxic to aquatic life with long lasting effects

#### Precautionary statements

##### Precautionary statements - prevention

P220 Keep away from clothing as well as other incompatible materials  
P273 Avoid release to the environment  
P280 Wear protective gloves/eye protection/face protection

##### Precautionary statements - response

P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing  
P310 Immediately call a POISON CENTER/doctor

## 2.3 Other hazards

### Results of PBT and vPvB assessment

According to the results of its assessment, this substance is not a PBT or a vPvB.

### Endocrine disrupting properties

Does not contain an endocrine disruptor (ED) at a concentration of  $\geq 0,1\%$ .

# Safety data sheet

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



**Cerium(III) nitrate hexahydrate ROTI®METIC 99,999 % (5N)**

article number: **5312**

## SECTION 3: Composition/information on ingredients

### 3.1 Substances

Name of substance	Cerium(III) nitrate hexahydrate
Molecular formula	$Ce(NO_3)_3 \cdot 6 H_2O$
Molar mass	434,2 $g/mol$
CAS No	10294-41-4
EC No	233-297-2

## SECTION 4: First aid measures

### 4.1 Description of first aid measures



#### General notes

Take off contaminated clothing.

#### Following inhalation

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

#### Following skin contact

Rinse skin with water/shower. In all cases of doubt, or when symptoms persist, seek medical advice.

#### 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.

#### Following ingestion

Rinse mouth. Call a doctor if you feel unwell.

### 4.2 Most important symptoms and effects, both acute and delayed

Risk of blindness, Risk of serious damage to eyes

### 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, foam, alcohol resistant foam, dry extinguishing powder, ABC-powder

#### Unsuitable extinguishing media

water jet

# Safety data sheet

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



**Cerium(III) nitrate hexahydrate ROTI®METIC 99,999 % (5N)**

article number: **5312**

## 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 (NO<sub>x</sub>)

## 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.

## 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 dust.

### 6.2 Environmental precautions

Keep away from drains, surface and ground water. Retain contaminated washing water and dispose of it. If substance has entered a water course or sewer, inform the responsible authority.

### 6.3 Methods and material for containment and cleaning up

#### Advice on how to contain a spill

Covering of drains. Take up mechanically.

#### Advice on how to clean up a spill

Take up mechanically. Control of dust.

#### 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

Avoid dust formation.

#### Measures to prevent fire as well as aerosol and dust generation

Keep away from combustible material.

#### 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 dry place. Keep container tightly closed. Hygroscopic solid.

# Safety data sheet

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



## Cerium(III) nitrate hexahydrate ROTI®METIC 99,999 % (5N)

article number: 5312

### Incompatible substances or mixtures

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

### Protect against external exposure, such as

high temperatures, humidity, 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)

This information is not available.

#### Environmental values

Relevant PNECs and other threshold levels				
End-point	Threshold level	Organism	Environmental compartment	Exposure time
PNEC	0,13 µg/l	aquatic organisms	freshwater	short-term (single instance)
PNEC	0,013 µg/l	aquatic organisms	marine water	short-term (single instance)
PNEC	9,1 mg/l	aquatic organisms	sewage treatment plant (STP)	short-term (single instance)
PNEC	17,1 mg/kg	aquatic organisms	freshwater sediment	short-term (single instance)
PNEC	1,71 mg/kg	aquatic organisms	marine sediment	short-term (single instance)
PNEC	0,451 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.

##### Skin protection



# Safety data sheet

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



## Cerium(III) nitrate hexahydrate ROTI®METIC 99,999 % (5N)

article number: 5312

### • hand protection

Wear suitable gloves. Chemical protection gloves are suitable, which are tested according to EN 374. 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: Dust formation. Particulate filter device (EN 143). P1 (filters at least 80 % of airborne particles, colour code: 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	solid
Form	crystalline
Colour	white
Odour	faintly perceptible
Melting point/freezing point	>57 °C (Release of crystal water)
Boiling point or initial boiling point and boiling range	not determined
Flammability	non-combustible
Lower and upper explosion limit	not determined
Flash point	not applicable
Auto-ignition temperature	>400 °C (ECHA)
Decomposition temperature	140 °C at 982 hPa (ECHA)

# Safety data sheet

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



## Cerium(III) nitrate hexahydrate ROTI®METIC 99,999 % (5N)

article number: 5312

pH (value)	3,7 (in aqueous solution: 100 g/l, 25 °C)
Kinematic viscosity	not relevant
<u>Solubility(ies)</u>	
Water solubility	>600 g/l (ECHA)
<u>Partition coefficient</u>	
Partition coefficient n-octanol/water (log value):	not relevant (inorganic)
Vapour pressure	not determined
<u>Density and/or relative density</u>	
Density	not determined
Relative vapour density	Information on this property is not available.
Particle characteristics	No data available.
<u>Other safety parameters</u>	
Oxidising properties	oxidiser
<b>9.2 Other information</b>	
Information with regard to physical hazard classes:	There is no additional information.
Other safety characteristics:	There is no additional information.

## SECTION 10: Stability and reactivity

### 10.1 Reactivity

It's a reactive substance. Oxidising property.

### 10.2 Chemical stability

Moisture-sensitive. Hygroscopic solid.

### 10.3 Possibility of hazardous reactions

**Violent reaction with:** Cyanides, Reducing agents, Strong alkali, Strong acid

### 10.4 Conditions to avoid

Keep away from heat. Decomposition takes place from temperatures above: 140 °C at 982 hPa. Protect from moisture.

### 10.5 Incompatible materials

combustible materials

### 10.6 Hazardous decomposition products

Hazardous combustion products: see section 5.

# Safety data sheet

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



**Cerium(III) nitrate hexahydrate ROTI®METIC 99,999 % (5N)**

article number: **5312**

## SECTION 11: Toxicological information

### 11.1 Information on toxicological effects

#### Classification acc. to GHS

##### Acute toxicity

Shall not be classified as acutely toxic.

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

Acute toxicity					
Exposure route	Endpoint	Value	Species	Method	Source
oral	LD50	4.200 mg/kg	rat		ECHA
dermal	LD50	>2.000 mg/kg	rat		ECHA

##### Skin corrosion/irritation

Shall not be classified as corrosive/irritant to skin.

##### Serious eye damage/eye irritation

Causes serious eye damage.

##### Respiratory or skin sensitisation

Shall not be classified as a respiratory or skin sensitiser.

##### Germ cell mutagenicity

Shall not be classified as germ cell mutagenic.

##### Carcinogenicity

Shall not be classified as carcinogenic.

##### 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

Data are not available.

##### • If in eyes

Causes serious eye damage, risk of blindness

##### • If inhaled

Data are not available.

##### • If on skin

Data are not available.



# Safety data sheet

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



## Cerium(III) nitrate hexahydrate ROTI®METIC 99,999 % (5N)

article number: 5312

### • Other information

none

### 11.2 Endocrine disrupting properties

Does not contain an endocrine disruptor (ED) at a concentration of  $\geq 0,1\%$ .

### 11.3 Information on other hazards

There is no additional information.

## SECTION 12: Ecological information

### 12.1 Toxicity

Very toxic to aquatic life with long lasting effects.

Aquatic toxicity (acute)				
Endpoint	Value	Species	Source	Exposure time
LC50	0,13 mg/l	rainbow trout	ECHA	96 h
EC50	6,9 mg/l	daphnia magna	ECHA	48 h
ErC50	0,63 mg/l	algae	ECHA	72 h

### 12.2 Persistence and degradability

Data are not available.

### 12.3 Bioaccumulative potential

Data are not available.

### 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

Does not contain an endocrine disruptor (ED) at a concentration of  $\geq 0,1\%$ .

### 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

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



## Cerium(III) nitrate hexahydrate ROTI®METIC 99,999 % (5N)

article number: 5312

### Waste treatment of containers/packagings

It is a dangerous waste; only packagings which are approved (e.g. acc. to ADR) may be used. Handle contaminated packages in the same way as the substance itself. Completely emptied packages can be recycled.

### 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 2** oxidising  
**HP 4** irritant - skin irritation and eye damage  
**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. Non-contaminated packages may be recycled.

## SECTION 14: Transport information

### 14.1 UN number or ID number

ADRRID	UN 1477
IMDG-Code	UN 1477
ICAO-TI	UN 1477

### 14.2 UN proper shipping name

ADRRID	NITRATES, INORGANIC, N.O.S.
IMDG-Code	NITRATES, INORGANIC, N.O.S.
ICAO-TI	Nitrates, inorganic, n.o.s.

### 14.3 Transport hazard class(es)

ADRRID	5.1
IMDG-Code	5.1
ICAO-TI	5.1

### 14.4 Packing group

ADRRID	II
IMDG-Code	II
ICAO-TI	II

### 14.5 Environmental hazards

hazardous to the aquatic environment

### 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.

### 14.8 Information for each of the UN Model Regulations

# Safety data sheet

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



## Cerium(III) nitrate hexahydrate ROTI®METIC 99,999 % (5N)

article number: 5312

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

Proper shipping name	NITRATES, INORGANIC, N.O.S.
Particulars in the transport document	UN1477, NITRATES, INORGANIC, N.O.S., 5.1, II, (E), environmentally hazardous
Classification code	O2
Danger label(s)	5.1, "Fish and tree"



Environmental hazards	yes (hazardous to the aquatic environment)
Special provisions (SP)	511
Excepted quantities (EQ)	E2
Limited quantities (LQ)	1 kg
Transport category (TC)	2
Tunnel restriction code (TRC)	E
Hazard identification No	50
<b>Emergency Action Code</b>	1Y

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

<b>Classification code</b>	O2
<b>Danger label(s)</b>	5.1, "Fish and tree"



<b>Environmental hazards</b>	Yes Hazardous to water
<b>Special provisions (SP)</b>	511
<b>Excepted quantities (EQ)</b>	E2
<b>Limited quantities (LQ)</b>	1 kg
<b>Transport category (TC)</b>	2
<b>Hazard identification No</b>	50

### International Maritime Dangerous Goods Code (IMDG) - Additional information

Proper shipping name	NITRATES, INORGANIC, N.O.S.
Particulars in the shipper's declaration	UN1477, NITRATES, INORGANIC, N.O.S., 5.1, II, MARINE POLLUTANT
Marine pollutant	yes (hazardous to the aquatic environment)
Danger label(s)	5.1, "Fish and tree"



Special provisions (SP)	-
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# Safety data sheet

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



## Cerium(III) nitrate hexahydrate ROTI®METIC 99,999 % (5N)

article number: 5312

Excepted quantities (EQ)	E2
Limited quantities (LQ)	1 kg
EmS	F-A, S-Q
Stowage category	A

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

Proper shipping name	Nitrates, inorganic, n.o.s.
Particulars in the shipper's declaration	UN1477, Nitrates, inorganic, n.o.s., 5.1, II
Environmental hazards	YES (hazardous to the aquatic environment)
Danger label(s)	5.1



Special provisions (SP)	A3
Excepted quantities (EQ)	E2
Limited quantities (LQ)	2,5 kg

## 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
P8	oxidising liquids and solids	50                      200	55)

##### Notation

55) Oxidising liquids, category 1, 2 or 3, or oxidising solids, category 1, 2 or 3

##### Deco-Paint Directive

VOC content	0 %
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##### Industrial Emissions Directive (IED)

VOC content	0 %
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##### Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS)

not listed

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

not listed

# Safety data sheet

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



## Cerium(III) nitrate hexahydrate ROTI®METIC 99,999 % (5N)

article number: 5312

### Water Framework Directive (WFD)

List of pollutants (WFD)				
Name of substance	Name acc. to inventory	CAS No	Listed in	Remarks
Cerium(III) nitrate hexahydrate	Substances which contribute to eutrophication (in particular, nitrates and phosphates)		a)	
Cerium(III) nitrate hexahydrate	Metals and their compounds		a)	

#### Legend

a) Indicative list of the main pollutants

### Regulation on the marketing and use of explosives precursors

not listed

### Regulation on drug precursors

not listed

### Regulation on substances that deplete the ozone layer (ODS)

not listed

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

not listed

### Regulation on persistent organic pollutants (POP)

not listed

### National regulations(GB)

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

not listed

#### Restrictions according to GB REACH, Annex 17

not listed

### 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	substance is listed
CA	DSL	substance is listed
CN	IECSC	substance is listed
EU	ECSI	substance is listed
EU	REACH Reg.	substance is listed
JP	CSCL-ENCS	substance is listed
KR	KECI	substance is listed
NZ	NZIoC	substance is listed
PH	PICCS	substance is listed
TW	TCSI	substance is listed

# Safety data sheet

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



## Cerium(III) nitrate hexahydrate ROTI®METIC 99,999 % (5N)

article number: 5312

Country	Inventory	Status
US	TSCA	substance is listed (ACTIVE)
VN	NCI	substance is listed

### Legend

AIIC	Australian Inventory of Industrial Chemicals
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
KECI	Korea Existing Chemicals Inventory
NCI	National Chemical 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

No Chemical Safety Assessment has been carried out for this substance.

## SECTION 16: Other information

### Indication of changes (revised safety data sheet)

Section	Former entry (text/value)	Actual entry (text/value)	Safety-relevant
2.2	Labelling of packages where the contents do not exceed 125 ml: Signal word: Danger		yes
2.2		Labelling of packages where the contents do not exceed 125 ml: change in the listing (table)	yes
2.2		Labelling of packages where the contents do not exceed 125 ml: change in the listing (table)	yes
2.2		Labelling of packages where the contents do not exceed 125 ml: change in the listing (table)	yes
2.3		Endocrine disrupting properties: Does not contain an endocrine disruptor (ED) at a concentration of $\geq 0,1\%$ .	yes
14.8	Classification code: 5.1	Classification code: O2	yes
15.1	Restrictions according to REACH, Annex XVII		yes
15.1		Dangerous substances with restrictions (REACH, Annex XVII): change in the listing (table)	yes
15.1	List of substances subject to authorisation (REACH, Annex XIV)/SVHC - candidate list: Not listed.		yes
15.1		National regulations(GB)	yes
15.1		List of substances subject to authorisation (GB REACH, Annex 14) / SVHC - candidate list: not listed	yes

# Safety data sheet

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



## Cerium(III) nitrate hexahydrate ROTI®METIC 99,999 % (5N)

article number: 5312

Section	Former entry (text/value)	Actual entry (text/value)	Safety-relevant
15.1		Restrictions according to GB REACH, Annex 17: not listed	yes
15.1		National inventories: change in the listing (table)	yes

### Abbreviations and acronyms

Abbr.	Descriptions of used abbreviations
ADR	Accord relatif au transport international des marchandises dangereuses par route (Agreement concerning the International Carriage of Dangerous Goods by Road)
CAS	Chemical Abstracts Service (service that maintains the most comprehensive list of chemical substances)
DGR	Dangerous Goods Regulations (see IATA/DGR)
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)
ED	Endocrine disruptor
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
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
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
NLP	No-Longer Polymer
PBT	Persistent, Bioaccumulative and Toxic
PNEC	Predicted No-Effect Concentration
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals
RID	Règlement concernant le transport International ferroviaire des marchandises Dangereuses (Regulations concerning the International carriage of Dangerous goods by Rail)

# Safety data sheet

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



## Cerium(III) nitrate hexahydrate ROTI®METIC 99,999 % (5N)

article number: 5312

Abbr.	Descriptions of used abbreviations
VOC	Volatile Organic Compounds
vPvB	Very Persistent and very Bioaccumulative

### 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).

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

Code	Text
H272	May intensify fire; oxidiser.
H318	Causes serious eye damage.
H400	Very toxic to aquatic life.
H410	Very 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.