

## SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Version 11.5  
Revision Date 20.11.2024  
Print Date 21.11.2024  
GENERIC EU MSDS - NO COUNTRY SPECIFIC DATA - NO OEL DATA

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

#### 1.1 Product identifiers

Product name : ICP multi-element standard solution IV  
Certipur®

Product Number : 1.11355

Catalogue No. : 111355

Brand : Millipore

UFI : 4350-X60Y-999H-VTSY

REACH No. :

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

Identified uses : Laboratory chemicals, Manufacture of substances

Uses advised against : This product is not intended for consumer use.

#### 1.3 Details of the supplier of the safety data sheet

Company :

#### 1.4 Emergency telephone

Emergency Phone # : +(44)-870-8200418 (CHEMTREC (GB))  
+(353)-19014670 (CHEMTREC Ireland)  
001-803-017-9114 (CHEMTREC India)

### SECTION 2: Hazards identification

#### 2.1 Classification of the substance or mixture

Corrosive to Metals, (Category 1) H290: May be corrosive to metals.

Skin corrosion, (Sub-category 1B) H314: Causes severe skin burns and eye damage.

Serious eye damage, (Category 1) H318: Causes serious eye damage.

Skin sensitization, (Category 1) H317: May cause an allergic skin reaction.

Germ cell mutagenicity, (Category 1B) H340: May cause genetic defects.

Carcinogenicity, (Category 1B) H350: May cause cancer.



Reproductive toxicity, (Category 1B)	H360FD: May damage fertility. May damage the unborn child.
Specific target organ toxicity - repeated exposure, (Category 2)	H373: May cause damage to organs through prolonged or repeated exposure.
Short-term (acute) aquatic hazard, (Category 1)	H400: Very toxic to aquatic life.
Long-term (chronic) aquatic hazard, (Category 2)	H411: Toxic to aquatic life with long lasting effects.

## 2.2 Label elements

### Labelling according Regulation (EC) No 1272/2008

#### Pictogram



#### Signal Word

Danger

#### 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.
H360FD	May damage fertility. May damage the unborn child.
H373	May cause damage to organs through prolonged or repeated exposure.
H410	Very toxic to aquatic life with long lasting effects.

#### Precautionary Statements

P202	Do not handle until all safety precautions have been read and understood.
P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water.
P304 + P340 + P310	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/ doctor.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

#### Supplemental Hazard information (EU)

EUH071 Corrosive to the respiratory tract.

Restricted to professional users.

"As from 24 August 2023 adequate training is required before industrial or professional use."

### Reduced Labeling (<= 125 ml)

#### Pictogram



Signal Word	Danger
Hazard Statements	
H317	May cause an allergic skin reaction.
H340	May cause genetic defects.
H350	May cause cancer.
H314	Causes severe skin burns and eye damage.
H360FD	May damage fertility. May damage the unborn child.
Precautionary Statements	
P202	Do not handle until all safety precautions have been read and understood.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water.
P304 + P340 + P310	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/ doctor.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
Supplemental Hazard information (EU)	
EUH071	Corrosive to the respiratory tract.

### 2.3 Other hazards

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

Ecological information:

The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

Toxicological information:

The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

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## SECTION 3: Composition/information on ingredients

### 3.2 Mixtures

Component	Classification	Concentration	
<b>nitric acid</b>			
CAS-No. EC-No. Index-No. Registration number	7697-37-2 231-714-2 007-030-00-3 01-2119487297-23- XXXX	Ox. Liq. 3; Met. Corr. 1; Acute Tox. 3; Skin Corr. 1A; Eye Dam. 1; H272, H290, H331, H314, H318 Concentration limits: >= 1 %: Met. Corr. 1, H290; >= 65 %: Ox. Liq. 3, H272; >= 20 %: Skin Corr. 1A, H314; 5 - < 20 %: Skin Corr. 1B, H314; >= 3 %: Eye Dam. 1,	>= 5 - < 10 %



	H318; 1 - < 3 %: Eye Irrit. 2, H319; 1 - < 5 %: Skin Irrit. 2, H315; Acute inhalation toxicity(vapor): 2.65 mg/l	
<b>boric acid</b> Included in the Candidate List of Substances of Very High Concern (SVHC) according to Regulation (EC) No. 1907/2006 (REACH)		
CAS-No. EC-No. Index-No. Registration number	10043-35-3 233-139-2 005-007-00-2 01-2119486683-25-XXXX	Repr. 1B; H360FD >= 0.3 - < 1 %
<b>Chromium(III) nitrate</b>		
CAS-No. EC-No.	13548-38-4 236-921-1 *	Ox. Sol. 3; Acute Tox. 4; Skin Irrit. 2; Eye Irrit. 2; Skin Sens. 1B; Aquatic Chronic 2; H272, H302, H315, H319, H317, H411 >= 0.25 - < 1 %
<b>nickel(II) nitrate</b>		
CAS-No. EC-No. Index-No.	13138-45-9 236-068-5 028-012-00-1 *	Ox. Sol. 2; Acute Tox. 4; Skin Irrit. 2; Eye Dam. 1; Resp. Sens. 1; Skin Sens. 1; Muta. 2; Carc. 1B; Repr. 1B; STOT RE 1; Aquatic Acute 1; Aquatic Chronic 1; H272, H302, H332, H315, H318, H334, H317, H341, H350i, H360D, H372, H400, H410 Concentration limits: >= 1 %: STOT RE 1, H372; 0.1 - < 1 %: STOT RE 2, H373; >= 20 %: Skin Irrit. 2, H315; >= 0.01 %: Skin Sens. 1, H317; M-Factor - Aquatic Acute: 1 - Aquatic Chronic: 1 >= 0.25 - < 0.3 %
<b>Cobalt(II) nitrate</b> Included in the Candidate List of Substances of Very High Concern (SVHC) according to Regulation (EC) No. 1907/2006 (REACH)		
CAS-No. EC-No. Index-No.	10141-05-6 233-402-1 027-009-00-2 *	Ox. Sol. 2; Acute Tox. 4; Eye Dam. 1; Resp. Sens. 1; Skin Sens. 1; Muta. 2; Carc. 1B; Repr. 1B; STOT RE 2; Aquatic Acute 1; Aquatic Chronic 1; H272, H302, H318, H334, H317, H341, H350i, H360FD, H373, H400, H410 Concentration limits: >= 0.25 - < 0.3 %



		>= 0.01 %: Carc. 1B, H350i; M-Factor - Aquatic Acute: 10 - Aquatic Chronic: 1	
<b>Copper(II) nitrate</b>			
CAS-No. EC-No. Registration number	3251-23-8 221-838-5 01-2119969290-34-XXXX	Ox. Sol. 2; Skin Corr. 1B; Eye Dam. 1; Aquatic Acute 1; Aquatic Chronic 2; H272, H314, H318, H400, H411 M-Factor - Aquatic Acute: 1	>= 0.25 - < 1 %
<b>Zinc nitrate</b>			
CAS-No. EC-No.	7779-88-6 231-943-8 *	Ox. Sol. 2; Acute Tox. 4; Skin Irrit. 2; Eye Irrit. 2; STOT SE 3; Aquatic Acute 1; Aquatic Chronic 2; H272, H302, H315, H319, H335, H400, H411 M-Factor - Aquatic Acute: 1	>= 0.25 - < 1 %
<b>Cadmium nitrate</b> Included in the Candidate List of Substances of Very High Concern (SVHC) according to Regulation (EC) No. 1907/2006 (REACH)			
CAS-No. EC-No. Index-No.	10325-94-7 233-710-6 048-001-00-5 *	Acute Tox. 3; Acute Tox. 2; Acute Tox. 4; Muta. 1B; Carc. 1B; Repr. 1B; STOT RE 1; Aquatic Acute 1; Aquatic Chronic 1; H301, H330, H312, H340, H350, H360FD, H372, H400, H410 Concentration limits: >= 0.01 %: Carc. 1B, H350; >= 7 %: STOT RE 1, H372; 0.1 - < 7 %: STOT RE 2, H373; M-Factor - Aquatic Acute: 10 - Aquatic Chronic: 1	>= 0.1 - < 0.25 %
<b>Lead(II) nitrate</b> Included in the Candidate List of Substances of Very High Concern (SVHC) according to Regulation (EC) No. 1907/2006 (REACH)			
CAS-No. EC-No. Index-No. Registration number	10099-74-8 233-245-9 082-001-00-6 01-2119492475-28-XXXX	Acute Tox. 4; Eye Dam. 1; Skin Sens. 1B; Carc. 2; Repr. 1A; STOT RE 1; Aquatic Acute 1; Aquatic Chronic 1; H302, H332, H318, H317, H351, H360Df, H372, H400, H410 Concentration limits:	>= 0.1 - < 0.25 %



		>= 2.5 %: Repr. 2, H361f; >= 0.5 %: STOT RE 2, H373; M-Factor - Aquatic Acute: 10 - Aquatic Chronic: 1	
<b>Silver nitrate</b>			
CAS-No.	7761-88-8	Ox. Sol. 2; Met. Corr. 1; Skin Corr. 1A; Eye Dam. 1; Repr. 1B; Aquatic Acute 1; Aquatic Chronic 1; H272, H290, H314, H318, H360D, H400, H410 Concentration limits: >= 1 %: Met. Corr. 1, H290; 68 %: Ox. Sol. 2, H272; M-Factor - Aquatic Acute: 1,000 - Aquatic Chronic: 100	>= 0.1 - < 0.25 %
<b>Thallium(I) nitrate</b>			
CAS-No.	10102-45-1	Ox. Sol. 3; Acute Tox. 2; STOT RE 2; Aquatic Chronic 2; H272, H300, H330, H373, H411	>= 0.1 - < 0.25 %

\*A registration number is not available for this substance as the substance or its use are exempted from registration according to Article 2 REACH Regulation (EC) No 1907/2006, or the annual tonnage does not require a registration.

For the full text of the H-Statements mentioned in this Section, see Section 16.

## SECTION 4: First aid measures

### 4.1 Description of first-aid measures

#### General advice

First aiders need to protect themselves. Show this material safety data sheet to the doctor in attendance.

#### If inhaled

After inhalation: fresh air. Call in physician.

#### In case of skin contact

In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/ shower. Call a physician immediately.

#### In case of eye contact

After eye contact: rinse out with plenty of water. Immediately call in ophthalmologist. Remove contact lenses.

#### If swallowed

After swallowing: make victim drink water (two glasses at most), avoid vomiting (risk of perforation). Call a physician immediately. Do not attempt to neutralise.



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

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

#### 4.3 Indication of any immediate medical attention and special treatment needed

No data available

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### SECTION 5: Firefighting measures

#### 5.1 Extinguishing media

##### **Suitable extinguishing media**

Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

##### **Unsuitable extinguishing media**

For this substance/mixture no limitations of extinguishing agents are given.

#### 5.2 Special hazards arising from the substance or mixture

Nitrogen oxides (NOx)

Not combustible.

Fire may cause evolution of:

nitrous gases, nitrogen oxides

Ambient fire may liberate hazardous vapours.

#### 5.3 Advice for firefighters

Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

#### 5.4 Further information

Suppress (knock down) gases/vapors/mists with a water spray jet. Prevent fire extinguishing water from contaminating surface water or the ground water system.

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### SECTION 6: Accidental release measures

#### 6.1 Personal precautions, protective equipment and emergency procedures

Advice for non-emergency personnel: Do not breathe vapors, aerosols. Avoid substance contact. Ensure adequate ventilation. Evacuate the danger area, observe emergency procedures, consult an expert.

For personal protection see section 8.

#### 6.2 Environmental precautions

Do not let product enter drains.

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

Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up carefully with liquid-absorbent material (e.g. Chemizorb®). Dispose of properly. Clean up affected area.

#### 6.4 Reference to other sections

For disposal see section 13.

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### SECTION 7: Handling and storage

#### 7.1 Precautions for safe handling

##### **Advice on safe handling**

Work under hood. Do not inhale substance/mixture. Avoid generation of vapours/aerosols.



## **Hygiene measures**

Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.  
For precautions see section 2.2.

## **7.2 Conditions for safe storage, including any incompatibilities**

### **Storage conditions**

No metal containers.

Protected from light.Tightly closed. Keep in a well-ventilated place. Keep locked up or in an area accessible only to qualified or authorized persons.

Recommended storage temperature see product label.

### **Storage class**

Storage class (TRGS 510): 6.1D: Non-combustible, acute toxic Cat.3 / toxic hazardous materials or hazardous materials causing chronic effects

## **7.3 Specific end use(s)**

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

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## **SECTION 8: Exposure controls/personal protection**

### **8.1 Control parameters**

#### **Ingredients with workplace control parameters**

### **8.2 Exposure controls**

#### **Personal protective equipment**

##### **Eye/face protection**

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

##### **Skin protection**

This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN 16523-1 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: [www.kcl.de](http://www.kcl.de)).

Full contact

Material: Latex gloves

Minimum layer thickness: 0.60 mm

Break through time: 480 min

Material tested:Lapren® (KCL 706 / Aldrich Z677558, Size M)

This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN 16523-1 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: [www.kcl.de](http://www.kcl.de)).

Splash contact

Material: Nitrile rubber

Minimum layer thickness: 0.40 mm

Break through time: 240 min



**Body Protection**

Acid-resistant protective clothing

**Respiratory protection**

Recommended Filter type: filter E-(P2)

The entrepreneur has to ensure that maintenance, cleaning and testing of respiratory protective devices are carried out according to the instructions of the producer. These measures have to be properly documented.

**Control of environmental exposure**

Do not let product enter drains.

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## **SECTION 9: Physical and chemical properties**

### **9.1 Information on basic physical and chemical properties**

a)	Physical state	liquid
b)	Color	blue
c)	Odor	weak
d)	Melting point/freezing point	No data available
e)	Initial boiling point and boiling range	No data available
f)	Flammability (solid, gas)	No data available
g)	Upper/lower flammability or explosive limits	No data available
h)	Flash point	Not applicable
i)	Autoignition temperature	Not applicable
j)	Decomposition temperature	No data available
k)	pH	ca.1 at 20 °C
l)	Viscosity	Viscosity, kinematic: No data available Viscosity, dynamic: No data available
m)	Water solubility	at 20 °C soluble
n)	Partition coefficient: n-octanol/water	No data available
o)	Vapor pressure	No data available
p)	Density	1.09 g/cm <sup>3</sup> at 20 °C
	Relative density	No data available
q)	Relative vapor density	No data available



r) Particle characteristics	
Particle Size Distribution	D <sub>50</sub> = 306.905 µm Type of distribution: volume distribution Measurement method: ISO 13320 Measurement technique: laser diffraction
r) Particle characteristics	No data available
s) Explosive properties	Not classified as explosive.
t) Oxidizing properties	none

## 9.2 Other safety information

No data available

## SECTION 10: Stability and reactivity

### 10.1 Reactivity

Oxidizing agents

### 10.2 Chemical stability

Sensitivity to light  
heat-sensitive

The product is chemically stable under standard ambient conditions (room temperature) .

### 10.3 Possibility of hazardous reactions

Risk of explosion with:

Risk of ignition or formation of inflammable gases or vapours with:

Metals

Alkali metals

Alkaline earth metals

metal alloys

metallic oxides

Alcohols

Aldehydes

Amines

anhydrides

anilines

Ammonia

alkalines

hydrides

halogen compounds

nonmetallic oxides

nonmetallic halides

nonmetallic hydrogen compounds

nonmetals

phosphides

nitrides

lithium silicide

hydrogen peroxide

organic combustible substances

oxidisable substances

organic solvent



Ketones  
Nitriles  
organic nitro compounds  
hydrazine and derivatives  
acetylidene  
Acids  
Fluorine  
Generates dangerous gases or fumes in contact with:  
Copper  
Mercury  
Violent reactions possible with:  
The generally known reaction partners of water.

#### **10.4 Conditions to avoid**

Strong heating.  
Moisture.  
no information available

#### **10.5 Incompatible materials**

Cellulose, Metals Contact with metals may lead to the formation of nitrous gases and hydrogen. Metals

#### **10.6 Hazardous decomposition products**

In the event of fire: see section 5

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### **SECTION 11: Toxicological information**

#### **11.1 Information on toxicological effects**

##### **Mixture**

##### **Acute toxicity**

Acute toxicity estimate Oral - > 2,000 mg/kg  
(Calculation method)

Symptoms: If ingested, severe burns of the mouth and throat, as well as a danger of perforation of the esophagus and the stomach.

Acute toxicity estimate Inhalation - 4 h - > 20 mg/l - vapor(Calculation method)

Symptoms: Possible symptoms:, mucosal irritations, Cough, Shortness of breath, Possible damages:, damage of respiratory tract

Dermal: No data available

##### **Skin corrosion/irritation**

Remarks: Mixture causes burns.

##### **Serious eye damage/eye irritation**

Remarks: Mixture causes serious eye damage.  
Risk of blindness!

##### **Respiratory or skin sensitization**

Mixture may cause an allergic skin reaction.

##### **Germ cell mutagenicity**

Possible mutagen

##### **Carcinogenicity**



Possible carcinogen.

#### **Reproductive toxicity**

May harm the unborn child.  
May impair fertility.

#### **Specific target organ toxicity - single exposure**

No data available

#### **Specific target organ toxicity - repeated exposure**

Mixture may cause damage to organs through prolonged or repeated exposure.

#### **Aspiration hazard**

No data available

### **11.2 Additional Information**

#### **Endocrine disrupting properties**

##### **Product:**

Assessment

The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

Other dangerous properties can not be excluded.

This substance should be handled with particular care.

Handle in accordance with good industrial hygiene and safety practice.

#### **Components**

##### **nitric acid**

###### **Acute toxicity**

Oral: No data available  
Acute toxicity estimate Inhalation - 2.65 mg/l - vapor  
(Acute toxicity estimate according to Regulation (EC) No. 1272/2008)  
Dermal: No data available

###### **Skin corrosion/irritation**

Skin - Rabbit  
Result: Causes severe burns.  
Remarks: (IUCLID)  
Remarks: Causes poorly healing wounds.

###### **Serious eye damage/eye irritation**

Eyes - Rabbit  
Result: Causes burns.  
Remarks: (IUCLID)  
Remarks: Causes serious eye damage.

###### **Respiratory or skin sensitization**

No data available



**Germ cell mutagenicity**

Test Type: Ames test

Test system: Salmonella typhimurium

Result: negative

**Carcinogenicity**

No data available

**Reproductive toxicity**

No data available

**Specific target organ toxicity - single exposure**

No data available

**Specific target organ toxicity - repeated exposure**

No data available

**Aspiration hazard**

No data available

**boric acid****Acute toxicity**

LD50 Oral - Rat - male and female - 3,450 mg/kg

Remarks: (ECHA)

LC50 Inhalation - Rat - male and female - 4 h - > 2.12 mg/l - dust/mist  
(OECD Test Guideline 403)

LD50 Dermal - Rabbit - male and female - > 2,000 mg/kg

Remarks: (ECHA)

**Skin corrosion/irritation**

Skin - Rabbit

Result: No skin irritation - 24 h

Remarks: (ECHA)

**Serious eye damage/eye irritation**

Eyes - Rabbit

Result: No eye irritation - 24 h

(OECD Test Guideline 405)

**Respiratory or skin sensitization**

Buehler Test - Guinea pig

Result: negative

(OECD Test Guideline 406)

**Germ cell mutagenicity**

Test Type: sister chromatid exchange assay

Test system: Chinese hamster ovary cells

Result: negative

Remarks: (ECHA)



Test Type: Ames test  
Test system: S. typhimurium  
Result: negative  
Test Type: In vitro mammalian cell gene mutation test  
Test system: mouse lymphoma cells  
Result: negative  
Test Type: Mutagenicity (mammal cell test):  
Test system: Chinese hamster ovary cells  
Result: negative  
Method: OECD Test Guideline 474  
Species: Mouse - male and female  
Result: negative

### **Carcinogenicity**

No data available

### **Reproductive toxicity**

May damage fertility.  
May damage the unborn child.

### **Specific target organ toxicity - single exposure**

No data available

### **Specific target organ toxicity - repeated exposure**

### **Aspiration hazard**

No data available

## **Chromium(III) nitrate**

### **Acute toxicity**

LD50 Oral - Rat - male and female - 1,410 - 1,540 mg/kg  
(OECD Test Guideline 401)

Inhalation: No data available  
Dermal: No data available

### **Skin corrosion/irritation**

No data available

### **Serious eye damage/eye irritation**

No data available

### **Respiratory or skin sensitization**

Maximization Test - Guinea pig

Result: positive

The product is a skin sensitizer, sub-category 1B.  
(OECD Test Guideline 406)

Remarks: The value is given in analogy to the following substances: chromium(III) chloride



**Germ cell mutagenicity**

Test Type: reverse mutation assay

Test system: Salmonella typhimurium

Result: negative

Test Type: sister chromatid exchange assay

Test system: Chinese hamster ovary cells

Result: negative

Test Type: Mutagenicity (mammal cell test): chromosome aberration.

Result: negative

Method: OECD Test Guideline 474

Species: Mouse - male

Result: negative

Remarks: The value is given in analogy to the following substances: Chromium trinitrate

**Carcinogenicity**

No data available

**Reproductive toxicity**

No data available

**Specific target organ toxicity - single exposure**

No data available

**Specific target organ toxicity - repeated exposure**

No data available

**Aspiration hazard**

No data available

**nickel(II) nitrate****Acute toxicity**

LD50 Oral - Rat - male - 325 mg/kg

(OECD Test Guideline 401)

Acute toxicity estimate Oral - 325 mg/kg

(ATE value derived from LD50/LC50 value)

LC50 Inhalation - Rat - male and female - 4 h - 1.3 - 4.5 mg/l - dust/mist

(OECD Test Guideline 403)

Acute toxicity estimate Inhalation - 1.5 mg/l - dust/mist

(ATE value derived from LD50/LC50 value)

Dermal: No data available

**Skin corrosion/irritation**

Skin - Rabbit

Result: Irritating to skin. - 4 h

(OECD Test Guideline 404)

**Serious eye damage/eye irritation**

Eyes - Rabbit

Result: Causes serious eye damage.

(OECD Test Guideline 405)

**Respiratory or skin sensitization**

Maximization Test - Guinea pig



Result: positive  
May cause an allergic skin reaction.  
(Maximization Test)

**Germ cell mutagenicity**  
Suspected of causing genetic defects.

**Carcinogenicity**  
May cause cancer by inhalation.

**Reproductive toxicity**  
May damage the unborn child.

**Specific target organ toxicity - single exposure**  
No data available

**Specific target organ toxicity - repeated exposure**  
Causes damage to organs through prolonged or repeated exposure.

**Aspiration hazard**  
No data available

## **Cobalt(II) nitrate**

**Acute toxicity**  
LD50 Oral - Rat - male and female - 978 mg/kg  
(OECD Test Guideline 401)

Remarks: (in analogy to similar compounds)  
The value is given in analogy to the following substances: Cobaltous nitrate, hexahydrate

Acute toxicity estimate Oral - 978 mg/kg  
(ATE value derived from LD50/LC50 value)

Inhalation: No data available

Dermal: No data available

### **Skin corrosion/irritation**

Skin - Rabbit  
Result: No skin irritation - 4 h  
(OECD Test Guideline 404)

### **Serious eye damage/eye irritation**

Eyes - Rabbit  
Result: Causes serious eye damage.  
(OECD Test Guideline 405)

### **Respiratory or skin sensitization**

May cause allergic skin reaction. Classified according to Regulation (EU) 1272/2008, Annex VI (Table 3.1/3.2)

May cause allergy or asthma symptoms or breathing difficulties if inhaled. Classified according to Regulation (EU) 1272/2008, Annex VI (Table 3.1/3.2)

**Germ cell mutagenicity**  
Suspected of causing genetic defects.

**Carcinogenicity**  
May cause cancer by inhalation.

**Reproductive toxicity**  
May damage the unborn child.  
May damage fertility.



**Specific target organ toxicity - single exposure**

No data available

**Specific target organ toxicity - repeated exposure**

Inhalation - May cause damage to organs through prolonged or repeated exposure.

- Lungs

**Aspiration hazard**

No data available

**Copper(II) nitrate****Acute toxicity**

Oral: No data available

Inhalation: No data available

Dermal: No data available

**Skin corrosion/irritation**

Skin - In vitro study

Result: Corrosive

(OECD Test Guideline 431)

**Serious eye damage/eye irritation**

Remarks: Causes serious eye damage.

**Respiratory or skin sensitization**

Maximization Test - Guinea pig

Result: negative

(OECD Test Guideline 406)

**Germ cell mutagenicity**

Test Type: Ames test

Test system: Salmonella typhimurium

Result: negative

Method: OECD Test Guideline 486

Species: Rat - male

Result: negative

Method: Regulation (EC) No. 440/2008, Annex, B.12

Species: Mouse - male and female

Result: negative

**Carcinogenicity**

No data available

**Reproductive toxicity**

No data available

**Specific target organ toxicity - single exposure**

No data available

**Specific target organ toxicity - repeated exposure**

No data available

**Aspiration hazard**

No data available



## Zinc nitrate

### Acute toxicity

LD50 Oral - Rat - female - 2,000 mg/kg

(OECD Test Guideline 423)

Remarks: (for the hexahydrate)

Inhalation: No data available

Dermal: No data available

### Skin corrosion/irritation

Skin - EPISKIN Human Skin Model Test

(OECD Test Guideline 439)

Remarks: (for the hexahydrate)

### Serious eye damage/eye irritation

Remarks: Causes serious eye irritation.

### Respiratory or skin sensitization

No data available

### Germ cell mutagenicity

No data available

### Carcinogenicity

No data available

### Reproductive toxicity

No data available

### Specific target organ toxicity - single exposure

May cause respiratory irritation.

### Specific target organ toxicity - repeated exposure

No data available

### Aspiration hazard

No data available

## Cadmium nitrate

### Acute toxicity

Acute toxicity estimate Oral - Not tested on animals - 100.1 mg/kg

(Expert judgment)

Acute toxicity estimate Inhalation - Not tested on animals - 0.051 mg/l - dust/mist  
(Expert judgment)

Acute toxicity estimate Dermal - Not tested on animals - 1,100.1 mg/kg  
(Expert judgment)

### Skin corrosion/irritation

No data available

### Serious eye damage/eye irritation

No data available

### Respiratory or skin sensitization

No data available

### Germ cell mutagenicity

May cause genetic defects.

In vivo tests showed mutagenic effects



Test Type: Ames test  
Test system: *Salmonella typhimurium*  
Result: negative  
Remarks: (in analogy to similar products)  
The value is given in analogy to the following substances: Cadmium chloride  
Test Type: comet assay  
Test system: mammalian cells  
Result: positive  
Remarks: (in analogy to similar products)  
The value is given in analogy to the following substances: cadmium sulphate  
Test Type: In vitro mammalian cell gene mutation test  
Test system: mammalian cells  
Result: positive  
Remarks: (in analogy to similar products)

### **Carcinogenicity**

Carcinogenicity - May cause cancer.  
Presumed to have carcinogenic potential for humans  
This is or contains a component that has been reported to be carcinogenic based on its IARC, OSHA, ACGIH, NTP, or EPA classification. Chronic exposure to cadmium may cause lung and prostate cancer. Presumed to have carcinogenic potential for humans

### **Reproductive toxicity**

May damage the unborn child.  
May damage fertility.

### **Specific target organ toxicity - single exposure**

No data available

### **Specific target organ toxicity - repeated exposure**

Oral - Causes damage to organs through prolonged or repeated exposure.  
- Kidney, Bone

### **Aspiration hazard**

No data available

## **Lead(II) nitrate**

### **Acute toxicity**

LD50 Oral - 500.1 mg/kg

Acute toxicity estimate Oral - 500.1 mg/kg  
(ATE value derived from LD50/LC50 value)

Acute toxicity estimate Inhalation - 1.6 mg/l - dust/mist  
(Expert judgment)

Symptoms: Possible damages:, mucosal irritations

LD50 Dermal - Rat - male and female - > 2,000 mg/kg  
(OECD Test Guideline 402)

Remarks: (in analogy to similar products)

The value is given in analogy to the following substances: Lead(II) oxide red

### **Skin corrosion/irritation**

Skin - In vitro study

Result: non-corrosive  
(OECD Test Guideline 431)

Skin - In vitro study

Result: No skin irritation - 42 min



(OECD Test Guideline 439)

**Serious eye damage/eye irritation**

Eyes - Bovine cornea

Result: Causes serious eye damage. - 4 h

(OECD Test Guideline 437)

**Respiratory or skin sensitization**

Local lymph node assay (LLNA) - Mouse

Result: positive

(OECD Test Guideline 429)

**Germ cell mutagenicity**

Test Type: Ames test

Test system: Salmonella typhimurium

Result: negative

Remarks: (in analogy to similar products)

(ECHA)

Species: Rat - female - Red blood cells (erythrocytes)

Result: positive

Remarks: (in analogy to similar products)

(ECHA)

The value is given in analogy to the following substances: lead(II) acetate

Species: Monkey - male - lymphocyte

Result: positive

Remarks: (in analogy to similar products)

(ECHA)

Species: Mouse - male - Liver cells

Result: negative

Remarks: (in analogy to similar products)

(ECHA)

**Carcinogenicity**

Suspected of causing cancer.

**Reproductive toxicity**

May damage the unborn child. Positive evidence from human epidemiological studies.

Suspected of damaging fertility.

**Specific target organ toxicity - single exposure**

Acute inhalation toxicity - Possible damages:, mucosal irritations

**Specific target organ toxicity - repeated exposure**

Causes damage to organs through prolonged or repeated exposure.

- Blood, Central nervous system, Immune system, Kidney

**Aspiration hazard**

No data available

**Silver nitrate**

**Acute toxicity**

Oral: No data available

Inhalation: No data available

Dermal: No data available



**Skin corrosion/irritation**

Skin - reconstructed human epidermis (RhE)

Result: Causes severe burns. - 3 - 60 min

(OECD Test Guideline 431)

**Serious eye damage/eye irritation**

Eyes - Rabbit

Result: Causes serious eye damage.

Remarks: (ECHA)

Remarks: Risk of permanent damage due to staining of the cornea.

**Respiratory or skin sensitization**

No data available

**Germ cell mutagenicity**

Test Type: Micronucleus test

Test system: Human lymphocytes

Result: negative

Test Type: In vitro mammalian cell gene mutation test

Test system: mouse lymphoma cells

Result: Positive results were obtained in some in vitro tests.

Method: OECD Test Guideline 474

Species: Rat - male and female

Result: Positive results were obtained in some in vivo tests.

**Carcinogenicity**

No data available

**Reproductive toxicity**

May damage the unborn child.

**Specific target organ toxicity - single exposure**

No data available

**Specific target organ toxicity - repeated exposure****Aspiration hazard**

No data available

**Thallium(I) nitrate****Acute toxicity**

Acute toxicity estimate Oral - 5.1 mg/kg

(Expert judgment)

Remarks: Classified according to Regulation (EU) 1272/2008, Annex VI (Table 3.1/3.2)

Acute toxicity estimate Inhalation - 4 h - 0.051 mg/l - dust/mist

(Expert judgment)

Remarks: Classified according to Regulation (EU) 1272/2008, Annex VI (Table 3.1/3.2)

Dermal: No data available

**Skin corrosion/irritation**

No data available

**Serious eye damage/eye irritation**

No data available

**Respiratory or skin sensitization**

No data available



**Germ cell mutagenicity**

No data available

**Carcinogenicity**

No data available

**Reproductive toxicity**

No data available

**Specific target organ toxicity - single exposure**

No data available

**Specific target organ toxicity - repeated exposure**

May cause damage to organs through prolonged or repeated exposure.

Remarks: Classified according to Regulation (EU) 1272/2008, Annex VI (Table 3.1/3.2)

**Aspiration hazard**

No data available

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**SECTION 12: Ecological information****12.1 Toxicity****Mixture**

No data available

**12.2 Persistence and degradability**

No data available

**12.3 Bioaccumulative potential**

No data available

**12.4 Mobility in soil**

No data available

**12.5 Results of PBT and vPvB assessment**

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

**12.6 Endocrine disrupting properties****Product:**

Assessment : The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

**12.7 Other adverse effects**

Hazard for drinking water supplies.

Caustic even in diluted form.

Harmful effect due to pH shift.

Discharge into the environment must be avoided.

**Components****nitric acid**

No data available



**boric acid**

Toxicity to fish	static test LC50 - <i>Pimephales promelas</i> (fathead minnow) - 79.7 mg/l - 96 h (US-EPA)
Toxicity to daphnia and other aquatic invertebrates	static test EC50 - <i>Daphnia magna</i> (Water flea) - 133 mg/l - 48 h Remarks: (ECOTOX Database)
Toxicity to algae	static test EC50 - <i>Pseudokirchneriella subcapitata</i> (green algae) - 52.4 mg/l - 74.5 h (OECD Test Guideline 201)

**Chromium(III) nitrate**

Toxicity to fish	flow-through test LC50 - <i>Oncorhynchus mykiss</i> (rainbow trout) - 24.1 mg/l - 96 h (OECD Test Guideline 203)
	static test LC50 - <i>Trout</i> - 20.1 mg/l - 96 h (OECD Test Guideline 203)
	Remarks: The value is given in analogy to the following substances: Chromium trinitrateThe value is given in analogy to the following substances: Chromium(III) nitrate
Toxicity to daphnia and other aquatic invertebrates	EC50 - <i>Daphnia magna</i> (Water flea) - 76.9 - 268.6 mg/l - 48 h Remarks: (ECHA)
Toxicity to fish(Chronic toxicity)	NOEC - Fish - 0.22 mg/l - 72 d (OECD Test Guideline 210)
Toxicity to daphnia and other aquatic invertebrates(Chronic toxicity)	NOEC - <i>Daphnia magna</i> (Water flea) - 0.303 - 0.886 mg/l - 21 d (US-EPA)
	NOEC - <i>Daphnia magna</i> (Water flea) - 0.303 - 0.886 mg/l - 21 d (US-EPA)

**nickel(II) nitrate**

Toxicity to bacteria	
Toxicity to fish(Chronic toxicity)	flow-through test NOEC - <i>Pimephales promelas</i> (fathead minnow) - 0.057 mg/l - 32 d Remarks: (ECHA)

**Cobalt(II) nitrate**

Toxicity to fish	semi-static test LC50 - <i>Pimephales promelas</i> (fathead minnow) - 1.866 mg/l - 96 h (US-EPA)
Toxicity to daphnia and other aquatic	static test LC50 - <i>Ceriodaphnia dubia</i> (water flea) - 0.39 mg/l - 48 h



invertebrates	(US-EPA)
Toxicity to algae	static test ErC50 - <i>Pseudokirchneriella subcapitata</i> - 0.095 mg/l - 72 h (OECD Test Guideline 201)
Toxicity to bacteria	static test EC50 - activated sludge - 120 mg/l - 30 min (OECD Test Guideline 209)
Toxicity to fish(Chronic toxicity)	semi-static test NOEC - <i>Pimephales promelas</i> (fathead minnow) - 0.9 mg/l - 7 d (US-EPA)
Toxicity to daphnia and other aquatic invertebrates(Chronic toxicity)	semi-static test NOEC - <i>Ceriodaphnia dubia</i> (water flea) - 0.02 mg/l - 7 d (US-EPA)

### **Copper(II) nitrate**

Toxicity to fish	flow-through test LC50 - <i>Pimephales promelas</i> (fathead minnow) - 0.19 mg/l - 96 h Remarks: (ECHA) The value is given in analogy to the following substances: Copper(II) nitrate trihydrate
Toxicity to daphnia and other aquatic invertebrates	static test - <i>Daphnia magna</i> (Water flea)

### **Zinc nitrate**

No data available

Toxicity to algae	IC50 - <i>Selenastrum capricornutum</i> (green algae) - 0.395 mg/l Remarks: (ECHA)
	NOEC - <i>Selenastrum capricornutum</i> (green algae) - 0.0552 mg/l Remarks: (ECHA)

### **Cadmium nitrate**

Toxicity to fish	LC50 - <i>Pimephales promelas</i> (fathead minnow) - 0.0132 mg/l - 96 h Remarks: (ECOTOX Database) (referred to the cation)
	flow-through test LC50 - <i>Ictalurus punctatus</i> - 4.48 mg/l - 96 h Remarks: (ECHA)
Toxicity to daphnia and other aquatic invertebrates	LC50 - <i>Daphnia magna</i> (Water flea) - 0.023 mg/l - 48 h Remarks: (referred to the cation) (ECOTOX Database)



Toxicity to fish(Chronic toxicity)	flow-through test NOEC - <i>Pimephales promelas</i> (fathead minnow) - 0.014 mg/l - 32 d Remarks: (referred to the cation) (ECOTOX Database)
<b>Lead(II) nitrate</b>	
Toxicity to fish	static test LC50 - <i>Oncorhynchus mykiss</i> (rainbow trout) - 0.1 mg/l - 96 h Remarks: (ECHA)
Toxicity to daphnia and other aquatic invertebrates	EC50 - <i>Daphnia magna</i> (Water flea) - 1.8 mg/l - 48 h Remarks: (ECOTOX Database)
Toxicity to algae	EC50 - algae - 0.024 - 0.029 mg/l - 28 h Remarks: (Lit.)
Toxicity to fish(Chronic toxicity)	semi-static test NOEC - <i>Pimephales promelas</i> (fathead minnow) - 1.337 mg/l - 7 d Remarks: (ECHA)
Toxicity to daphnia and other aquatic invertebrates(Chronic toxicity)	semi-static test NOEC - <i>Ceriodaphnia dubia</i> (water flea) - 0.0224 mg/l - 7 d (US-EPA)
<b>Silver nitrate</b>	
Toxicity to fish	semi-static test LC50 - <i>Pimephales promelas</i> (fathead minnow) - 0.0012 mg/l - 96 h (US-EPA)
Toxicity to daphnia and other aquatic invertebrates	semi-static test EC50 - <i>Daphnia magna</i> (Water flea) - 0.00022 mg/l - 48 h Remarks: (ECHA)
Toxicity to algae	static test ErC50 - <i>Raphidocelis subcapitata</i> (freshwater green alga) - 0.00252 mg/l - 72 h (OECD Test Guideline 201)
	static test EC10 - <i>Raphidocelis subcapitata</i> (freshwater green alga) - 0.00046 mg/l - 72 h (OECD Test Guideline 201)
Toxicity to fish(Chronic toxicity)	flow-through test NOEC - <i>Pimephales promelas</i> (fathead minnow) - 0.000351 mg/l - 34 d Remarks: (ECHA)
Toxicity to daphnia and other aquatic invertebrates(Chronic toxicity)	semi-static test EC10 - <i>Daphnia magna</i> (Water flea) - 0.0027 mg/l - 21 d Remarks: (ECHA)





REACH - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles (Annex XVII)	: nickel(II) nitrate
REACH - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles (Annex XVII)	: Cadmium nitrate
REACH - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles (Annex XVII)	: boric acid
REACH - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles (Annex XVII)	: Lead(II) nitrate
REACH - Candidate List of Substances of Very High Concern for Authorisation (Article 59).	: boric acid Cobalt(II) nitrate Cadmium nitrate Lead(II) nitrate
REACH - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles (Annex XVII)	: Cadmium nitrate Lead(II) nitrate
REACH - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles (Annex XVII)	: Lead(II) nitrate
Regulation (EU) 2019/1148 on the marketing and use of explosives precursors	: nitric acid

### National legislation

Seveso III: Directive 2012/18/EU of the European Parliament and of the Council on the control of major-accident hazards involving dangerous substances. E1

ENVIRONMENTAL HAZARDS

### Other regulations

Observe work restrictions regarding maternity protection in accordance to Dir 92/85/EEC or stricter national regulations where applicable.

Take note of Dir 94/33/EC on the protection of young people at work.

## 15.2 Chemical Safety Assessment

For this product a chemical safety assessment was not carried out

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## SECTION 16: Other information

### Full text of H-Statements

H272 May intensify fire; oxidizer.  
H290 May be corrosive to metals.



H300	Fatal if swallowed.
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.
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.
H351	Suspected of causing cancer.
H360D	May damage the unborn child.
H360Df	May damage the unborn child. Suspected of damaging fertility.
H360FD	May damage fertility. May damage the unborn child.
H361f	Suspected of damaging fertility.
H372	Causes damage to organs through prolonged or repeated exposure.
H373	May cause damage to organs through prolonged or repeated exposure if inhaled.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.
H411	Toxic to aquatic life with long lasting effects.
EUH071	Corrosive to the respiratory tract.



## Full text of other abbreviations

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

## Classification of the mixture

Met. Corr.1	H290
Skin Corr.1B	H314
Eye Dam.1	H318
Skin Sens.1	H317
Muta.1B	H340
Carc.1B	H350
Repr.1B	H360FD
STOT RE2	H373
Aquatic Acute1	H400
Aquatic Chronic2	H411

## Classification procedure:

Based on product data or assessment
Calculation method

## Further information

The information is believed to be correct but is not exhaustive and will be used solely as a guideline, which is based on current knowledge of the chemical substance or mixture



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