

**SAFETY DATA SHEET**

according to Regulation (EC) No. 1907/2006

Revision Date 09.01.2020

Version 1.9

**SECTION 1. Identification of the substance/mixture and of the company/undertaking****1.1 Product identifier**

Catalogue No.	109990
Product name	Silver nitrate solution for 1000 ml, $c(\text{AgNO}_3) = 0.1 \text{ mol/l}$ (0.1 N) Titrisol®
REACH Registration Number	This product is a mixture. REACH Registration Number see section 3.

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

Identified uses	Reagent for analysis For additional information on uses please refer to the Merck Chemicals portal ( <a href="http://www.merckgroup.com">www.merckgroup.com</a> ).
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**1.3 Details of the supplier of the safety data sheet**

Responsible Department	LS-QHC * e-mail: <a href="mailto:prodsafe@merckgroup.com">prodsafe@merckgroup.com</a>
Regional representation	Merck Chemicals Ltd * The Old Brickyard * New Road * Gillingham * Dorset * SP8 4XT * Tel. +44(0)1747 833000 * <a href="mailto:information@merckchem.co.uk">information@merckchem.co.uk</a> .

**1.4 Emergency telephone number** +49 (0) 6151 722440**SECTION 2. Hazards identification****2.1 Classification of the substance or mixture****Classification (REGULATION (EC) No 1272/2008)**

Corrosive to metals, Category 1, H290  
Skin corrosion, Category 1B, H314  
Short-term (acute) aquatic hazard, Category 1, H400  
Long-term (chronic) aquatic hazard, Category 1, H410

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

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Titrisol®

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## 2.2 Label elements

### Labelling (REGULATION (EC) No 1272/2008)

Hazard pictograms



Signal word

Danger

Hazard statements

H290 May be corrosive to metals.

H314 Causes severe skin burns and eye damage.

H410 Very toxic to aquatic life with long lasting effects.

Precautionary statements

Prevention

P273 Avoid release to the environment.

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

Response

P301 + P330 + P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes.

Remove contact lenses, if present and easy to do. Continue rinsing.

P308 + P310 IF exposed or concerned: immediately call a POISON CENTER or doctor/ physician.

### Reduced labelling ( $\leq 125 \text{ ml}$ )

Hazard pictograms



Signal word

Danger

Hazard statements

H314 Causes severe skin burns and eye damage.

Precautionary statements

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

P301 + P330 + P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P308 + P310 IF exposed or concerned: immediately call a POISON CENTER or doctor/ physician.

## 2.3 Other hazards

None known.

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## SECTION 3. Composition/information on ingredients

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The life science business of Merck operates as MilliporeSigma in the US and Canada

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Chemical nature Aqueous solution

### 3.1 Substance

Not applicable

### 3.2 Mixture

#### Hazardous components (REGULATION (EC) No 1272/2008)

*Chemical name (Concentration)*

CAS-No.	Registration number	Classification
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Silver nitrate (>= 25 % - < 50 % )

7761-88-8	01-2119513705-43-XXXX	
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Oxidizing solid, Category 2, H272  
Corrosive to metals, Category 1, H290  
Skin corrosion, Category 1B, H314  
Short-term (acute) aquatic hazard, Category 1, H400  
Long-term (chronic) aquatic hazard, Category 1, H410  
M-Factor: 1,000

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

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## SECTION 4. First aid measures

### 4.1 Description of first aid measures

*General advice*

First aider needs to protect himself.

After inhalation: fresh air. Call in physician.

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

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

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

Irritation and corrosion, Cough, Shortness of breath, Dizziness, Vomiting, Diarrhoea, gastric spasms, Unconsciousness, death

Risk of permanent damage due to staining of the cornea.

The following applies to soluble silver compounds: only slightly absorbed via the gastrointestinal tract. Strong irritations after contact with eyes and skin.

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

No information available.

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## SECTION 5. Firefighting measures

### 5.1 Extinguishing media

*Suitable extinguishing media*

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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

Not combustible.

Ambient fire may liberate hazardous vapours.

Fire may cause evolution of:  
nitrogen oxides

## 5.3 Advice for firefighters

*Special protective equipment 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.

*Further information*

Suppress (knock down) gases/vapours/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 vapours, aerosols. Avoid substance contact. Ensure adequate ventilation. Evacuate the danger area, observe emergency procedures, consult an expert.

Advice for emergency responders:

Protective equipment 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 with liquid-absorbent material (e.g. Chemisorb®). Dispose of properly.

Clean up affected area. Conduct recycling.

### 6.4 Reference to other sections

Indications about waste treatment see section 13.

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## SECTION 7. Handling and storage

### 7.1 Precautions for safe handling

*Advice on safe handling*

Observe label precautions.

*Hygiene measures*

Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.

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## 7.2 Conditions for safe storage, including any incompatibilities

*Requirements for storage areas and containers*

No aluminium, tin, or zinc containers.

No metal containers.

*Storage conditions*

Tightly closed. Protected from light.

Recommended storage temperature see product label.

## 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

#### Components with workplace control parameters

*Components*

Basis	Value	Threshold limits	Remarks
<i>Silver nitrate (7761-88-8)</i>			
EH40 WEL	Time Weighted Average (TWA):	0.01 mg/m <sup>3</sup>	Expressed as: as Ag
EU ELV	Time Weighted Average (TWA):	0.01 mg/m <sup>3</sup>	Indicative Expressed as: as Ag

#### Recommended monitoring procedures

Methods for measurement of the workplace atmosphere have to correspond to the requirements of norms DIN EN 482 and DIN EN 689.

### 8.2 Exposure controls

#### Engineering measures

Technical measures and appropriate working operations should be given priority over the use of personal protective equipment.

See section 7.1.

#### Individual protection measures

Protective clothing needs to be selected specifically for the workplace, depending on concentrations and quantities of the hazardous substances handled. The chemical resistance of the protective equipment should be enquired at the respective supplier.

*Eye/face protection*

Tightly fitting safety goggles

*Hand protection*

full contact:

Glove material: Nitrile rubber

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Glove thickness: 0.11 mm  
Break through time: 480 min

splash contact:

Glove material: Nitrile rubber  
Glove thickness: 0.11 mm  
Break through time: 480 min

The protective gloves to be used must comply with the specifications of EC Directive 89/686/EEC and the related standard EN374, for example KCL 741 Dermatril® L (full contact), KCL 741 Dermatril® L (splash contact).

The breakthrough times stated above were determined by KCL in laboratory tests acc. to EN374 with samples of the recommended glove types.

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 EN374 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: [www.kcl.de](http://www.kcl.de)).

*Other protective equipment*  
protective clothing

#### *Respiratory protection*

required when vapours/aerosols are generated.

Recommended Filter type: filter ABEK

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.

### **Environmental exposure controls**

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**

Form	liquid
Colour	colourless
Odour	odourless
Odour Threshold	No information available.
pH	ca. 7 - 9 at 20 °C
Melting point	No information available.
Boiling point	No information available.
Flash point	Not applicable

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Evaporation rate	No information available.
Flammability (solid, gas)	No information available.
Lower explosion limit	Not applicable
Upper explosion limit	Not applicable
Vapour pressure	No information available.
Relative vapour density	No information available.
Density	1.27 g/cm <sup>3</sup> at 20 °C
Relative density	No information available.
Water solubility	at 20 °C soluble
Partition coefficient: n-octanol/water	No information available.
Auto-ignition temperature	No information available.
Decomposition temperature	No information available.
Viscosity, dynamic	No information available.
Explosive properties	Not classified as explosive.
Oxidizing properties	none

## 9.2 Other data

Corrosion	May be corrosive to metals.
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## SECTION 10. Stability and reactivity

### 10.1 Reactivity

See section 10.3

### 10.2 Chemical stability

Sensitivity to light

### 10.3 Possibility of hazardous reactions

Violent reactions possible with:

The generally known reaction partners of water.

### 10.4 Conditions to avoid

no information available

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## 10.5 Incompatible materials

Aluminium  
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 oral toxicity*

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

##### *Acute inhalation toxicity*

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

##### *Acute dermal toxicity*

This information is not available.

##### *Skin irritation*

Mixture causes burns.

##### *Eye irritation*

Mixture causes serious eye damage. Risk of blindness!

##### *Sensitisation*

This information is not available.

##### *Germ cell mutagenicity*

This information is not available.

##### *Carcinogenicity*

This information is not available.

##### *Reproductive toxicity*

This information is not available.

##### *Teratogenicity*

This information is not available.

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

This information is not available.

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

This information is not available.

##### *Aspiration hazard*

This information is not available.

### 11.2 Further information

Property that must be anticipated on the basis from the components of the mixture:

After uptake of large quantities:



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Vomiting, gastric spasms, Diarrhoea, Dizziness, Unconsciousness, death  
The following applies to soluble silver compounds: only slightly absorbed via the gastrointestinal tract. Strong irritations after contact with eyes and skin.  
Other dangerous properties can not be excluded.  
Handle in accordance with good industrial hygiene and safety practice.

## Components

### *Silver nitrate*

#### *Skin irritation*

In vitro study

Result: Corrosive

OECD Test Guideline 431

#### *Eye irritation*

Rabbit

Result: Causes burns.

(External MSDS)

#### *Germ cell mutagenicity*

*Genotoxicity in vitro*

Ames test

Salmonella typhimurium

Result: negative

(External MSDS)

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## SECTION 12. Ecological information

### Mixture

#### 12.1 Toxicity

No information available.

#### 12.2 Persistence and degradability

No information available.

#### 12.3 Bioaccumulative potential

No information available.

#### 12.4 Mobility in soil

No information available.

#### 12.5 Results of PBT and vPvB assessment

Substance(s) in the mixture do(es) not meet the criteria for PBT or vPvB according to Regulation (EC) No 1907/2006, Annex XIII, or a PBT/vPvB assessment was not conducted.

#### 12.6 Other adverse effects

Discharge into the environment must be avoided.

## Components

### *Silver nitrate*

#### *Toxicity to fish*

semi-static test LC50 Pimephales promelas (fathead minnow): 0.0012 mg/l; 96 h

Analytical monitoring: yes

(ECHA)

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*Toxicity to daphnia and other aquatic invertebrates*  
semi-static test LC50 Daphnia magna (Water flea): 0.00022 mg/l; 48 h  
Analytical monitoring: yes  
(ECHA)

*Toxicity to bacteria*  
EC10 Pseudomonas putida: 0.006 mg/l; 16 h  
(External MSDS)

*Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)*  
semi-static test NOEC Daphnia magna (Water flea): 0.00032 mg/l; 21 d

Analytical monitoring: yes

US-EPA

#### *Biodegradability*

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

*M-Factor*  
1,000

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## SECTION 13. Disposal considerations

### *Waste treatment methods*

Waste material must be disposed of in accordance with the national and local regulations. Leave chemicals in original containers. No mixing with other waste. Handle uncleaned containers like the product itself.

See [www.retrologistik.com](http://www.retrologistik.com) for processes regarding the return of chemicals and containers, or contact us there if you have further questions.

Notice Directive on waste 2008/98/EC.

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## SECTION 14. Transport information

### Land transport (ADR/RID)

<b>14.1 UN number</b>	UN 1760
<b>14.2 Proper shipping name</b>	CORROSIVE LIQUID, N.O.S. (SILVER NITRATE SOLUTION)
<b>14.3 Class</b>	8
<b>14.4 Packing group</b>	II
<b>14.5 Environmentally hazardous</b>	yes
<b>14.6 Special precautions for user</b>	yes
Tunnel restriction code	E

### Inland waterway transport (ADN)

Not relevant

### Air transport (IATA)

<b>14.1 UN number</b>	UN 1760
<b>14.2 Proper shipping name</b>	CORROSIVE LIQUID, N.O.S. (SILVER NITRATE SOLUTION)
<b>14.3 Class</b>	8
<b>14.4 Packing group</b>	II
<b>14.5 Environmentally hazardous</b>	yes
<b>14.6 Special precautions for user</b>	no

### Sea transport (IMDG)

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**14.1 UN number** UN 1760  
**14.2 Proper shipping name** CORROSIVE LIQUID, N.O.S. (SILVER NITRATE SOLUTION)  
**14.3 Class** 8  
**14.4 Packing group** II  
**14.5 Environmentally hazardous** yes  
**14.6 Special precautions for user** yes  
EmS F-A S-B  
**14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code**  
Not relevant

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## SECTION 15. Regulatory information

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

#### *EU regulations*

Major Accident Hazard Legislation SEVESO III ENVIRONMENTAL HAZARDS E1  
Quantity 1: 100 t  
Quantity 2: 200 t

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

Regulation (EC) No 1005/2009 on substances that deplete the ozone layer not regulated

Regulation (EC) No 850/2004 of the European Parliament and of the Council of 29 April 2004 on persistent organic pollutants and amending Directive 79/117/EEC not regulated

Substances of very high concern (SVHC) This product does not contain substances of very high concern according to Regulation (EC) No 1907/2006 (REACH), Article 57 above the respective regulatory concentration limit of  $\geq 0.1 \%$  (w/w).

#### *National legislation*

Storage class 8B

### 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 referred to under sections 2 and 3.

H272 May intensify fire; oxidizer.  
H290 May be corrosive to metals.  
H314 Causes severe skin burns and eye damage.  
H400 Very toxic to aquatic life.  
H410 Very toxic to aquatic life with long lasting effects.

### Training advice

Provide adequate information, instruction and training for operators.

### Labelling

Hazard pictograms



### Signal word

Danger

### Hazard statements

H290 May be corrosive to metals.  
H314 Causes severe skin burns and eye damage.  
H410 Very toxic to aquatic life with long lasting effects.

### Precautionary statements

Prevention

P273 Avoid release to the environment.  
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response

P301 + P330 + P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.  
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes.  
Remove contact lenses, if present and easy to do. Continue rinsing.  
P308 + P310 IF exposed or concerned: immediately call a POISON CENTER or doctor/physician.

### Relevant changes since previous version

3. Composition/information on ingredients

### Key or legend to abbreviations and acronyms used in the safety data sheet

Used abbreviations and acronyms can be looked up at [www.wikipedia.org](http://www.wikipedia.org).

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*The information contained herein is based on the present state of our knowledge. It characterises the product with regard to the appropriate safety precautions. It does not represent a guarantee of any properties of the product.*

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