

### Safety data sheet according to U.S.A. Federal Hazcom 2012 and Canadian Regulation SOR/88-66

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

##### 1.1. Product identifier.

Code. **HI8071**  
Product name. **3.5M KCl with AgCl Reference Electrolyte**

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

Intended use. **Reference Electrolyte Solution for pH and ORP Electrodes.**

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

Name. **Hanna Instruments S.R.L.**  
Full address. **str. Hanna Nr 1**  
District and Country. **457260 loc. Nusfalau (Salaj) Romania**  
Tel. **(+40) 260607700**  
Fax. **(+40) 260607700**

e-mail address of the competent person responsible for the Safety Data Sheet. **sds@hannainst.com**

Product distribution by: **Hanna Instruments, Inc - 584 Park East, Woonsochet, Rhode Island, USA 02895 - Technical Service Contact Information: +1-800-426-6287**

##### 1.4. Emergency telephone number.

For urgent inquiries refer to. **USA Emergency Contact Information: +1-800-424-9300 - CHEMTREC 24 hours/365 days - International Emergency Contact Information: +1-703-527-3887 - CHEMTREC 24hours/365 days**

#### SECTION 2. Hazards identification.

##### 2.1. Classification of the substance or mixture.

The product is not classified as hazardous pursuant to the provisions set forth in OSHA Hazard Communication Standard (HCS) (29 CFR 1910.1200). However, since the product contains hazardous substances in concentrations such as to be declared in section no. 3, it requires a safety data sheet with appropriate information.

Hazard pictograms: --  
Signal words: Warning

Hazard statements: --

Precautionary statements:

Prevention: **P273** Avoid release to the environment.

Response: **P391** Collect spillage.

Storage: --

Disposal: --

##### 2.2. Other hazards.

Environmental classification as for Reg. (EU) 1272/2008 (CLP):

The product is classified as hazardous for environment pursuant to the provisions set forth in EC Regulation 1272/2008 (CLP).

Classification and Hazard Statement.

Hazardous to the aquatic environment, acute toxicity, category 1

Very toxic to aquatic life.

Hazardous to the aquatic environment, chronic toxicity, category 2

Toxic to aquatic life with long lasting effects.

### SECTION 2. Hazards identification. ... / >>

Hazard pictograms:



Signal words: Warning

Hazard statements: --  
**H400** Very toxic to aquatic life.  
**H411** Toxic to aquatic life with long lasting effects.

Precautionary statements:

Prevention: --  
 Response: --  
 Storage: --  
 Disposal: --

Additional hazards.  
Information not available.

### SECTION 3. Composition/information on ingredients.

#### 3.1. Substances.

Information not relevant.

#### 3.2. Mixtures.

Contains:

Identification.	x = Conc. %.	Classification:
<b>SILVER NITRATE</b>		
CAS. 7761-88-8	$0.025 \leq x < 0.25$	Oxidising solid, category 2 H272, Substance or mixture corrosive to metals, category 1 H290, Skin corrosion, category 1B H314, Hazardous to the aquatic environment, acute toxicity, category 1 H400 M=1000, Hazardous to the aquatic environment, chronic toxicity, category 1 H410 M=100
EC. 231-853-9 INDEX.		

\* There is a batch to batch variation.

The full wording of hazard (H) phrases is given in section 16 of the sheet.

### SECTION 4. First aid measures.

#### 4.1. Description of first aid measures.

Not specifically necessary. Observance of good industrial hygiene is recommended.

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

No episodes of damage to health ascribable to the product have been reported.

SILVER NITRATE

Irritation and corrosion, Cough, Shortness of breath, Dizziness, Unconsciousness, Diarrhoea, gastric spasms, Vomiting, death, Risk of permanent damage due to staining of the cornea. Risk of blindness! 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.

Information not available.

## SECTION 5. Firefighting measures.

### 5.1. Extinguishing media.

#### SUITABLE EXTINGUISHING EQUIPMENT

Extinguishing substances are: carbon dioxide and chemical powder. For product loss or leakage that has not caught fire, water spray can be used to disperse flammable vapours and protect those trying to stem the leak.

#### UNSUITABLE EXTINGUISHING EQUIPMENT

Do not use jets of water.

Water is not effective for putting out fires but can be used to cool containers exposed to flames to prevent explosions.

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

#### HAZARDS CAUSED BY EXPOSURE IN THE EVENT OF FIRE

If large quantities of the product are involved in a fire, they can make it considerably worse. Do not breathe combustion products.

#### SILVER NITRATE

Not combustible. Has a fire-promoting effect due to release of oxygen. Ambient fire may liberate hazardous vapours. Fire may cause evolution of: nitrogen oxides.

### 5.3. Advice for firefighters.

#### GENERAL INFORMATION

In the case of fire, use jets of water to cool the containers to prevent the risk of explosions (product decomposition and excess pressure) and the development of substances potentially hazardous for health. Always wear full fire prevention gear. Remove all containers containing the product from the fire, if it is safe to do so.

#### SPECIAL PROTECTIVE EQUIPMENT FOR FIRE-FIGHTERS

Normal fire fighting clothing i.e. fire kit (BS EN 469), gloves (BS EN 659) and boots (HO specification A29 and A30) in combination with self-contained open circuit positive pressure compressed air breathing apparatus (BS EN 137).

## SECTION 6. Accidental release measures.

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

Block the leakage if there is no hazard.

Wear suitable protective equipment (including personal protective equipment referred to under Section 8 of the safety data sheet) to prevent any contamination of skin, eyes and personal clothing. These indications apply for both processing staff and those involved in emergency procedures.

### 6.2. Environmental precautions.

The product must not penetrate into the sewer system or come into contact with surface water or ground water.

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

Collect the leaked product into a suitable container. If the product is flammable, use explosion-proof equipment. Evaluate the compatibility of the container to be used, by checking section 10. Absorb the remainder with inert absorbent material.

Make sure the leakage site is well aired. Contaminated material should be disposed of in compliance with the provisions set forth in point 13.

### 6.4. Reference to other sections.

Any information on personal protection and disposal is given in sections 8 and 13.

## SECTION 7. Handling and storage.

### 7.1. Precautions for safe handling.

Before handling the product, consult all the other sections of this material safety data sheet. Avoid leakage of the product into the environment. Do not eat, drink or smoke during use.

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

Keep the product in clearly labelled containers. Keep containers away from any incompatible materials, see section 10 for details.

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

Information not available.

## SECTION 8. Exposure controls/personal protection.

### 8.1. Control parameters.

Regulatory References:

EU OEL EU Directive 2009/161/EU; Directive 2006/15/EC; Directive 2004/37/EC; Directive 2000/39/EC.  
TLV-ACGIH ACGIH 2016

#### SILVER NITRATE

##### Threshold Limit Value.

Type	Country	TWA/8h		STEL/15min	
		mg/m <sup>3</sup>	ppm	mg/m <sup>3</sup>	ppm
OEL	EU	0.01			
TLV-ACGIH	-	0.01			

Legend:

(C) = CEILING ; INHAL = Inhalable Fraction ; RESP = Respirable Fraction ; THORA = Thoracic Fraction.

### 8.2. Exposure controls.

As the use of adequate technical equipment must always take priority over personal protective equipment, make sure that the workplace is well aired through effective local aspiration.

#### HAND PROTECTION

Protect hands with category III work gloves (OSHA 29 CFR 1910.138).

The following should be considered when choosing work glove material: compatibility, degradation, failure time and permeability.

The work gloves' resistance to chemical agents should be checked before use, as it can be unpredictable. The gloves' wear time depends on the duration and type of use.

#### SKIN PROTECTION

Wear category I professional long-sleeved overalls and safety footwear (see Directive 89/686/EEC and standard EN ISO 20344). Wash body with soap and water after removing protective clothing.

#### EYE PROTECTION

Wear airtight protective goggles (OSHA 29 CFR 1910.133).

#### RESPIRATORY PROTECTION

If the threshold value (e.g. TLV-TWA) is exceeded for the substance or one of the substances present in the product, wear a mask with a NIOSH certified filter, whose class must be chosen according to the limit of use concentration (NIOSH 42 CFR 84, OSHA 29 CFR 1910.134). In the presence of gases or vapours of various kinds and/or gases or vapours containing particulate (aerosol sprays, fumes, mists, etc.) combined filters are required.

Respiratory protection devices must be used if the technical measures adopted are not suitable for restricting the worker's exposure to the threshold values considered. The protection provided by masks is in any case limited.

If the substance considered is odourless or its olfactory threshold is higher than the corresponding TLV-TWA and in the case of an emergency, wear open-circuit compressed air breathing apparatus or external air-intake breathing apparatus. For a correct choice of respiratory protection device, see standard NIOSH 42 CFR 84 and OSHA 29 CFR 1910.134.

#### ENVIRONMENTAL EXPOSURE CONTROLS.

The emissions generated by manufacturing processes, including those generated by ventilation equipment, should be checked to ensure compliance with environmental standards.

Product residues must not be indiscriminately disposed of with waste water or by dumping in waterways.

## SECTION 9. Physical and chemical properties.

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

Appearance	liquid
Colour	colourless
Odour	odourless
Odour threshold.	Not available.
pH.	6.3
Melting point / freezing point.	Not available.
Initial boiling point.	Not available.
Boiling range.	Not available.
Flash point.	> 93 °C. (199,4 °F)
Evaporation rate	Not available.
Flammability (solid, gas)	Not available.
Lower inflammability limit.	Not available.
Upper inflammability limit.	Not available.
Lower explosive limit.	Not available.

### SECTION 9. Physical and chemical properties. ... / >>

Upper explosive limit.	Not available.
Vapour pressure.	Not available.
Vapour density	Not available.
Relative density.	1.500
Solubility	soluble in water
Partition coefficient: n-octanol/water	Not available.
Auto-ignition temperature.	Not available.
Decomposition temperature.	Not available.
Viscosity	Not available.
Explosive properties	Not available.
Oxidising properties	Not available.

#### 9.2. Other information.

Total solids (250°C / 482°F)	22,63 %
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### SECTION 10. Stability and reactivity.

#### 10.1. Reactivity.

There are no particular risks of reaction with other substances in normal conditions of use.

SILVER NITRATE

Has a corrosive effect.

#### 10.2. Chemical stability.

The product is stable in normal conditions of use and storage.

SILVER NITRATE

Sensitivity to light.

#### 10.3. Possibility of hazardous reactions.

No hazardous reactions are foreseeable in normal conditions of use and storage.

SILVER NITRATE

Exothermic reaction with: Risk of ignition or formation of inflammable gases or vapours with: Alcohols, arsenic, halogen-halogen compounds, nonmetals, organic nitro compounds, Sodium hydroxide, magnesium, acetylidene, hydrazine and derivatives, carbides, azides, ammonium hydroxide, ethanol, Ammonia, Nitriles, Acetylene, Aldehydes, oxidisable substances, combustible substances.

#### 10.4. Conditions to avoid.

None in particular. However the usual precautions used for chemical products should be respected.

SILVER NITRATE

Strong heating (decomposition). Exposure to light.

#### 10.5. Incompatible materials.

SILVER NITRATE

Aluminium, Mild steel.

#### 10.6. Hazardous decomposition products.

Information not available.

### SECTION 11. Toxicological information.

#### 11.1. Information on toxicological effects.

SILVER NITRATE

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. - Skin irritation, In vitro study, Result: Corrosive, Causes burns - Eye irritation rabbit, Result: Causes burns, Causes serious eye damage.

Risk of permanent damage due to staining of the cornea. Risk of blindness!

ACUTE TOXICITY.

LC50 (Inhalation - vapours) of the mixture: Not classified (no significant component).

### SECTION 11. Toxicological information. ... / >>

LC50 (Inhalation - mists / powders) of the mixture: Not classified (no significant component).  
LD50 (Oral) of the mixture: Not classified (no significant component).  
LD50 (Dermal) of the mixture: Not classified (no significant component).

SILVER NITRATE  
LD50 (Oral). 1173 mg/kg Rat

SKIN CORROSION / IRRITATION.  
Does not meet the classification criteria for this hazard class.

SERIOUS EYE DAMAGE / IRRITATION.  
Does not meet the classification criteria for this hazard class.

RESPIRATORY OR SKIN SENSITISATION.  
Does not meet the classification criteria for this hazard class.

GERM CELL MUTAGENICITY.  
Does not meet the classification criteria for this hazard class.

CARCINOGENICITY.  
Does not meet the classification criteria for this hazard class.

REPRODUCTIVE TOXICITY.  
Does not meet the classification criteria for this hazard class.

STOT - SINGLE EXPOSURE.  
Does not meet the classification criteria for this hazard class.

STOT - REPEATED EXPOSURE.  
Does not meet the classification criteria for this hazard class.

ASPIRATION HAZARD.  
Does not meet the classification criteria for this hazard class.

### SECTION 12. Ecological information.

This product is dangerous for the environment and highly toxic for aquatic organisms.  
This product is dangerous for the environment and is toxic for aquatic organisms. In the long term, it have negative effects on acquatic environment.

#### 12.1. Toxicity.

SILVER NITRATE  
LC50 - for Fish. 0.0067 mg/l/96h Pimephales promelas  
EC50 - for Crustacea. 0.0006 mg/l/48h Daphnia magna  
Chronic NOEC for Fish. 0.011 mg/l Leuciscus idus

#### 12.2. Persistence and degradability.

Information not available.

#### 12.3. Bioaccumulative potential.

SILVER NITRATE  
Partition coefficient: n-octanol/water. 5 Log Kow

#### 12.4. Mobility in soil.

Information not available.

#### 12.5. Results of PBT and vPvB assessment.

On the basis of available data, the product does not contain any PBT or vPvB in percentage greater than 0,1%.

#### 12.6. Other adverse effects.

SILVER NITRATE  
Forms corrosive mixtures with water even if diluted. Discharge into the environment must be avoided.

### SECTION 13. Disposal considerations.

#### 13.1. Waste treatment methods.

Reuse, when possible. Neat product residues should be considered special non-hazardous waste.  
Disposal must be performed through an authorised waste management firm, in compliance with national and local regulations.  
Waste transportation may be subject to dangerous goods transport regulations.  
CONTAMINATED PACKAGING  
Contaminated packaging must be recovered or disposed of in compliance with national waste management regulations.

### SECTION 14. Transport information.

#### 14.1. UN number.

ADR / RID, IMDG, IATA: 3082

ADR / RID: In accordance with Special Provision 375, this product, when is packed in receptacles of a capacity ≤ 5Kg or 5L, is not submitted to ADR provisions.

IMDG: In accordance with Section 2.10.2.7 of IMDG Code, this product, when is packed in receptacles of a capacity ≤ 5Kg or 5L, is not submitted to IMDG Code provisions.

IATA: In accordance with SP A197, this product, when is packed in receptacles of a capacity ≤ 5Kg or 5L, is not submitted to IATA dangerous goods regulations.

#### 14.2. UN proper shipping name.

ADR / RID: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (SILVER NITRATE MIXTURE)

IMDG: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (SILVER NITRATE MIXTURE)

IATA: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (SILVER NITRATE MIXTURE)

#### 14.3. Transport hazard class(es).

ADR / RID: Class: 9 Label: 9



IMDG: Class: 9 Label: 9



IATA: Class: 9 Label: 9



#### 14.4. Packing group.

ADR / RID, IMDG, IATA: III

### SECTION 14. Transport information. ... / >>

#### 14.5. Environmental hazards.

ADR / RID: Environmentally Hazardous.



IMDG: Marine Pollutant.



IATA: Environmentally Hazardous.



#### 14.6. Special precautions for user.

ADR / RID:	HIN - Kemler: 90 Special Provision: -	Limited Quantities: 5 L	Tunnel restriction code: (E)
IMDG:	EMS: F-A, S-F	Limited Quantities: 5 L	
IATA:	Cargo: Pass.:	Maximum quantity: 450 L Maximum quantity: 450 L	Packaging instructions: 964 Packaging instructions: 964
	Special Instructions:	A97, A158, A197	

#### 14.7. Transport in bulk according to Annex II of Marpol and the IBC Code.

Information not relevant.

### SECTION 15. Regulatory information.

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

U.S. Federal Regulations.

TSCA:

All components are listed on TSCA Inventory.

Clean Air Act Section 112(b):

No component(s) listed.

Clean Air Act Section 602 Class I Substances:

No component(s) listed.

Clean Air Act Section 602 Class II Substances:

No component(s) listed.

Clean Water Act – Priority Pollutants:

No component(s) listed.

Clean Water Act – Toxic Pollutants:

No component(s) listed.

DEA List I Chemicals (Precursor Chemicals):

No component(s) listed.

DEA List II Chemicals (Essential Chemicals):

No component(s) listed.

EPA List of Lists:

313 Category Code:

7761-88-8 SILVER NITRATE

EPCRA 302 EHS TPQ:

No component(s) listed.

EPCRA 304 EHS RQ:



### SECTION 15. Regulatory information. ... / >>

No component(s) listed.

CERCLA RQ:  
7761-88-8 SILVER NITRATE

EPCRA 313 TRI:  
7761-88-8 SILVER NITRATE

RCRA Code:  
No component(s) listed.

CAA 112 (r) RMP TQ:  
No component(s) listed.

#### State Regulations.

Massachusetts:  
No component(s) listed.

Minnesota:  
No component(s) listed.

New Jersey:  
No component(s) listed.

New York:  
No component(s) listed.

Pennsylvania:  
No component(s) listed.

California:  
No component(s) listed.

Proposition 65:  
This product does not contain any substances know to the State of California to cause cancer, reproductive harm or birth defects.

International Regulations.  
Substances subject to exportation reporting pursuant to (EC) Reg. 649/2012:  
None.

Substances subject to the Rotterdam Convention:  
None.

Substances subject to the Stockholm Convention:  
None.

Candadian WHMIS.  
Information not available.

### SECTION 16. Other information.

Text of hazard (H) indications mentioned in section 2-3 of the sheet:

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

#### LEGEND:

- 313 CATEGORY CODE: Emergency Planning and Community Right-to Know Act Section 313 Category Code
- ADR: European Agreement concerning the carriage of Dangerous goods by Road
- CAA 112 @ RMP TQ: Risk Management Plan Threshold Quantity (Clean Air Act Section 112@)
- CAS NUMBER: Chemical Abstract Service Number
- CE50: Effective concentration (required to induce a 50% effect)
- CERCLA RQ: Reportable Quantity (Comprehensive Environment Response, Compensation, and Liability Act)

### SECTION 16. Other information. ... / >>

- CLP: EC Regulation 1272/2008
- DEA: Drug Enforcement Administration
- EmS: Emergency Schedule
- EPA: US Environmental Protection Agency
- EPCRA: Emergency Planning and Community Right-to Know Act
- EPCRA 302 EHS TPQ: Extremely Hazardous Substance Threshold Planning Quantity (Section 302 Category Code)
- EPCRA 304 EHS RQ: Extremely Hazardous Substance Reportable Quantity (Section 304 Category Code)
- EPCRA 313 TRI: Toxics Release Inventory (Section 313 Category Code)
- GHS: Globally Harmonized System of classification and labeling of chemicals
- IATA DGR: International Air Transport Association Dangerous Goods Regulation
- IC50: Immobilization Concentration 50%
- IMDG: International Maritime Code for dangerous goods
- IMO: International Maritime Organization
- LC50: Lethal Concentration 50%
- LD50: Lethal dose 50%
- OEL: Occupational Exposure Level
- PEL: Predicted exposure level
- RCRA Code: Resource Conservation and Recovery Act Code
- REL: Recommended exposure limit
- RID: Regulation concerning the international transport of dangerous goods by train
- TLV: Threshold Limit Value
- TLV CEILING: Concentration that should not be exceeded during any time of occupational exposure.
- TSCA: Toxic Substances Control Act
- TWA STEL: Short-term exposure limit
- TWA: Time-weighted average exposure limit
- VOC: Volatile organic Compounds
- WHMIS: Workplace Hazardous Materials Information System.

#### GENERAL BIBLIOGRAPHY:

- GHS rev. 3
- The Merck Index. 10th Edition
- Handling Chemical Safety
- Niosh - Registry of Toxic Effects of Chemical Substances
- INRS - Fiche Toxicologique (toxicological sheet)
- Patty - Industrial Hygiene and Toxicology
- N.I. Sax - Dangerous properties of Industrial Materials-7, 1989 Edition
- ECHA website
  
- 6 NYCRR part 597
- Cal/OSHA website
- California Safe Drinking Water and Toxic Enforcement Act
- EPA website
- Hazard Communication Standard (HCS 2012)
- IARC website
- List Of Lists EPA: Consolidated List of Chemicals Subject to EPCRA, CERCLA and Section 112® of the Clean Air Act
- Massachusetts 105 CMR Department of public health 670.000: "Right to Know"
- Minnesota Chapter 5206 Department Of Labor and Industry Hazardous Substances, Employee "Right to Know".
- New Jersey Worker and Community Right to know Act N.J.S.A.
- NTP. 2011. Report on Carcinogens, 12th Edition.
- OSHA website
- Pennsylvania, Hazardous Substance List, Chapter 323

#### Note for users:

The information contained in the present sheet are based on our own knowledge on the date of the last version. Users must verify the suitability and thoroughness of provided information according to each specific use of the product.

This document must not be regarded as a guarantee on any specific product property.

The use of this product is not subject to our direct control; therefore, users must, under their own responsibility, comply with the current health and safety laws and regulations. The producer is relieved from any liability arising from improper uses.

Provide appointed staff with adequate training on how to use chemical products.

#### Changes to previous review:

The following sections were modified:

**SECTION 16. Other information.** ... / >>

01 / 02 / 03 / 04 / 05 / 06 / 08 / 09 / 10 / 11 / 12 / 14 / 15.