



ID Card

Silver nitrate

Version 5 August 2013

Notes:

- This ID card is used to support the substance sameness discussions in SIEFs and to describe the substance to the best of the SIEF members' knowledge.
- It also aims at grouping communications relevant to the request of available data or information, the approval of the proposed Lead Registrant and the registration strategy with the SIEF.
- It is the responsibility of each individual registrant to identify their substance and to report company-specific identity in their Registration Dossier (section 1 of IUCLID).

DISCLAIMER

All data and information contained in this document shall be treated by the receiving party (i) in full confidence with the adequate respect of any confidential and/or proprietary nature of such information and (ii) only in the framework of the purpose of agreeing on substance sameness, Lead Registrant and overall REACH Strategy for the concerned Substance under REACH (the 'Purpose').

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1. Identification of the substance

Table 1. Identification of the substance

	Original (in EC inventory)
Name	Silver nitrate
EC number	231-853-9
CAS number	7761-88-8
Description	Not available
Composition type	Mono-constituent substance

2. Synonyms and other identifiers of the substance

Table 2. Synonyms and other identifiers of the substance

IUPAC name	Silver(1+) nitrate
CAS name	Silver nitrate
Abbreviations	None
Other commercial, brand or international names	Nitric acid silver(1+) salt Silver mononitrate



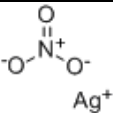
	Silver(I) nitrate
Other identity codes	None

3. Substances (with core identifiers) also falling under this substance (with justification)

None

4. Information related to molecular and structural formula of the substance

Table 3. Information related to molecular and structural formula of the substance

Molecular formula	AgNO ₃
Structural formula	
Smiles notation	[N+](=O)([O-])[O-].[Ag+]
Optical activity	
Typical ratio of (stereo) isomers	Not applicable
Molecular Weight / Molecular Weight range	169,87 g/mol

5. Typical composition of the substance

Silver nitrate is marketed in the form of crystals (varying particle sizes which may influence the extent of oxidising properties) or aqueous solutions (varying concentrations which may influence the skin corrosivity and/or eye damage potential). All forms will be addressed in the same Registration Dossier but are reported individually in IUCLID section 1.2 and linked to the appropriate classification.

5.1 Silver nitrate - Solid, D10 < 250 µm – Ox. Sol. Cat. 1

Table 4. Typical composition

	Name	Symbol / Formula	Typical concentration (range) (%)
Main constituent(s)*	Silver nitrate	AgNO ₃	≥ 99,0
Impurity(ies)#	Chlorides	Cl	< 1
	Sulphates	SO ₄	< 1
	Copper	Cu	< 1
	Iron	Fe	< 1



	Lead	Pb	< 1
	Other	N/A	< 1

* $\geq 80\%$ (w/w) for mono-constituent substances; $\geq 10\%$ (w/w) and $< 80\%$ (w/w) for multi-constituent substances.

An impurity is an unintended constituent present in a substance, as produced. It may originate from the starting materials or be the result of secondary or incomplete reactions during the production process. While impurities are present in the final substance, they were not intentionally added.

The composition given above is typical and should therefore represent the majority of Silver nitrate - Solid, D10 < 250 μm as manufactured and/or imported in the EEA market. Silver nitrate - Solid, D10 < 250 μm containing less than 99 % Silver nitrate may still be considered to be the same for the purpose of registration under REACH and may be referred to as impure Silver nitrate - Solid, D10 < 250 μm to distinguish it from the typically pure Silver nitrate - Solid, D10 < 250 μm .

5.2 Silver nitrate – Solid, D10 > 250 μm – Ox. Sol. Cat. 2

Table 5. Typical composition

	Name	Symbol / Formula	Typical concentration (range) (%)
Main constituent(s)*	Silver nitrate	AgNO ₃	$\geq 99,0$
Impurity(ies)#	Chlorides	Cl	< 1
	Sulphates	SO ₄	< 1
	Copper	Cu	< 1
	Iron	Fe	< 1
	Lead	Pb	< 1
	Other	N/A	< 1

* $\geq 80\%$ (w/w) for mono-constituent substances; $\geq 10\%$ (w/w) and $< 80\%$ (w/w) for multi-constituent substances.

An impurity is an unintended constituent present in a substance, as produced. It may originate from the starting materials or be the result of secondary or incomplete reactions during the production process. While impurities are present in the final substance, they were not intentionally added.

The composition given above is typical and should therefore represent the majority of Silver nitrate – Solid, D10 > 250 μm as manufactured and/or imported in the EEA market. Silver nitrate – Solid, D10 > 250 μm containing less than 99 % Silver nitrate may still be considered to be the same for the purpose of registration under REACH and may be referred to as impure Silver nitrate – Solid, D10 > 250 μm to distinguish it from the typically pure Silver nitrate – Solid, D10 > 250 μm .

5.3 Silver nitrate – Aqueous solution $\geq 5\%$ AgNO₃ – No ox. prop. but skin corr. Cat. 1B + Eye dam. Cat. 1

Table 6. Typical composition

	Name	Symbol / Formula	Typical concentration (range) (%)
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Main constituent(s)*	Silver nitrate	AgNO ₃	≥ 5,0
	Water	H ₂ O	< 95,0
Impurity(ies)#	Chlorides	Cl	< 1
	Sulphates	SO ₄	< 1
	Copper	Cu	< 1
	Iron	Fe	< 1
	Lead	Pb	< 1
	Other	N/A	< 1

* ≥ 80 % (w/w) for mono-constituent substances; ≥ 10 % (w/w) and < 80 % (w/w) for multi-constituent substances.

An impurity is an unintended constituent present in a substance, as produced. It may originate from the starting materials or be the result of secondary or incomplete reactions during the production process. While impurities are present in the final substance, they were not intentionally added.

The composition given above is typical and should therefore represent the majority of Silver nitrate - Aqueous solution ≥ 5% AgNO₃ as manufactured and/or imported in the EEA market.

5.4 Silver nitrate – Aqueous solution ≥ 3 - < 5% AgNO₃ – No ox. prop. but skin irr. Cat. 2 + Eye dam. Cat. 1

Table 7. Typical composition

	Name	Symbol / Formula	Typical concentration (range) (%)
Main constituent(s)*	Silver nitrate	AgNO ₃	≥ 3,0 - < 5,0
	Water	H ₂ O	≥ 95,0
Impurity(ies)#	Chlorides	Cl	< 1
	Sulphates	SO ₄	< 1
	Copper	Cu	< 1
	Iron	Fe	< 1
	Lead	Pb	< 1
	Other	N/A	< 1

* ≥ 80 % (w/w) for mono-constituent substances; ≥ 10 % (w/w) and < 80 % (w/w) for multi-constituent substances.

An impurity is an unintended constituent present in a substance, as produced. It may originate from the starting materials or be the result of secondary or incomplete reactions during the production process. While impurities are present in the final substance, they were not intentionally added.

The composition given above is typical and should therefore represent the majority of Silver nitrate - Aqueous solution ≥ 3 - < 5% AgNO₃ as manufactured and/or imported in the EEA market.

5.5 Silver nitrate – Aqueous solution < 3% AgNO₃ – No ox. prop. but skin irr. Cat. 2 + Eye irr. Cat. 2



Table 8. Typical composition

	Name	Symbol / Formula	Typical concentration (range) (%)
Main constituent(s)*	Silver nitrate	AgNO ₃	< 3,0
	Water	H ₂ O	≥ 97,0
Impurity(ies)#	Chlorides	Cl	< 1
	Sulphates	SO ₄	< 1
	Copper	Cu	< 1
	Iron	Fe	< 1
	Lead	Pb	< 1
	Other	N/A	< 1

* ≥ 80 % (w/w) for mono-constituent substances; ≥ 10 % (w/w) and < 80 % (w/w) for multi-constituent substances.

An impurity is an unintended constituent present in a substance, as produced. It may originate from the starting materials or be the result of secondary or incomplete reactions during the production process. While impurities are present in the final substance, they were not intentionally added.

The composition given above is typical and should therefore represent the majority of Aqueous solution < 3% AgNO₃ as manufactured and/or imported in the EEA market.

6. Information on appearance, physical state and properties of the substance

Table 9. Appearance / physical state / properties of the solid substance

Physical state	Solid
Physical form*	Crystalline
Appearance	Colourless to white crystals
Particle size**	Coarse powder
Does the substance contain 'bound water'?#	No
Does the substance contain 'crystallisation water'?#	No
Does the solid hydrolyse?##	No
Is the solid hygroscopic?§	Yes

* Crystalline form: solid material whose constituent atoms, molecules, or ions are arranged in an ordered pattern extending in all three spatial dimensions. Amorphous form: solid material whose constituent atoms, molecules, or ions are randomly arranged.

** Nanoform: particles in the size range 1 - 100 nm (for full definition of a nanomaterial, see <http://ec.europa.eu/environment/chemicals/nanotech/index.htm#definition>). Fine powder: particles in the size range 100 – 2.500 nm. Coarse powder: particles in the size range 2.500 nm – 1 mm. Massive object: particles in the size range > 1 mm.



'Bound water': water molecules that are coordinated as bound ligands. 'Crystallisation water' or hydration water: water that occurs in crystals (necessary for the maintenance of crystalline properties) but which is not directly bound to the metal ion (a hydrate contains a definite % of crystallisation water e.g. $\text{CuSO}_4 \times 5 \text{H}_2\text{O}$, an anhydride does not contain any water)

Hydrolysis: decomposition (cleavage of chemical bonds) by the addition of water.

§ Hygroscopic substance: readily attracts moisture from its surroundings in open air, through either absorption or adsorption. Cf. also water/moisture content under section 5.

Table 10. Appearance / physical state / properties of the substance in solution*

Physical state	Solution
Solvent	Water
Concentration range of substance in solution	Varies
pH (range) of the solution	Depending on the concentration of the substance in solution (3,5 - 5,5 for a 10% solution)
Excess acid	Depending on the concentration of the substance in solution (< 0,1 % HNO_3 for a 10% solution)

* For liquid substances (solvent cannot be separated from substance without changing the identity of the substance) and not for mixtures, suspensions, and other non-substance forms in which the substance is manufactured and/or imported under REACH

7. Analytical data

Annex VI of REACH requires the registrant to describe the analytical methods and/or to provide the bibliographical references for the methods used for identification of the substance and, where appropriate, for the identification of impurities and additives. This information should be sufficient to allow the methods to be reproduced.

Table 11. Analytical methods for identification of the substance

Parameter / Method	Recommended for substance identification and sameness check	Applicable	Not applicable or not recommended
Elemental analysis			
ICP (ICP-MS or ICP-OES)	X		
Atomic absorption spectroscopy (AAS)			
Glow discharge mass spectrometry (GDMS)			
Molecular analysis			
Infrared (IR) spectroscopy	X		
Raman spectroscopy	X		
Mineralogical analysis			



X-Ray Fluorescence (XRF)			
X-Ray Diffraction (XRD)	X		
Morphology and particle sizing			
Electron microscopy (SEM, TEM, REM)* #			
Laser diffraction* #	X		
Particle size by other means (e.g. sieve analysis)#			
Surface area by N-BET* #			
Other			

* Analytical techniques particularly (but not exclusively) relevant for nanomaterials.

The choice of the technique for particle size depends on the size of the material as manufactured/imported/placed on the market/used.

8. Lead Registrant

Ames Goldsmith UK Ltd. (United Kingdom) volunteers to be the Lead Registrant for Silver nitrate. The EPMF will provide support to the Lead Registrant as laid down in the EPMF Agreement.

9. REACH Strategy

The table below presents the overall Registration Strategy for Silver nitrate based on the information available to the EPMF by the date given above on the document.

The Registration Dossier will be prepared for the highest substance status (information requirements associated to a substance or Article 10 Registration being higher than an intermediate handled under strictly controlled conditions or Article 17 or 18 one) and associated tonnage band.

The recap below therefore reflects the scope of work of the EPMF for Silver nitrate and sets the minimum and maximum set of information that will be gathered and/or produced when preparing the Registration Dossier for Silver nitrate as described in this ID Card.

If higher information requirements are necessary, these can be included in the Registration dossier (if EPMF is made aware of these additional requirements in-time) as an update to the already submitted dossier.

Table 12. REACH strategy for the substance (basis for REACH Registration preparation)

Item	Description
REACH category	Mono-constituent substance
Highest status	Substance
Highest tonnage band	100 – 1000 t/a



Information requirements	Available / Existing + Annex VII – VIII - IX	
Existing classification*	Silver nitrate - Solid, D10 < 250 µm – Ox. Sol. Cat. 1	<p>Ox. Sol. 1 (H271)</p> <p>Met. Corr. 1 (H290)</p> <p>Skin corr. 1B (H314)</p> <p>Aquatic Acute 1 (H400)</p> <p>Aquatic chronic 1 (H410)</p> <p>Acute M-factor 1000</p> <p>Chronic M-factor 100</p>
	Silver nitrate – Solid, D10 > 250 µm – Ox. Sol. Cat. 2	<p>Ox. Sol. 2 (H272)</p> <p>Met. Corr. 1 (H290)</p> <p>Skin corr. 1B (H314)</p> <p>Aquatic Acute 1 (H400)</p> <p>Aquatic chronic 1 (H410)</p> <p>Acute M-factor 1000</p> <p>Chronic M-factor 100</p>
	Silver nitrate – Aqueous solution ≥ 5% AgNO ₃ – No ox. prop. but skin corr. Cat. 1B + Eye dam. Cat. 1	<p>Met. Corr. 1 (H290)</p> <p>Skin corr. 1B (H314)</p> <p>Eye dam. 1 (H318)</p> <p>Aquatic Acute 1 (H400)</p> <p>Aquatic chronic 1 (H410)</p> <p>Acute M-factor 1000</p> <p>Chronic M-factor 100</p>
	Silver nitrate – Aqueous solution ≥ 3 - < 5% AgNO ₃ – No ox. prop. but skin irr. Cat. 2 + Eye dam. Cat. 1	<p>Met. Corr. 1 (H290)</p> <p>Skin irr. 2 (H315)</p> <p>Eye dam. 1 (H318)</p> <p>Aquatic Acute 1 (H400)</p> <p>Aquatic chronic 1 (H410)</p> <p>Acute M-factor 1000</p> <p>Chronic M-factor 100</p>



	Silver nitrate – Aqueous solution < 3% AgNO ₃ – No ox. prop. but skin irr. Cat. 2 + Eye irr. Cat. 2	Met. Corr. 1 (H290) Skin irr. 2 (H315) Eye irr. 2 (H319) Aquatic Acute 1 (H400) Aquatic chronic 1 (H410) Acute M-factor 1000 Chronic M-factor 100
Registration deadline	2010	

* Classification notified (February 2012)

10. Scope of the Registration Dossier

The uses included in this Registration Dossier are summarised in the table below and accompanied with the appropriate text.



Table 13. Reported uses of the substance

Description of use	Sector of Use (SU)	Process Category (PROC)	Environmental Release Category (ERC)
<p>Manufacture and industrial use of silver nitrate solution (e.g. glass making, production of catalysts, production of contact materials, production of photographic materials, uses resulting in inclusion into a matrix)</p>	<ul style="list-style-type: none"> • 3: Industrial uses: Uses of substances as such or in preparations at industrial sites • 5: Manufacture of textiles, leather, fur • 6b: Manufacture of pulp, paper and paper products • 8: Manufacture of bulk, large scale chemicals (including petroleum products) • 9: Manufacture of fine chemicals • 10: Formulation [mixing] of preparations and/or re-packaging (excluding alloys) • 13: Manufacture of other non-metallic mineral products, e.g. plasters, cement • 16: Manufacture of computer, electronic and optical products, electrical equipment • 19: Building and construction work • 20: Health services • 23: Electricity, steam, gas water supply and sewage treatment 	<ul style="list-style-type: none"> • 1: Use in closed process, no likelihood of exposure • 5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) • 7: Industrial spraying • 8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities • 9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) • 13: Treatment of articles by dipping and pouring • 15: Use as laboratory reagent • 18: Greasing at high energy conditions • 19: Hand-mixing with intimate contact and only PPE available. • 22: Potentially closed processing operations with minerals/metals at elevated temperature. Industrial setting • 27b: Production of metal powders (wet processes) • 2: Use in closed, continuous process with occasional controlled exposure • 3: Use in closed batch process (synthesis or formulation) 	<ul style="list-style-type: none"> • 1: Manufacture of substances • 6a: Industrial use resulting in manufacture of another substance (use of intermediates) • 5: Industrial use resulting in inclusion into or onto a matrix



<p>Manufacture and industrial use of silver nitrate crystals (e.g. glass making, production of catalysts, production of contact materials, production of photographic materials, uses resulting in inclusion into a matrix)</p>	<ul style="list-style-type: none">• 3: Industrial uses: Uses of substances as such or in preparations at industrial sites• 5: Manufacture of textiles, leather, fur• 6a: Manufacture of wood and wood products• 8: Manufacture of bulk, large scale chemicals (including petroleum products)• 9: Manufacture of fine chemicals• 10: Formulation [mixing] of preparations and/or re-packaging (excluding alloys)• 13: Manufacture of other non-metallic mineral products, e.g. plasters, cement• 16: Manufacture of computer, electronic and optical products, electrical equipment• 19: Building and construction work• 20: Health services• 23: Electricity, steam, gas water supply and sewage treatment	<ul style="list-style-type: none">• 1: Use in closed process, no likelihood of exposure• 2: Use in closed, continuous process with occasional controlled exposure• 3: Use in closed batch process (synthesis or formulation)• 4: Use in batch and other process (synthesis) where opportunity for exposure arises• 5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)• 8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities• 9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)• 13: Treatment of articles by dipping and pouring• 14: Production of preparations or articles by tableting, compression, extrusion, pelletisation• 15: Use as laboratory reagent• 19: Hand-mixing with intimate contact and only PPE available.• 21: Low energy manipulation of substances bound in materials and/or articles	<ul style="list-style-type: none">• 1: Manufacture of substances• 5: Industrial use resulting in inclusion into or onto a matrix• 6a: Industrial use resulting in manufacture of another substance (use of intermediates)
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<p>Professional uses of silver nitrate solution (e.g. in the photographic sector)</p>	<ul style="list-style-type: none">• 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)	<ul style="list-style-type: none">• 1: Use in closed process, no likelihood of exposure• 2: Use in closed, continuous process with occasional controlled exposure• 3: Use in closed batch process (synthesis or formulation)• 4: Use in batch and other process (synthesis) where opportunity for exposure arises• 5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)• 8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities• 8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities• 9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)• 10: Roller application or brushing• 13: Treatment of articles by dipping and pouring• 15: Use as laboratory reagent• 18: Greasing at high energy conditions• 19: Hand-mixing with intimate contact and only PPE available.• 20: Heat and pressure transfer fluids in dispersive, professional use but closed systems	<ul style="list-style-type: none">• 6a: Industrial use resulting in manufacture of another substance (use of intermediates)
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<p>Professional uses of silver nitrate crystals (e.g. in the photographic sector)</p>	<ul style="list-style-type: none">• 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)	<ul style="list-style-type: none">• 1: Use in closed process, no likelihood of exposure• 2: Use in closed, continuous process with occasional controlled exposure• 3: Use in closed batch process (synthesis or formulation)• 4: Use in batch and other process (synthesis) where opportunity for exposure arises• 5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)• 8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities• 8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities• 9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)• 13: Treatment of articles by dipping and pouring• 14: Production of preparations or articles by tableting, compression, extrusion, pelletisation• 15: Use as laboratory reagent• 19: Hand-mixing with intimate contact and only PPE available.• 20: Heat and pressure transfer fluids in dispersive, professional use but closed systems• 21: Low energy manipulation of substances bound in materials and/or articles• 10: Roller application or brushing	<ul style="list-style-type: none">• 6a: Industrial use resulting in manufacture of another substance (use of intermediates)
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