

Section 1.- Identification of the substance/mixture and of the company

- **Identification of the product:** Silver nanowires solution
- **Chemical family:** Silver and ethanol
- **Product name:** DRP-AGNW
- **Use of the substance/preparation:** Research use only
- **Manufacturer/supplier identification:** Metrohm DropSens, S.L. Vivero de Ciencias de la Salud, Calle Colegio Santo Domingo de Guzmán, s/n, 33010 Oviedo, Asturias, Spain
Tel.- +34 985 27 76 85
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Internet Web Site: www.metrohm-dropsens.com
- **Emergency phone:** Metrohm DropSens, S.L. +34 985 27 76 85

Section 2.- Hazards identification

Classification of the mixture:

According to Regulation CLP (EC) No1272/2008

- Flammable liquids (Category 2)
- Eye irritation (Category 2)

Label elements:



Hazard statements

H225 – Highly flammable liquid and vapour.

H319 – Causes serious eye irritation.

Precautionary statements

P210 – Keep away from heat/Sparks/open flames/hot surfaces. –No smoking.

P403 + P235 – Store in a well-ventilated place and keep cool.

P280 – Wear eye protection/ face protection.

P305 + P338 + P351– If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P337 + P313 – If eye irritation persists get medical advice/ attention.

Supplemental Hazard Statements

None

Section 3.- Composition/Information on ingredients

- **Silver nanowires**
Synonyms: Ag
CAS: - 7440-22-4
Concentration: 8.9 x 10⁸ nanow/ mL

- **Ethanol**
Synonyms: Ethyl alcohol
CAS: 64-17-5
Molecular weight: 46.07 g/mol
EC number: 200-578-6
EC index no: 603-002-00-5
Formula: C₂H₆O
Classification: Flam. Liq. 2, Eye irritation 2 (H225, H319)
Conc. Limits ≥ 50 %, eye irritation 2A

Section 4.- First aid measures

- **General advice:** Consult a physician. Show this safety data sheet to the doctor in attendance.
- **After skin contact:** Wash skin with soap and copious amounts of water. Consult a physician.
- **After ingestion:** Make victim drink plenty of water. Never give anything by mouth to an unconscious person, rinse mouth with water. Consult a physician.
- **After eye contact:** Rinse out with plenty of water with the eyelid held wide open for at least 15 minutes. Summon eye specialist.
- **After inhalation:** Move the person into fresh air. If it is necessary, give artificial respiration with oxygen. Summon physician if necessary.

Section 5.- Fire-fighting measures

- **Suitable extinguishing media:** dry power or dry sand. Do not use water jet.
- **Special hazards arising from the substance:** silver oxides, carbon dioxide and carbon monoxide. May form toxic fumes.
- **Special protective equipment for fire fighting:** Wear self contained breathing apparatus for fire fighting if necessary.
- **Further information:** Use water spray to cool unopened containers.

Section 6.- Accidental release measures

- **Person-related precautionary measures:** Use personal protective equipment. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas.
- **Environmental precautions:** Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.
- **Methods and materials for containment and cleaning up:** Contain spillage and then with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations.
- **Procedures for cleaning/absorption:** Keep in suitable, closed containers for disposal.

Section 7.- Handling and storage

- **Handling:** Avoid eye and skin contact. Avoid inhalation of vapour or mist. Keep away from sources of ignition – No smoking. Take measures to prevent the build-up of electrostatic charge.
- **Storage:** Store in cool place. Keep container tightly closed in a dry and well-ventilated place.

Section 8.- Exposure controls/personal protection

Exposure controls

- Ethanol Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

- Hand protection The selected protective gloves have to satisfy the specification of EU Directive 89/686/EEC and the standard EN 374 derived from it. Handle with gloves.
- Eye protection Safety glasses with side-shields conforming to NIOSH (US) or EN166 (EU)
- Skin and body protection Choose body protection according to the amount and concentration of the dangerous substance at the work place. Handle with gloves. Wash and dry hands. The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and standard EN 374 derived from it.
- Hygiene measures Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Section 9.- Physical and chemical properties

- **General information:**
 - Form: liquid
 - Colour: silver, metallic.
 - Odour: no data available
- **Important health, safety and environmental information:**
 - pH no data available
 - Melting temperature: No data available.
 - Ignition temperature: Not determined.
 - Upper/lower flammability or explosive limits: Upper explosion limit 19%, lower explosion limit 3.3%.
 - Bulk Density: Not data available.
 - Solubility in water (20°C): soluble.
 - Solubility in other solvent: Not determined.
 - Relative vapour density: Not determined.
 - Refractive index: Not determined.

Section 10.- Stability and reactivity

- **Reactivity:** No data available
- **Chemical Stability:** No data available.
- **Possibility of hazardous reactions:** No data available.
- **Incompatible materials:** alkali metals, oxidizing and peroxides.
- **Conditions to avoid:** Heat, flames and sparks. Extremes of temperature and direct sunlight.
- **Hazardous decomposition products:** Other decomposition products – no data available.
- **Further information:** Stable under recommended storage conditions.

Section 11.- Toxicological information

- **Acute toxicity:** No data available.
- **Skin corrosion/irritation:** No data available.
- **Serious eye damage/eye irritation:** may cause moderate eye irritation.
- **Respiratory or skin sensitization:** No data available.
- **Germ cell mutagenicity:** No data available.
- **Carcinogenicity:** No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
- **Specific target organ toxicity – single exposure:** No data available.
- **Specific target organ toxicity – repeated exposure:** No data available.
- **Aspiration hazard:** No data available.
- **Potential health effects**
 - **Skin corrosion/irritation:** toxic if absorbed through skin. May cause skin irritation.
 - **Inhalation:** toxic if inhaled. May cause respiratory tract irritation.
 - **Ingestion:** toxic if swallowed.
 - **Serious eye damage/eye irritation:** causes eye irritation.
- **Additional Information:** RTECS - No data available.

Section 12.- Ecological information:

To the best of our knowledge the ecological effects have not been thoroughly researched.
Avoid contact with water, wastewaters or soil.

Toxicity:

Toxicity to fish LC50 - Pimephales promelas (fathead minnow) - 14.200 mg/l - 96 h

Toxicity to daphnia and other aquatic invertebrates Daphnia toxicity: Daphnia magna EC₅₀: 1 mg/l / 48h.

Bioaccumulative potential: no data available

Persistence and degradability: no data available.

Mobility in soil: no data available.

Results of PBT and vPvB assessment: no data available.

Other adverse effects: no data available.

Section 13.- Disposal considerations

- **Product:** Observe all federal, state, and local environmental regulations. Contact a licensed professional waste disposal service to dispose this material.
- **Contaminated packaging:** Dispose of as unused product.

Section 14.- Transport information

- **Road transport (ADR/RID)** UN-No: 1170
ADR class: 1170
Correct technical name: Ethanol
Transport hazard class: 3
Packaging group: II
- **Sea transport (IMDG)** UN-No: 1170
Correct technical name: Ethanol
- **Air transport (IATA)** UN-No: 1170
Correct technical name: Ethanol

Section 15.- Regulatory information

This safety datasheet has been revised to comply with the requirements establish in (EC) 453/2010.

Section 16.- Other information

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The contents and format of this MSDS are in accordance with EC 453/2010.

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