

## MATERIAL SAFETY DATA SHEET

**Revision Number: 1.3**  
**Revision Date: September 24, 2015**

### Section 1 – Product and Company Information

Product Name: Silver Nanoflower (Multifaceted Silver)  
Catalog Number: 208SF  
Unit Size: 10 mL  
Manufacturer/Supplier: Sciventions Inc.  
60 St. George Street, Suite 331, Toronto, ON, M5S 1A7  
Phone: (647) 947-4866  
Web: <http://www.sciventions.com>  
Technical Assistance: [sales@sciventions.com](mailto:sales@sciventions.com)  
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### Section 2 – Composition, Information on Ingredients

Component A: Water  
CAS 7732-18-5, 99%+ by weight

Component B: Silver (as nanocrystal compound)  
CAS (Silver) 7440-22-4; < 0.1 % by weight

### Section 3 – Hazards Identification

Emergency Overview:  
Colour: Yellow to orange  
Physical form: Liquid

Major Health Hazards: Slightly toxic. Not a suspected carcinogen according to NIOSH.

Physical Hazards: None.

Potential toxicity: While no health effects have been determined for nanocrystalline forms of this material, it is recommended that appropriate precautions be taken to limit exposure to this material.

Inhalation: No data available.

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Skin contact: No data available.

Eye contact: No data available.

Ingestion: No data available.

Carcinogen status:

OSHA: No

NTP: No

IARC: No

Some research exists that suggests that silver may be a questionable carcinogen.

### Section 4 – First Aid Measures

Eye contact: If this chemical gets into the eyes, remove any contact lenses at once and irrigate immediately for at least 15 minutes, occasionally lifting upper and lower lids. Seek medical attention immediately.

Skin contact: If this chemical contacts the skin, remove contaminated clothing and wash immediately with soap and water. Seek medical attention immediately. Inhalation: If this chemical has been inhaled, remove from exposure, begin rescue breathing (using universal precautions) if breathing has stopped and CPR if heart action has stopped. Transfer promptly to a medical facility.

Ingestion: When this chemical has been swallowed, get medical attention. Give large quantities of water and induce vomiting. Do not make an unconscious person vomit.

### Section 5 – Fire Fighting Measures

Material does not burn.

### Section 6 – Accidental Release Measures

Use personal protection recommended in Section 8. Isolate the hazard area and deny entry to unnecessary and unprotected personnel. Absorb spill onto an appropriate material. Collect and dispose of all waste in accordance with applicable laws. This material is a water pollutant; keep out of drains, sewers, ditches, and waterways.

### Section 7 – Handling and Storage

For improved performance, store at 2-6°C away from sunlight. Use appropriate laboratory work practices, including wearing of laboratory coats, gloves, and protective eyewear.

### Section 8 - Exposure Controls/Personal Protection:

No exposure limits have been determined for nanocrystalline forms of this material. The below exposure limits are based off the individual chemical components. It is recommended that appropriate precautions be taken to limit exposure to this material.

#### *Exposure limits:*

#### Silver:

OSHA PEL: Metal, Dust, and Fume: TWA 0.01 mg/m<sup>3</sup>  
ACGIH TLV: TWA (metal) 0.1 mg/m<sup>3</sup>, (soluble compounds as Ag) 0.01 mg/m<sup>3</sup>  
DFG MAK: 0.1 mg/m<sup>3</sup>; (salts) 0.01 mg/m<sup>3</sup>  
NIOSH REL: (Silver, metal and soluble compounds) TWA 0.01 mg/m<sup>3</sup>

#### *Protective equipment:*

Wear appropriate gloves, protective clothing and eyewear and follow safe laboratory practices. Emergency eye wash station and quick drench shower should be provided in the immediate work area as per the ANSI Z358.1 guidelines.

### Section 9 – Physical and Chemical Properties

Physical State: Liquid

Colour: Milky

Odor: Not known.

Boiling Point: 100 °C (~ 212 F)

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Freezing Point: 0 °C (~ 32 F)

Vapour pressure: N/A

Specific gravity (water = 1): ~ 1.0

pH: ~ 7-8

### Section 10 – Reactivity

Chemical stability: Stable if used according to specifications.

Conditions to avoid: None known.

Incompatible Materials: Attacked by Cl<sub>2</sub>, S, H<sub>2</sub>S, metal cyanides (in air), chromic, nitric, and sulfuric acids. Incompatible with acetylene, acetylene compounds, aziridine, bromine azide, 3-bromopropyne, carboxylic acids, copper + ethylene glycol, electrolytes + zinc, ethanol + nitric acid, ethylene oxide, ethyl hydroperoxide, ethyleneimine, iodoform, nitric acid, ozonides, peroxomonosulfuric acid, peroxyformic acid.

Hazardous decomposition products: No hazardous decomposition products have been identified.

### Section 11 – Toxicological information:

No health effects have been determined for nanocrystalline forms of this material. It is recommended that appropriate precautions be taken to limit exposure to this material. The below toxicological information is for the equivalent bulk material.

Short Term Exposure: Causes irritation of the eyes, skin and respiratory tract. Ingestion of dust can cause gastrointestinal disturbance.

Long Term Exposure: Silver can affect you when breathed in. Repeated exposure to fine silver dust or fumes can cause blue-gray staining of the eyes, mouth, throat, internal organs and skin. This occurs slowly and may take years to develop. Once present, it does not go away. It can be very disfiguring. Skin contact can cause silver to become imbedded in small cuts in the skin, forming a permanent tattoo. Can cause sores on the inner lining of the nose and may cause perforation of the nasal septum.

Points of Attack: Nasal septum, skin, eyes.

Medical Surveillance: Before beginning employment and at regular times after that, for those with frequent or potentially high exposures, the following are recommended: Slit lamp exam by an eye doctor.

Exam of the skin, nose and throat. If symptoms develop or overexposure is suspected, the following may be useful: kidney function tests.

Some research exists that suggests silver may be a questionable carcinogen.

### **Section 12 – Ecological Information:**

Do not allow material to be released to the environment in any form without proper permits and waste-disposal precautions.

### **Section 13 – Transportation Information:**

U.S. DOT: Not regulated

Canadian Transportation of Dangerous Goods: Not regulated

### **Section 14 – Disposal:**

Dispose in accordance with all local, state/provincial and federal regulations. Considered dangerous to the environment.

### **Section 15 – Regulatory Information:**

#### U.S. Regulations

CERCLA: No

TSCA listed: Yes

Sara Title III, sec 302, 304: No

#### Canadian Regulations

DSL listed: Yes

NDSL listed: No

WHMIS classification: D2A

#### European Regulations

EINECS No.: 231-131-3

Classification: Not classified

### **Section 16 – Other Information:**

References used to prepare this MSDS include:

Lewis, Richard J., Sr, (2003). Sax's Dangerous Properties of Industrial Materials (10th Edition) Volumes 1-3. John Wiley & Sons.

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Online version available at:

<http://www.knovel.com/knovel2/Toc.jsp?BookID=707&VerticalID=0>

Pohanish, R.P. (2002). Sittig's Handbook of Toxic and Hazardous Chemicals and Carcinogens (4th Edition). William Andrew Publishing/Noyes.

Online version available at:

<http://www.knovel.com/knovel2/Toc.jsp?BookID=421&VerticalID=0>

CHEMLIST database through

<http://www.cas.org/CASFILES/chemlist.html>

ECB-ESIS: European Chemical Substances Information System at

<http://ecb.jrc.it/esis/esis.php?PGM=ein>

Canadian WHMIS reference manual

CDC Immediately Dangerous to Life of Health concentrations for Silver (<http://www.cdc.gov/niosh/idlh/7440224.html>)

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