

# Safety Data Sheet

acc. to OSHA

## **1 - Identification of Substance:**

Product Identifiers: Silver Nanowires & Ethanol  
Formula: AG  
Chemical Family: Silver Nanowires  
Synonyms: AG nanowires, AGNWs, Silver Nws, Silver Nanowires, Silver Nanoparticles  
CAS Number: 7440-22-4 & 64-17-5

### **Manufacturer/Supplier:**

**Cheap Tubes Inc.**  
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Revision Date: February 17, 2016

All Materials Sold by Cheap Tubes Inc are for Research & Development Only.

## **2 - Hazards Identification**

**OSHA Status:** This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200)

**Classification:** Flammable Liquid 2

### **Potential Health Effects**



**Signal Word- Danger**

**Eye Contact:** May cause eye irritation or blue-gray eyes.

**Skin Contact:** May cause skin irritation or ulceration.

**Inhalation:** May be harmful if inhaled. Material may be irritating to nasal septum, throat, mucous membranes and upper respiratory tract.

**Ingestion:** May be harmful if swallowed. May cause gastrointestinal irritation with nausea, vomiting and diarrhea.

**Chronic Exposure:** Absorption of silver compounds by ingestion, inhalation or through broken skin can cause argyria, a permanent bluish-gray discoloration of the skin, conjunctiva and mucous membranes.

**Prevention:** Wear protective gloves. Wear eye or face protection. Keep away from heat, sparks, open flames and hot surfaces. - No smoking. Use explosion-proof electrical, ventilating, lighting and all material-handling equipment. Use only non-sparking tools. Take precautionary measures against static discharge. Keep container tightly closed. Use and store only outdoors or in a well ventilated place.

**Information pertaining to particular dangers for man and environment R 36/37 Irritating to eyes and respiratory system.**

### **3 - Composition/Data on Components:**

**Chemical Characterization:**

**Description: (CAS#) 7440-22-4**

<u>Component</u>	<u>%</u>
Silver	0.1-5%
Ethanol	up to 99.9%

Appearance: colorless clear liquid. Flash Point: 16.6 deg C.

Flammable liquid and vapor.

May cause central nervous system depression. Causes severe eye irritation. Causes respiratory tract irritation. Causes moderate skin irritation.

This substance has caused adverse reproductive and fetal effects in humans.

Warning!

May cause liver, kidney and heart damage.

Target Organs:

Kidneys, heart, central nervous system, liver.

### **4 - First Aid Measures**

**After inhalation**

Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Seek medical attention immediately.

**After skin contact**

Flush with copious amounts of soap and water for at least 15 minutes. Remove contaminated clothing and shoes. Seek medical attention if irritation develops or persists. Wash clothing before reuse. Thoroughly clean shoes before reuse.

**After eye contact** Flush with copious amounts of water for at least 15 minutes, occasionally lifting lower

and upper eyelids. Seek medical attention immediately.

**After swallowing** If conscious, wash out mouth with water. Seek medical attention immediately

## **5 - Fire Fighting Measures**

Fire: Highly flammable liquid and vapor. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. The vapor/gas is heavier than air and will spread along the ground. Vapors may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back. Runoff to sewer may create fire or explosion hazard

Explosion: This material, like most materials in powder form, is capable of creating a dust explosion.

Fire Extinguishing Media: Sand or dry powder type specially designed for metal powder fires. Do not use water.

Special Information: In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full face piece operated in the pressure demand or other positive pressure mode.

NFPA Ratings: Health=2, Flammability=3, Reactivity=1

## **6 - Accidental Release Measures**

**In case of a leak or spill, evacuate area, shut off all sources of ignition and use nonsparking tools.** Wear eye protection, self-contained breathing apparatus, boots, and protective gloves. Wear disposable coveralls and discard after use. Sweep up the spill, place in a bag and hold for waste disposal. Avoid raising dust. Ventilate area and wash spill site after material pick-up is complete. Do not let this chemical enter the environment.

## **7 - Handling and Storage**

Store in a tightly closed container in a cool, dry, ventilated area. Protect from physical damage, ignition sources and electrostatic discharges. Isolate from incompatible substances. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

Handling:

Wash thoroughly after handling. Use only in a well-ventilated area. Ground and bond containers when transferring material. Use spark-proof tools and explosion proof equipment. Avoid contact with eyes, skin, and clothing.

Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep container tightly closed.

Avoid contact with heat, sparks and flame. Avoid ingestion and inhalation. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames.

Storage:

Keep away from heat, sparks, and flame. Keep away from sources of ignition. Store in a tightly closed container.

Keep from contact with oxidizing materials. Store in a cool, dry, well-ventilated area away from incompatible substances.

Flammables-area. Do not store near perchlorates, peroxides, chromic acid or nitric acid.

## 8 - Airborne Exposure Limits:

**Engineering Controls:** Use explosion-proof ventilation equipment. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name ACGIH

NIOSH

OSHA - Final PELs

Ethyl alcohol

1000 ppm TWA

1000 ppm TWA; 1900 mg/m<sup>3</sup> TWA 3300 ppm IDLH

1000 ppm TWA; 1900 mg/m<sup>3</sup> TWA

Water

none listed

none listed

none listed

OSHA Vacated PELs:

Ethyl alcohol: 1000 ppm TWA; 1900 mg/m<sup>3</sup> TWA Water: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face

protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing:

Wear appropriate protective clothing to prevent skin exposure.

Respirators:

A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant a respirator's use

## **12 - Ecological information:**

### **General notes:**

**Do not allow this material to be released to the environment!**

This substance may be hazardous to the environment; special attention should be given to aquatic organisms

Ecological information on carbon nanotubes may be found at the website of the International Council on Nanotechnology at <http://icon.rice.edu/>. Cheap Tubes recommends the use of Hazardous Materials Remediation companies for dealing with Nano Waste. Companies such as Safety Kleen are good companies to dispose of your Nano waste with.

## **13 - Disposal considerations**

All components of this product are listed in the U.S. Environmental Protection Agency Toxic Substances Control Act Chemical Substance Inventory. This material and its container must be disposed of as hazardous waste. Processing, use, or contamination of this product may change the waste management options.

### **Recommendation:**

Disposal must be made according to official regulations. Contact a hazardous materials removal company. Keep all silver nanowire waste, packaging, and contaminated items segregated from other waste and dispose of with a materials removal company such as Saftey Kleen or others.

## **14 - Transport information**

UN number 1170

UN proper shipping name :Ethanol Solutions

Transport hazard class(es) 3

Packing group (if applicable) II

IMDG

UN-Number: 1170 Class: 3 Packing Group: II

EMS-No: F-E, S-D

Proper shipping name: Ethanol Solutions

Marine pollutant: No

IATA

UN-Number: 1170 Class: 3 Packing Group: II

Proper shipping name: Ethanol Solutions

## **15 - Regulations**

### US FEDERAL

#### TSCA

CAS# 64-17-5 is listed on the TSCA inventory.

CAS# 7732-18-5 is listed on the TSCA inventory.

#### Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

#### Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

#### Section 12b

None of the chemicals are listed under TSCA Section 12b.

#### TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

#### SARA

##### CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

##### SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

#### SARA Codes

CAS # 64-17-5: acute, chronic, flammable.

#### Section 313

No chemicals are reportable under Section 313.

#### Clean Air Act:

This material does not contain any hazardous air pollutants. This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

#### Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA. None of the chemicals in this

product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic

Pollutants under the CWA.

#### OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

### STATE

CAS# 64-17-5 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

CAS# 7732-18-5 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

WARNING: This product contains Ethyl alcohol, a chemical known to the state of California to cause birth

NFPA Ratings: Health=2, Flammability=3, Reactivity=1

## **16 - Other Information:**

Hazard Statement

H225 Highly flammable liquid and vapour.

H319 Causes serious eye irritation.

Additional Information : This document contains important information to ensure the safe storage, handling and use of this product. The information

### **Label Precautions:**

Do not get in eyes, on skin or on clothing.

Do not breathe fumes

Wash thoroughly after handling.

Keep container closed.

Use with adequate ventilation.

No Smoking

Use explosion-proof electrical, ventilating, lighting and all material-handling equipment. Use only non-sparking tools.

### **Label First Aid:**

If inhaled, remove to fresh air. If breathing difficulties persist, get medical attention. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. If irritation develops or persists, get medical attention.

**Disclaimer:** Cheap Tubes Inc. believes that the information in this Material Safety Data Sheet is accurate and represents the best and most current information available to us. Cheap Tubes Inc makes no representations or warranties either express or implied, regarding the suitability of the material for any purpose or the accuracy of the information contained within this document. Accordingly, Cheap Tubes Inc will not be responsible for damages resulting from use of or reliance upon this information.