

# Electroless Nickel-Tungsten Plating Solution

Safety Data Sheet

## Section 1: Identification

### 1.1 Identification

Product Name : Electroless Nickel-Tungsten Plating Solution

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

Use of the substance/mixture : Electroless Nickel-Tungsten Plating

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

Nano3D Systems LLC  
1110 NE Cirlce Blvd., ATAMI/Bldg. 11  
Corvallis, OR 97330

### 1.4 Emergency telephone number

Emergency number : CHEMTREC: 1-800-424-9300

## Section 2: Hazard(s) identification

### 2.1 Classification of the substance or mixture

#### Classification (GHS-US)

Acute toxicity, Oral (Category 4)	H302
Skin sensitization (Category 1)	H317
Respiratory sensitization (Category 1)	H334
Carcinogenicity (Category 2B)	H350
Reproductive toxicity (Category 1B)	H360
Acute aquatic toxicity (Category 1)	H400
Chronic aquatic toxicity (Category 1)	H410

### 2.2 Label elements

#### GHS-US labeling

Hazard pictogram (GHS-US)



Signal word (GHS-US) : Danger

Hazard statements (GHS-US) :

- H302+H332 – Harmful if swallowed or if inhaled.
- H317 – May cause an allergic skin reaction.
- H334 – May cause allergy or asthma symptoms or breathing difficulties if inhaled
- H351 – Suspected of causing cancer
- H360 – May damage fertility or the unborn child.
- H372 – Causes damage to organs through prolonged or repeated exposure if inhaled
- H410 – Very toxic to aquatic life with long lasting effects

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Precautionary statements (GHS-US)

- : P201 – Obtain special instructions before use.
- : P202 – Do not handle until all safety precautions have been read and understood.
- : P264 – Wash skin thoroughly after handling.
- : P270 – Do not eat, drink or smoke when using this product.
- : P271 – Use only outdoors or in a well-ventilated area
- : P272 – Contaminated work clothing should not be allowed out of the workplace
- : P273 – Avoid release to the environment.
- : P280 – Wear protective gloves/protective clothing/ eye protection/face protection.
- : P285 – In case of inadequate ventilation wear respiratory protection.
- : P301 + P312 + P330 – If swallowed: Call a Poison center or doctor/physician if you feel unwell. Rinse mouth.
- : P302 + P352 – If on skin: Wash with plenty of soap and water.
- : P304 + P341+P312 – If inhaled: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a Poison center/doctor if you feel unwell.
- : P308 + P313 – If exposed or concerned: Get medical advice/attention.
- : P333 + P313 – If skin irritation or rash occurs: Get medical advice/attention.
- : P362 – Take off contaminated clothing and wash before reuse.
- : P391 – Collect spillage.
- : P405 – Store locked up.
- : P501 – Dispose of contents/container to an approved waste disposal plant.

### 2.3 Other Hazards

No additional information available

### 2.4 Unknown acute toxicity (GHS US)

No additional information available

## Section 3: Composition/information on ingredients

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### 3.1 Substance

Not applicable

### 3.2 Mixture

Name	Product Identifier	%	Classification (GHS-US)
Nickel(II) Sulfate Heptahydrate	(CAS-No.) 10101-98-1	Trade Secret	Acute Tox. 4; Skin Irrit. 2; Resp. Sens. 1; Skin Sens. 1; Carc. 2; Repr. 1B; STOT RE 1; Aquatic Acute 1; Aquatic Chronic 1; H302 + H332, H315, H317, H334, H351, H360, H372, H410
Sodium Tungstate Dihydrate	(CAS-No.) 10213-10-2	Trade Secret	Acute Tox. 4; H302
Sodium Hypophosphite	(CAS-No.) 10039-56-2	Trade Secret	none
Sodium Citrate	(CAS-No.) 6132-04-3	Trade Secret	none

## Section 4: First Aid Measures

### 4.1 Description of first aid measures

General	: Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.
Inhalation	: If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.
Skin contact	: Wash off with soap and plenty of water. Consult a physician.
Eye contact	: Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.
Ingestion	: Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician

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

Inhalation	: May cause allergy or asthma symptoms or breathing difficulties if inhaled
Skin contact	: May cause an allergic reaction

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Eye contact : Causes serious eye damage

Ingestion : Harmful if swallowed

### 4.3 Indication of any immediate medical attention and special treatment needed

No further information available

## Section 5: Firefighting measures

### 5.1 Extinguishing media

Suitable extinguishing media : Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Unsuitable extinguishing media : None

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

Fire hazard : Nickel oxide, sulfur oxides, sodium oxides, tungsten oxides, phosphorous oxides, carbon oxides

Explosion hazard : No information available

### 5.3 Advice for firefighters

Protection during firefighting : Wear self-contained breathing apparatus for firefighting if necessary.

## Section 6: Accidental release measures

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

6.1.1 For non-emergency personnel : Use personal protective equipment. Avoid dust formation. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.

6.1.2 For emergency personnel : No additional information available

### 6.2 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.

### 6.3 Methods and materials for containment and cleaning up

Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

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### 6.4 Reference to other sections

For disposal see section 13.

## Section 7: Handling and storage

### 7.1 Precautions for safe handling

Precautions for safe handling

: Avoid contact with skin and eyes. Avoid formation of aerosols.

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

Storage conditions

: Keep container tightly closed in a dry and well-ventilated place.

Air sensitive. hygroscopic Handle and store under inert gas.

Storage class (TRGS 510): Non Combustible acute toxic Cat.3/toxic hazardous materials or hazardous materials causing chronic effects

## Section 8: Exposure controls/personal protection

### 8.1 Control parameters

#### Nickel Sulfate Heptahydrate (CAS-No.) 10101-98-1

TWA

1.00 mg/m<sup>3</sup>

USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants

#### Disodium Wolframate Dihydrate (CAS-No.) 10213-10-1

TWA

1.00 mg/m<sup>3</sup>

USA. ACGIH Threshold Limit Values (TLV)

#### Sodium Hypophosphate monohydrate (CAS-No.) 10039-56-2

No exposure limit values

#### Sodium Citrate Dihydrate (CAS-No.) 6132-04-3

No exposure limit values

### 8.2 Exposure controls

Appropriate engineering controls

: Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

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### Hand protection

: Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

### Eye protection

: Safety glasses with side-shields conforming to EN166 Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

### Skin and body protection

: Complete suit protecting against chemicals, the type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

### Respiratory protection

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

## Section 9: Physical and chemical properties

### 9.1 Information on basic physical and chemical properties

Physical state	: Liquid
Color	: Bluish-green
Odor	: No information available
Odor threshold	: No information available
pH	: 6.8
Melting point	: No information available
Freezing point	: No information available
Boiling point	: No information available
Flash point	: No information available
Relative evaporation rate (butyl acetate = 1)	: No information available
Flammability (solid, gas)	: No information available
Explosion limits	: No information available
Explosive properties	: No information available
Vapor pressure	: No information available
Relative density	:
Relative vapor density at 20 °	:
Solubility	: Miscible
Log Pow	: No information available
Auto-ignition temperature	: No information available
Viscosity	: No information available

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Viscosity, kinematic

: No information available

Viscosity, dynamic

: No information available

## 9.2 Other information

No further information available

## Section 10: Stability and reactivity

### 10.1 Reactivity

No information available

### 10.2 Chemical Stability

Stable under recommended storage conditions.

### 10.3 Possibility of hazardous reactions

No information available

### 10.4 Conditions to avoid

No information available

### 10.5 Incompatible materials

Strong oxidizing agents, Potassium, Acid anhydrides

### 10.6 Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - Sulphur oxides, Nickel oxides, Tungsten oxides, Sodium Oxides, Carbon oxides

## Section 11: Toxicological information

### 11.1 Control parameters

Acute toxicity

: No information available

#### Nickel Sulfate Heptahydrate (CAS-No.) 10101-98-1

No information available

#### Disodium Wolframate Dihydrate (CAS-No.) 10213-10-1

LD50 Oral - Rat - 1,453 mg/kg

LC50 Inhalation - Rat - 4 h - > 5,010 mg/m<sup>3</sup>

LD50 Subcutaneous - Rat - 251 mg/kg

#### Sodium Hypophosphate monohydrate (CAS-No.) 10039-56-2

LD50 Oral Rat > 1000 mg/kg

LD50 Dermal Rabbit > 2000 mg/kg

#### Sodium Citrate Dihydrate (CAS-No.) 6132-04-3

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Skin corrosion/irritation	: Causes skin corrosion
Serious eye damage/irritation	: Risk of serious damage to eyes
Respiratory or skin sensitization	: Prolonged or repeated exposure may cause allergic reactions in certain sensitive individuals.
Germ cell mutagenicity	: Hamster, Other cell types, morphological transformation
Carcinogenicity	: Carcinogen  Limited evidence of carcinogenicity in animal studies  IARC: 1 - Group 1: Carcinogenic to humans (Nickel(II) sulfate heptahydrate)  NTP: Known to be human carcinogen (Nickel(II) sulfate heptahydrate)
Reproductive toxicity	: Presumed human reproductive toxicant
Specific target organ toxicity (single exposure)	: No information available
Specific target organ toxicity (repeated exposure)	: No information available
Aspiration hazard	: No information available
<b>Additional information</b>	
No additional information	

## Section 12: Ecological information

### 12.1 Toxicity

#### Nickel Sulfate Heptahydrate (CAS-No.) 10101-98-1

No information available

#### Disodium Wolframate Dihydrate (CAS-No.) 10213-10-1

No information available

#### Sodium Hypophosphate monohydrate (CAS-No.) 10039-56-2

No information available



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**Sodium Citrate Dihydrate (CAS-No.) 6132-04-3**

No information available

### 12.2 Persistence and degradability

**Nickel Sulfate Heptahydrate (CAS-No.) 10101-98-1**

Not readily biodegradable

**Disodium Wolframate Dihydrate (CAS-No.) 10213-10-1**

No information available

**Sodium Hypophosphate monohydrate (CAS-No.) 10039-56-2**

No information available

**Sodium Citrate Dihydrate (CAS-No.) 6132-04-3**

No information available

### 12.3 Bioaccumulative potential

**Nickel Sulfate Heptahydrate (CAS-No.) 10101-98-1**

No information available

**Disodium Wolframate Dihydrate (CAS-No.) 10213-10-1**

No information available

**Sodium Hypophosphate monohydrate (CAS-No.) 10039-56-2**

No information available

**Sodium Citrate Dihydrate (CAS-No.) 6132-04-3**

No information available

### 12.4 Mobility in soil

**Nickel Sulfate Heptahydrate (CAS-No.) 10101-98-1**

No information available

**Disodium Wolframate Dihydrate (CAS-No.) 10213-10-1**

No information available

**Sodium Hypophosphate monohydrate (CAS-No.) 10039-56-2**

No information available

**Sodium Citrate Dihydrate (CAS-No.) 6132-04-3**

No information available

### 12.4 Other adverse effects

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An environmental hazard cannot be excluded in the event of unprofessional handling or disposal. Very toxic to aquatic life. May be harmful to aquatic organisms due to the shift of the pH. Avoid release to the environment.

### Section 13: Disposal considerations

#### 13.1 Waste treatment methods

##### Product

Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

##### Contaminated packaging

Dispose of as unused product.

### Section 14: Transportation information

#### 14.1 Transportation information

##### Department of Transportation (DOT)

Not dangerous goods

##### IMDG

IMDG UN number: 3077    Class: 9    Packing group: III    EMS-No: F-A, S-F

Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Nickel sulfate)

Marine pollutant: yes

### Section 15: Regulatory information

#### 15.1 US Federal regulations

##### Nickel Sulfate Heptahydrate (CAS-No.) 10101-98-1

SARA Title III, Section 313

SARA 311/312 Hazards Acute Health Hazard, Chronic Health Hazard

##### Disodium Wolframate Dihydrate (CAS-No.) 10213-10-1

SARA 311/312 Hazards Acute Health Hazard

##### Sodium Hypophosphate monohydrate (CAS-No.) 10039-56-2

None

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**Sodium Citrate Dihydrate (CAS-No.) 6132-04-3**

None

## 15.2 US State regulations

**Nickel Sulfate Heptahydrate (CAS-No.) 10101-98-1**

Massachusetts Right To Know

Pennsylvania Right To Know

New Jersey Right To Know

California Prop 65

**Disodium Wolframate Dihydrate (CAS-No.) 10213-10-1**

Pennsylvania Right To Know

New Jersey Right To Know

**Sodium Hypophosphate monohydrate (CAS-No.) 10039-56-2**

Pennsylvania Right To Know

New Jersey Right To Know

**Sodium Citrate Dihydrate (CAS-No.) 6132-04-3**

Pennsylvania Right To Know

New Jersey Right To Know

## Section 16: Other information

### HMIS Rating

Health	2
Chronic Health	*
Flammability	0
Physical	0

### NFPA Rating

Health	2
Fire	0
Reactivity	0

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**SDS Preparation date:** March 1, 2017 **Supersedes previous version:** New SDS

**This SDS contains revisions in the following sections(s):** Not applicable. New SDS.

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