

## SPI Supplies Division

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Manufacturer's CAGE: 1P573

## Safety Data Sheet

Date Effective: April 22, 2019

SPI Catalog # 02546-AA, 02546-AB  
SPI-Chem™ Uranyl Nitrate Hexahydrate  
(Depleted Uranium),

### Section 1.1: Identification

Chemical Name/Synonyms: ..... Uranyl Nitrate Hexahydrate

Product or Trade Name: SPI-Chem™ Uranyl Nitrate Hexahydrate

CAS #'s ..... 13520-83-7

Chemical Formula..... N<sub>2</sub>O<sub>8</sub>U·6H<sub>2</sub>O

RTECS #: YR3850000

### Section 1.2: Relevant Uses/Restrictions

Used as an electron dense stain for transmission electron microscopy.

### Section 1.3: Supplier of the Safety Data Sheet

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### Section 1.4: Emergency telephone number

Emergencies

Contacting CHEMTREC:

24 Hour Emergency Use Only #'s...

Worldwide phone: 1-(703)-741-5970

Toll-free phone: 1-(800)-424-9300 USA + Canada only

### Section 2: Hazard Identification

#### 2.1 Classification of the substance

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS):

Oxidizing solids (Category 2), H272

Acute toxicity, Oral (Category 2), H300

Acute toxicity, Inhalation (Category 2), H330  
Specific target organ toxicity – repeated exposure (Category 2), H373  
Acute aquatic toxicity (Category 2), H401  
Chronic aquatic toxicity (Category 2), H411

## 2.2 Label elements

### Pictogram



**Signal Word:** Danger

### Hazard statements:

H272 May intensify fire; oxidizer.  
H300 + H330 Fatal if swallowed or if inhaled.  
H373 May cause damage to organs through prolonged or repeated exposure  
H401 Toxic to aquatic life.  
H411 Toxic to aquatic life with long lasting effects.

### Precautionary statements:

P210 Keep away from heat.  
P220 Keep/Store away from clothing/ combustible materials.  
P221 Take any precaution to avoid mixing with combustibles.  
P260 Do not breathe dust/ fume/ gas/ mist/ vapors/ spray.  
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.  
P273 Avoid release to the environment.  
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.  
P284 Wear respiratory protection.  
P301 + P310 IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.  
P304 + P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.  
P310 Immediately call a POISON CENTER or doctor/physician.  
P320 Specific treatment is urgent (see supplemental first aid instructions on this label).  
P330 Rinse mouth.  
P370 + P378 In case of fire: Use dry sand, dry chemical, or alcohol-resistant foam for extinction.  
P391 Collect spillage.  
P403 + P233 Store in a well-ventilated place. Keep container tightly closed.  
P405 Store locked up.  
P501 Dispose of contents/ container to an approved waste disposal plant.

**2.3 Hazards not otherwise classified (HNOC) or not covered by GHS:** Radioactive

**Hazardous Material Information System USA**

Health ..... 3\* (\* Chronic Health Hazard)  
Fire Hazard ..... 0  
Reactivity ..... 3  
Personal Protection .....

**NFPA Rating (estimated)**

Health ..... 3  
Flammability..... 0  
Reactivity ..... 3  
Special hazard.I:..... OX

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. SPI Supplies / Structure Probe Inc. shall not be held liable for any damage resulting from handling or from contact with the above product.

**Section 3: Composition**

**3.1 Substances:**

Component Name	CAS #	%	EC#
Uranyl Nitrate Hexahydrate	13520-83-7	98.0-102.0	233-266-3

Formula: N<sub>2</sub>O<sub>8</sub>U · 6H<sub>2</sub>O      Molecular weight: 502.13 g/mol

Index-No.: 092-002-00-3

**Section 4: First Aid Measures**

**4.1 Description of first aid measures:**

**General advice:**

- 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.
- Take victim immediately to hospital.
- Consult a physician.

**Eye Contact:**

- Flush eyes with water as a precaution.

**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:**

The most important known symptoms and effects are described in the labelling (see Section 2.2) and/or in Section 11.

**4.3 Indication of any immediate medical attention and special treatment needed:**

No data available.

## ***Section 5: Fire Fighting Measures***

**5.1 Extinguishing media:**

Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

**5.2 Special hazards arising from the substance or mixture:**

Nitrogen oxides (NO<sub>x</sub>), Uranium oxides.

**5.3 Hazardous combustion products:**

No further relevant information available.

**5.4 Advice for firefighters:**

Wear self-contained breathing apparatus for firefighting if necessary.

**5.5 Further information:**

Use water spray to cool unopened containers. The product itself does not burn.

## ***Section 6: Accidental Release Measures***

**6.1 Personal precautions:**

Wear respiratory protection.  
Avoid dust formation.  
Avoid breathing vapors, mist, or gas.  
Ensure adequate ventilation.  
Evacuate personnel to safe areas.  
Avoid breathing dust.

**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 material for containment and cleaning up:**

Sweep up and shovel.  
Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing, and then place in container for disposal according to local regulations.  
Keep in suitable, closed containers for disposal.

**6.4 Reference to other sections:**

See Section 8 for personal protection.  
See Section 13 for disposal information.

## **Section 7: Handling and Storage**

### **7.1 Precautions for safe handling:**

#### **Protective measures:**

Avoid contact with skin and eyes.  
Avoid formation of dust and aerosols.  
Provide appropriate exhaust ventilation at places where dust is formed.  
Keep away from heat and sources of ignition. – No smoking.  
For precautions, see Section 2.2.

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

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

### **7.3 Specific end uses:**

Used as an electron dense stain for transmission electron microscopy.

This material is not being offered for clinical or diagnostic applications, agricultural uses or for human or animal consumption.

## **Section 8: Exposure Controls and Personal Protection**

### **8.1 Control parameter and Personal Protection:**

#### **Workplace exposure limits:**

Component name: Uranyl Nitrate Hexahydrate [Bis(nitrato-O)dioxouranium hexahydrate]

CAS #: 13520-83-7

ACGIH Threshold Limit Values (TLV):	TWA 0.05 mg/m <sup>3</sup>	Remark: Confirmed human carcinogen
OSHA Occupational Exposure Limits:	TWA 0.05 mg/m <sup>3</sup>	Table Z-1 Limits for Air Contaminants
USA. OSHA:	TWA 0.05 ppm	Table Z-1 Limits for Air Contaminants 1910.1000
USA. ACGIH	STEL 0.6 mg/m <sup>3</sup>	Threshold Limit Values (TLV)

**Biological limit values:** No further relevant information available.

### **8.2 Exposure controls:**

#### **8.2.1 Appropriate engineering controls:**

Avoid contact with skin, eyes, and clothing.  
Wash hands before breaks and immediately after handling the product.

#### **8.2.2 Individual protection measures:**

##### **Eye/face protection:**

Face shield and safety glasses.  
Use equipment for eye protection tested and approved under the appropriate government standards such as NIOSH (US) OR EN 166 (EU).

##### **Skin protection:**

Handle with gloves.  
Gloves must be inspected prior to use.  
Use proper glove removal techniques (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.

Full contact  
Material: Nitrile rubber.  
Minimum layer thickness: 0.11 mm.  
Break through time: 480 min.  
Material tested: Dermatril® (KCL 740 / Aldrich Z677272, Size M)  
Data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300,  
email sales @kcl.de, test method: EN374

If used in solution, or mixed with other substances, and under conditions which differ from EN374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

**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:**

Where risk assessment shows air-purifying respirators are appropriate, use a full-face particle respirator type N100 (US) for type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

**8.2.3 Environmental exposure controls:**

Prevent further leakage or spillage if safe to do so.  
Do not let product enter drains.  
Discharge into the environment must be avoided.

## **Section 9: Physical and Chemical Properties**

**9.1 Information on basic physical and chemical properties:**

**Physical State:** Solid

**Appearance:** pale yellow crystalline

**Odor:** odorless

**pH:** N/A

**Vapor Pressure:** N/A

**Vapor Density:** N/A

**Evaporation Rate:** N/A

**Viscosity:** N/A

**Boiling Point:** N/A

**Freezing/Melting Point:** N/A

**Auto-ignition Temperature:** N/A

**Flash Point:** N/A

**Decomposition Temperature:** N/A

**Explosion Limits**

Lower: N/A

Upper: N/A

**Solubility in water:** Insoluble

**Specific Gravity/Density:** N/A

**Molecular Formula:** N<sub>2</sub>O<sub>8</sub>U·6H<sub>2</sub>O

**Molecular Weight:** 502.1

**Oxidizing properties:** The substance is classified as oxidizing with the category 2.

N/A = Not available

**9.2 Other information:** No further relevant information available.

## **Section 10: Stability and Reactivity**

**10.1 Reactivity:** No data available.

**10.2 Chemical Stability:** Stable under recommended storage conditions.

**10.3 Possibility of Hazardous Reactions:** No data available.

**10.4 Conditions to avoid:** No data available.

**10.5 Incompatible materials:** Strong oxidizing agents.

**10.6 Hazardous decomposition products:** In event of fire, see Section 5.

## **Section 11: Toxicological Information**

**Information on the likely routes of exposure:**

**11.1 Information on toxicological effects:**

**A. Acute toxicity:**

No data available.

Demal: No data available.

LD50 Intraperitoneal – Rat – 135 mg/g

LD50 Subcutaneous – Chicken – 299 mg/kg

Remarks:

Lungs, Thorax, or Respiration: Structural or functional change in trachea or bronchi.

Liver: Other changes.

Kidney, Ureter, Bladder: Other changes.

**B. Skin corrosion/irritation:**

No data available.

**C. Serious eye damage/irritation:**

No data available.

**D. Respiratory or skin sensitization:**

No data available.

**E. Germ cell mutagenicity:**

No data available.

**F. Carcinogenicity:**

Contains a radioactive isotope which may produce cancer and genetic mutation.

**IARC:** 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.

**NTP:** No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

**OSHA:** No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

**G. Reproductive toxicity:**

No data available.

**H. STOT-single exposure:**

No data available.

**I.. STOT-repeated exposure:**

May cause damage to organs through prolonged or repeated exposure.  
No further relevant information available.

**J. Aspiration hazard:**

No data available.

**K. Additional information:**

RTECS: YR3850000

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Kidney injury may occur.

Liver injury may occur.

Damage to the lungs may occur.

Blood disorders may occur.

Symptoms may be delayed.

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

**12.1 Toxicity:** No data available.

**12.2 Persistence and degradability:** Biodegradability Result: Not readily biodegradable.

**12.3 Bio-accumulative potential:** No data available.

**12.4 Mobility in soil:** No data available.

**12.5 Results of PBT and vPvB assessment:**

PBT/vPvB assessment not available as chemical safety assessment not required / not conducted.

**12.6 Other adverse effects:**

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.  
Toxic to aquatic life with long lasting effect.

## ***Section 13: Disposal Considerations***

**13.1 Waste treatment methods:**

**Product:**

Burn in a chemical incinerator equipped with an afterburner and scrubber, but exert extra care in igniting as this material is an oxidizer capable of intensifying a fire. 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 after-burner and scrubber.



**Contaminated packaging:** Dispose of as unused product.

## **Section 14: Transport Information**

### **US DOT Hazard Classes:**

Classification of substances with multiple hazards must be determined in accordance with the criteria presented in the U.S. Department of Transportation (D.O.T.) Code of Federal Regulations (49 CFR Parts 100-185), or the International Air Transportation Association (IATA). Due to the various quantities/combinations of materials potentially being shipped at one time, the information as to Proper Shipping Name, Hazard Class, UN/ID number, Packing Group, and Special Information must be determined based on the characteristics of the specific shipment.

Shipping Name: Radioactive material, excepted package – limited quantity of material  
UN#: 2910  
Hazard Class: 7  
Packing Group: None

Shipping Name: Nitrates, inorganic, n.o.s.  
UN#: 1477  
Class: 5.1  
Packing Group: II  
Hazard Label: Oxidizer  
PIH: Not PIH

### **IATA (for international shipments):**

Shipping Name: Radioactive material, excepted package – limited quantity of material  
IATA UN#: 2910  
Hazard Class: 7

Shipping Name: Nitrates, inorganic, n.o.s.  
IATA UN#: 1477  
Hazard Class 5.1  
Packing Group: II

## **Section 15: Regulatory Information**

### **15.1 Safety, health and environmental regulations/ legislation specific for the substance or mixture:**

#### **U.S. Government Regulations:**

Indication of danger: Oxidizing; Highly Toxic;

Risk Statements: Contact with combustible material may cause fire.

Very toxic if swallowed.

Irritating to respiratory system and skin.

Risk of serious damage to eyes.

There is limited evidence of a carcinogenic effect.

#### **SARA Listed:**

#### **SARA 302 Components:**

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

**SARA 313 Components:**

This material does not contain any chemical components with known CAS numbers that exceed the threshold (DeMinimis) reporting levels established by SARA Title III, Section 313.

**SARA 311/312 Hazards:**

Reactivity Hazard, Acute Health Hazard, Chronic Health Hazard.

Note that anhydrous uranyl nitrate, CAS# 10102-06-4, has an RQ of 100 under CERCLA.

**State Right to Know Components:**

CAS# 13520-83-7 is listed on the Massachusetts, New Jersey, and Pennsylvania Right-to-Know lists with a revision date of 1994-04-01.

**California No Significant Risk Level:****California Prop. 65:**

This product does not contain any chemicals known to the State of California to cause cancer, birth defects, or any other reproductive harm.

**Canada**

This product has been classified in accordance with the hazard criteria of 10th the CPR, and the MSDS contains all the information required by the CPR.

**DSL/NDSL:** CAS# 13520-83-7 is not on the DSL List or the NDSL List.

**WHMIS:** C, D2B

**15.2 Chemical Safety Assessment:** A Chemical Safety Assessment has not been carried out.

Date of Preparation: April 22, 2019.

**Abbreviations and acronyms**

IMDG: International Maritime Code for Dangerous Goods

DOT: US Department of Transportation

CMRG: Chemical Manufacturer's Recommended Guidelines

IATA: International Air Transport Association

ACGIH: American Conference of Governmental Industrial Hygienists

AIHA: American Industrial Hygiene Association

EINECS: European Inventory of Existing Commercial Chemical Substances

ELINCS: European List of Notified Chemical Substances

CAS: Chemical Abstracts Service (division of the American Chemical Society)

NFPA: National Fire Protection Association (USA)

HMIS: Hazardous Materials Identification System (USA)

LC50: Lethal concentration, 50 percent

LD50: Lethal dose, 50 percent

PBT: Persistent, Bio-accumulative and Toxicological

vPvB: very Persistent and very Bio-accumulative

NIOSH: National Institute for Occupational Safety

OSHA: Occupational Safety Health

ATE: Acute Toxicity Estimates

TLV: Threshold Limit Value

PEL: Permissible Exposure Limit

REL: Recommended Exposure Limit

STEL: Short Term Exposure Limit

CEIL: Ceiling

TSCA: Toxic Substances Control Act (USA)

DSL: Domestic Substances List (Canada)

PICCS: Philippine Inventory of Chemicals and Chemical Substances

ENCS: Existing and New Chemical Substances (Japan)

AICS: Australian Inventory of Chemical Substances

## **Section 16: Other Information**

### **Disclaimer of Liability:**

Caution! Do not use SPI Supplies products or materials in applications involving implantation within the body; direct or indirect contact with the blood pathway; contact with bone, tissue, tissue fluid, or blood; or prolonged contact with mucous membranes. Products offered by SPI Supplies are not designed or manufactured for use in implantation in the human body or in contact with internal body fluids or tissues. SPI Supplies will not provide to customers making devices for such applications any notice, certification, or information necessary for such medical device use required by US FDA (Food and Drug Administration) regulation or any other statute. SPI Supplies and Structure Probe, Inc. make no representation, promise, express warranty or implied warranty concerning the suitability of these materials for use in implantation in the human body or in contact with internal body tissues of fluids.

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