

SPI Supplies Division

Structure Probe, Inc.

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Manufacturer's CAGE: 1P573

Safety Data Sheet

Date Effective: May 24, 2021

SPI Catalog #'s 02545-AA, 02545-AB

SPI-Chem™ Uranyl Formate (Depleted Uranium),

Section 1.1: Identification

Chemical Name/Synonyms Uranyl Formate Mono Hydrate

Product or Trade Name SPI-Chem™ Uranyl Formate (Depleted Uranium),

CAS #'s 16984-59-1

Chemical Formula..... $\text{UO}_2(\text{HCO}_2)_2 \cdot \text{H}_2\text{O}$

Section 1.2: Relevant Uses/Restrictions

Electron dense uranyl based stain for 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)

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:

H300 + H330	Fatal if swallowed or if inhaled
H373	May cause damage to organs through prolonged or repeated exposure
H411	Toxic to aquatic life with long lasting effects

Precautionary statements:

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
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
P391	Collect spillage
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P405	Store locked up
P501	Dispose of content/ container to an approved waste disposal plant

2.3 Other Hazards:

Radioactive

Hazardous Material Information System USA

Health	3
Fire Hazard	0
Reactivity	0
Personal Protection	

NFPA Rating (estimated)

Health	4
Flammability	0
Reactivity	0

Section 3: Composition

3.1 Substances:

Formula: $\text{UO}_2(\text{HCO}_2)_2 \cdot \text{H}_2\text{O}$

Molecular Weight: 378.08 g/mol

CAS No.: 16984-59-1

EC-No.: 241-063-6

Component Classification:

Acute Toxicity, Oral, Category 2, H300

Acute Toxicity, Inhalation, Category 3, H330

STOT RE: Category 2, H373

Aquatic Acute, Category 2, H401

Aquatic Chronic, Category 2, H411

Section 4: First Aid Measures

4.1 Description of first aid measures:

General information:

Consult a physician.

Show this data sheet to the doctor in attendance.

Move out of the dangerous area.

Inhalation:

If breathed in, move person into fresh air.

If not breathing, give artificial respiration.

Consult a physician

In case of unconsciousness, place patient stably in side position for transportation.

Skin Contact:

After skin contact, immediately wash with water and soap and rinse thoroughly.

Eye Contact:

After eye contact, rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.

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 further relevant information available.

Section 5: Fire Fighting Measures

5.1 Extinguishing media:

CO₂, alcohol-resistant foam, dry chemical, or water spray.

5.2 Special hazards arising from the substance or mixture:

Carbon oxides, Uranium oxides.

5.3 Hazardous combustion products:

Carbon monoxide, Carbon dioxide, Uranium oxides, Formic acid.

5.4 Advice for firefighters:

Special protective equipment and precautions for firefighters:

Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

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 into suitable closed containers for disposal.
Pick up and arrange disposal without creating dust.

6.4 Reference to other sections:

For disposal see Section 13.

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.
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.

7.3 Specific end uses:

Electron dense uranyl based stain for 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:

Uranyl Formate Mono Hydrate:

TWA 0.2 mg/m³ USA. ACGIH Threshold Limit Values (TLV)
Remarks: Confirmed human carcinogen

TWA 0.05 mg/m³ USA. Occupational Exposure Limits
(OSHA) – Table Z-1 Limits for Air Contaminants

TWA 0.05 ppm
USA. OSHA – Table Z-1 Limits for Air Contaminants – 1910.1000

STEL 0.6 mg/m³ USA. ACGIH Threshold Limit Values (TLV)
Confirmed Human Carcinogen

TWA 0.05 mg/m³ USA. Occupational Exposure Limits
(OSHA) – Table Z-1 Limits for Air Contaminants

TWA 0.05 mg/m³ USA. OSHA – Table Z-1 Limits for Air Contaminants – 1910.1000

TWA 0.05 mg/m³ USA. NIOSH Recommended Exposure Limits
Potential Occupational Carcinogen (See Appendix A)

Biological limit values: No data 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 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 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.

Glove type:

Full contact.

Material: Nitrile rubber.

Minimum layer thickness: 0.44 mm.

Break through tie: 480 min.

Material tested: Dermatril® (KCL 740 / Aldrich Z677272, size M)

Splash Contact

Material: Nitrile rubber

Minimum layer thickness: 0.11 mm

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 EN 374, 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) or 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).

Control of Environmental Exposure:

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

Section 9: Physical and Chemical Properties

9.1 Information on basic physical and chemical properties:

Appearance:

Form: Crystalline

Color: Yellow

Odor: No data available

Odor threshold: No data available

pH: No data available

Melting point/Freezing point: No data available

Boiling point/Boiling point range: No data available

Flash Point: No data available

Evaporation rate: No data available

Flammability (solid, gas): No data available

Upper/lower flammability or explosive limits: No data available

Vapor Pressure: No data available

Vapor density: No data available

Relative density: 2.890 g/cm³

Solubility: No data available

Partition coefficient (n-octanol/water): No data available

Auto-ignition temperature: No data available

Decomposition temperature: 275 °C (527 °F)

Viscosity: No data available

Explosive properties: No data available

Oxidizing Properties: No data available

9.2 Other information:

No data 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:

Other decomposition products: No data available.

In the 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:

LD50 Oral – rat 204 mg/kg

Remarks:

Behavioral: Tremor.

Skin and Appendages: Other: Hair.

Nutritional and Gross Metabolic: Changes in: Body temperature decrease.

Dermal: No data available.

LD50 Subcutaneous – rat – 8.300 mg/kg

Remarks:

Behavioral: Tremor.

Skin and appendages: Other: Hair

Nutritional and Gross Metabolic: Changes in: Body temperature decrease.

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.

J. Aspiration hazard:

No data available.

Additional Information:

RTECS: Not available.

Conjunctivitis.

Blood disorders, Symptoms may be delayed.

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

Section 12: Ecological Information

12.1 Toxicity: No data available.

12.2 Persistence and degradability:

No data available.

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 effects.

No further data available.

Section 13: Disposal Considerations

13.1 Waste treatment methods:

Product:

Offer surplus and non-recyclable solutions to a licensed disposal company.
Contact a licensed 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: Transport Information

14.1 UN number: UN 2910

14.2 UN proper shipping name: Radioactive material, excepted package – limited quantity of material

14.3 Transport hazard class(es): Class 7

14.4 Packing Group: none

Section 15: Regulatory Information

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

U.S. Government Regulations:

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 (De Minimis) reporting levels established by SARA Title III, Section 313.

Massachusetts Right To Know Components

CAS No. 16984-59-1 Uranyl Formate Mono Hydrate

Pennsylvania Right To Know Components

CAS No. 16984-59-1 Uranyl Formate Mono Hydrate

New Jersey Right To Know Components

CAS No. 16984-59-1 Uranyl Formate Mono Hydrate

California Prop. 65 Components

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

15.2 Chemical Safety Assessment:

Date of Preparation: 24 May 2021

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
IECSC: Inventory of Existing Chemical Substances in China
KECL: Korea Existing Chemicals List

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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levels could have substantially different properties.