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Safety Data Sheet

Date Effective: November 10, 2015

SPI02546-AA, 02546-AB
SPI-Chem™ Uranyl Nitrate Hexa-Hydrate
(Depleted Uranium)

Section 1: Identification

Chemical Name/Synonyms..... Uranyl Nitrate Hexa-Hydrate

Chemical family..... radioactive materials

Emergencies
Contacting CHEMTREC:
24 Hour Emergency Use Only #'s...
Within USA and Canada: 1-800-424-9300
Outside USA and Canada: +1 703-741-5970 (collect calls accepted)

Product or Trade Name..... Uranyl Nitrate Hexa-Hydrate

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

Chemical Formula..... $N_2O_8U \cdot 6H_2O$
RTECS #: YR3850000

Emergency Overview

OSHA Hazards
Highly toxic by inhalation, Highly toxic by ingestion, Carcinogen

Target Organs
Kidney, Liver, Lungs, Brain.

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Oxidizing solids (Category2)
Acute toxicity, Oral (Category 2)
Acute toxicity, Inhalation (Category 2)
Specific target organ toxicity - repeated exposure (Category 2)
Acute aquatic toxicity (Category 2)
Chronic aquatic toxicity (Category 2)

GHS Label elements, including precautionary statements
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
H411: Toxic to aquatic life with long lasting effects.

Precautionary Statements:
P102: Keep out of reach of children
P210: Keep away from heat.
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+{378: 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 disposal plant.

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

Hazardous Material Information System USA
- Health..... 3
- Fire Hazard..... 0
- Reactivity..... 3
- Personal Protection.....

NFPA Rating (estimated)
- Health..... 3
- Flammability..... 0
- Reactivity..... 3
- Special Hazard.....1 (OX)

Section 2: Composition

Component Name	CAS #	%	EC#
Uranyl Nitrate Hexahydrate	13520-83-7	99.9	233-266-3

Section 3: Hazard Identification

Emergency overview: Oxidizing. Highly Toxic (USA); Very Toxic (EU).

Appearance: Pale yellow crystalline solid
Flash Point: n/a

Warning! Fire hazard in contact with combustible materials.

Target Organs: Kidneys, Liver

Potential Health Effects

Eye: Risk of serious damage to eyes.

Skin: Irritating to the skin.

Ingestion: Very toxic if swallowed.

Inhalation: Irritating to the respiratory system. Toxic by inhalation.

Chronic: Danger of cumulative effects.

Additional toxicological information is available in Section 11.

Section 4: First Aid Measures

General Advice:
Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

Eyes: In case of eye contact, immediately flush with copious amounts of water for at least 15 minutes, holding the eyelids open. Seek immediate medical attention.

Skin: In case of skin contact, wash with soap and flush with copious amounts of water for at least 15 minutes. Remove contaminated clothing and shoes. Take victim immediately to hospital. Consult a physician.

Ingestion: Never give anything by mouth to an unconscious person. If swallowed, and the victim is conscious, wash out mouth with water. Seek immediate medical attention.

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. Seek immediate medical attention.

Most important symptoms an effects, both acute and delayed: The most important known symptoms and effects are described in the labeling and/or in Section 11.

Indication of any immediate medical attention and special treatment needed: No data available.

Section 5: Fire Fighting Measures

General Information:
Wear self-contained breathing apparatus and protective clothing to prevent skin and eye contact. Emits toxic fumes under fire conditions. Contact with combustible material may cause fire. May react explosively with cellulose and certain organic solvents.

Extinguishing Media:
Water spray, carbon dioxide, dry chemical powder or appropriate foam.

Combustion by-products: Nitrogen oxides (Nox), Uranium oxides

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

Section 6: Accidental Release Measures

General Information:
Wear respiratory protection. Avoid dust formation. Avoid breathing vapors, mist or gas. Ensure adequate ventilation.

Evacuate personnel to a safe area. Avoid breathing dust. Handle as a radioactive spill.

Spills/Leaks:
For personal protection, see Section 8: Face shield with safety glasses, Nitrile gloves (0.11mm minimum), complete suite protecting against chemicals, respirator where needed.

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

Sweep up by wetbrushing, place in a bag, and hold for waste disposal. Avoid raising dust. Store in suitable, closed container for disposal. After material pickup is completed, ventilate area and wash the spill site.

Section 7: Handling and Storage

Handling:
Do not breathe dust. Avoid all contact with eyes, skin or clothing. Avoid repeated or prolonged exposure.

Avoid formation of dust a aerosols. Provide appropriate exhaust ventilation at places where dist is formed. Keep away from heat and sources of ignition – No smoking.

Storage:
Store in cool, dry area in tightly closed containers. Hygroscopic. Store away from combustible materials, reducing agents, cellulose, or organic solvents.

Section 8: Exposure Controls and Personal Protection

Engineering Controls: Safety shower and eye wash station must be available to the work area. Use only in a chemical fume hood. Avoid contact wit skin, eyes and clothing. Wash hands before breaks and immediately after handling the product.

Exposure Limits:
USA MSHA Standard-air TWA = 0.2 mg(U)/m^3
USA OSHA PEL 8hr TWA = 0.05 mg(U)/m^3

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

STEL 0.6 mg/m^3 USA, ACGIH Threshold Limit Values (TLV)

Confirmed human carcinogen.

Personal Protective
Eyes: Ch Equipment
chemical splash goggles and face shield approved under appropriate government standards, such as NIOSH (US) or EN 166 (EU).

Skin: Chemical-resistant gloves, other protective clothing such as long sleeves or a lab coat should be worn to prevent skin contact. Gloves must be inspected before use, and proper glove removal techniques followed to avoid touching the glove's outer surface. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands. Glove material recommended: nitrile rubber with minimum layer thickness of 0.11 mm, with a break through time of 480 minutes, test method: EN374. If used in solution, or mixed with other substances, and used under conditions which differ from EN374, the proper gloves to use must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use.

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.

Respirators: Use a NIOSH/MSHA or European Standard EN 149 approved respirator. If risk assessment indicates use of air-purifying respirators are needed, use a full-face respirator with type N100 (US) or type P3 (EN143) respirator cartridges as backup to engineering controls.

General Hygiene Measures: Wash thoroughly after handling.

Section 9: 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
Autoignition 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: $N_2O_8U{\cdot}6H_2O$
Molecular Weight: 502.1
Oxidizing properties: The substance is classified as oxidizing with the category 2.

N/A = Not available

Section 10: Stability and Reactivity

Chemical Stability: Stable

Conditions to Avoid: Moisture

Incompatibility with Other Materials: Avoid contact with combustible materials, cellulose, reducing agents, organic solvents, strong oxidizing agents.

Hazardous Decomposition of Products: Oxides of uranium, Nitrogen oxides

Hazardous Polymerization: Will not occur.

Section 11: Toxicological Information

ROUTE OF EXPOSURE
Skin Contact: Causes skin irritation.
Skin Absorption: May be harmful if absorbed through the skin.
Eye Contact: Causes severe eye irritation.
Inhalation: Material is irritating to mucous membranes and upper respiratory tract. May be harmful if inhaled.
Ingestion: May be fatal if swallowed.

TARGET ORGAN(S) OR SYSTEM(S)
Kidneys. Liver. Lungs. Brain.

SIGNS AND SYMPTOMS OF EXPOSURE
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated. Exposure can cause: Damage to the kidneys. Damage to the liver. Damage to the lungs. Blood effects. Symptoms may be delayed.

TOXICITY DATA
LD50: Intraperitoneal Rat:135 MG/KG

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.

Acute toxicity: No data available.

Skin corrosion / irritation: No data available.

Serious eye damage / eye irritation: No data available.

Respiratory or skin sensitization: No data available.

Germ cell mutagenicity: No data available.

Reproductive toxicity: No data available.

Specific target organ toxicity – single exposure: No data available.

Specific target organ toxicity – repeated exposure: May cause damage to organs through prolonged or repeated exposure. No data available.

Aspiration hazard: No data available.

CARCINOGENICITY:

CHRONIC EXPOSURE - CARCINOGEN
Result: Contains a radioactive isotope which may produce cancer and genetic mutation.

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.

CHRONIC EXPOSURE - MUTAGEN
Species: Hamster
Dose: 180 MG/L
Cell Type: lung
Mutation test: Cytogenetic analysis

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

Toxicity: No data available.

Persistence and degradability: Biodegradability Result: Not readily biodegradable.

Bioaccumulative potential: No data available.

Mobility in soil: No data available.

Results of PBT and vPvB assessment: PBT/vPvB assessment not available as chemical safety assessment not required/ not conducted.

Other adverse effects: An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

Substance is toxic to aquatic organisms. May cause long-term adverse effects in the aquatic environment. No further data is available

Section 13: Disposal Considerations

Product: Dispose of spilled material as a radioactive waste. 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. Dispose of in accordance with all local, state and federal regulations on the disposal of radioactive waste.

Contaminated packaging: Dispose of as unused product.

Section 14: Transport Information

US DOT Hazard Classes:

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

United States:

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.

European/International Regulations:
European Labeling in Accordance with EC Directives

Hazard Symbols: T + R N
Very toxic. Radioactive. Dangerous for the environment.
Risk Phrases:
R26/28 Very toxic by inhalation and if swallowed.
R33 Danger of cumulative effects.
R51/53 Toxic to aquatic organisms; May cause long-term adverse effects in the aquatic environment.

Safety Phrases:
S20/21 When using, do not eat, drink, or smoke.
S45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
S61 Avoid release to the environment. Refer to special instructions/safety data sheets.

Canada

This product has been classified in accordance with the hazard criteria of 9the 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

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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