

**From:** virginia.kay [REDACTED]  
**Sent:** Wednesday, November 03, 2010 1:13 PM  
**To:** Dimarzio, John A.  
**Cc:** sachiko-w.mcalhany@nnsa.srs.gov  
**Subject:** Fw: Questions Regarding DUO2 and DUNH Shipments

**Attachments:** SPI Supplies - MSDS Safety - SPI-Chem Uranyl Nitrate Hexahydrate.htm; URANYL NITRATE, HEXAHYDRATE, SOLUTION CAMEO Chemicals NOAA.htm; URANYL NITRATE HEXAHYDRATE 13520-83-7.htm; DCS02-FQJ-DU-SPE-W-00011-1 (Final for Signature November 01 2010) JP 3 Nov.doc; 1474\_001.pdf

----- Forwarded by Virginia Kay [REDACTED] on 11/03/2010 01:12 PM -----

From: "Pope, James M." [REDACTED]  
To: <virginia.kay [REDACTED]>  
Cc: "Karchaske, Janelle" [REDACTED]  
Date: 11/03/2010 12:54 PM  
Subject: FW: Questions Regarding DUO2 and DUNH Shipments

Please see [MOX Services'](#) replies that can be provided at this time. I've included Carl Mazzola's information here, so it's unnecessary to forward his e-mail.

Thanks,  
Jim Pope

**From:** Gorden, Milton E.  
**Sent:** Monday, October 25, 2010 5:25 PM  
**To:** Eichner, John M.  
**Cc:** Dimarzio, John A.  
**Subject:** questions regarding DUO2 and DUNH shipments

I have several questions regarding the materials to be shipped from AREVA to SRS.

1. Why was 72 drums per shipment assumed? [After discussions with the supplier/shipper of the DUO2 & DUNH \(AREVA-NP Richland, WA\), this was based on \(1\) the size of the flatbed they identified \(48 ft\); \(2\) their planned degree of packing of the drums; and, \(3\) consideration of the total drums expected to be shipped, and spreading the number of drums about equally per shipment; so, all the shipments had nominally 72. Was there a weight limitation to prevent 80 drums per shipment? No.](#)
2. Are the drums of DUO2 and DUNH going to be intermingled when shipped, or do they occur in separate shipments? This question is raised because of the apparent reactivity of the DUNH. [We didn't differentiate in the Request For Proposal from the supplier \(AREVA-NP\); could be either and we deferred to AREVA-NP based upon their knowledge of transportation regulations for the DUO2 and DUNH.](#)
3. I would like additional information regarding the DUNH. [The MOX Services Specification is attached. Are there any special handling procedures for this material? At this time MOX Services has not developed the handling / operations procedures since the material does not arrive until ~2015. Please see the attached information provided by Carl Mazzola. Is it in a powder form? No, liquid...see the attached Spec. Should I assume same release fractions as those for DUF6? See the attached information. Impacts from UNH are probably somewhat conservative relative to DUNH \(depleted uranyl nitrate hexahydrate\).](#)
4. Depending on the chemical characteristics of DUNH, I may need to add a discussion of chemical impacts during transportation, and information in response to the above would be helpful in creating one. Is there other NEPA documentation that addresses DUNH that can be used as a source of information? [Per Carl Mazzola, he does not know of NEPA documentation associated with the use of this chemical; Carl suggests searching work done at Y-12, Paducah,](#)

and Portsmouth.

**Milton E. Gorden** | SAIC

Senior Engineer

Energy, Environment & Infrastructure Solutions

[Redacted]

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[Redacted]

**SPI Supplies Division  
Structure Probe, Inc.**

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WWW: <http://www.2spi.com>

Manufacturer's CAGE: 1P573



# Material Safety Data Sheet

**[SPI #02546-AB SPI-Chem™ Uranyl Nitrate Hexahydrate](#)**

## Section 01 Identification

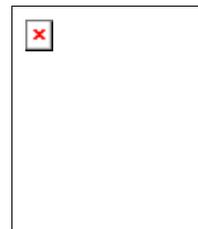
Date Effective..... March 3, 2010  
(most recent revision)

Chemical Name/Synonyms... Uranyl Nitrate Hexahydrate

Emergencies  
Contacting CHEMTREC:

24 Hour Emergency Use Only #'s...  
Worldwide phone: 1-(703)-527-3887  
Worldwide FAX: 1-(703)-741-6090  
Toll-free phone: 1-(800)-424-9300 USA only

Product or Trade Name.... SPI #02546-AB Uranyl nitrate hexahydrate  
Synonyms: Uranyl(VI)nitrate hexahydrate; Dinitratodioxouranium hexahydrate;  
Uranyl dinitrate hexahydrate; Uranium, bis(nitrato-O)dioxo-,hexahydrate(T-4)-(9CI)  
Chemical Family: Radioactive material  
Chemical Formula:  $N_2O_8U \cdot 6H_2O$   
RTECS #: YR3850000



<b>Hazardous Material Information System USA</b>	<b>Health</b>	<b>3</b>	<b>National Fire Protection Association USA</b>	
	<b>Fire Hazard</b>	<b>0</b>		
	<b>Reactivity</b>	<b>0</b>		
	<b>Personal Protection</b>	<b>3</b>		

**NFPA Rating:**  
(estimated) Health: 3; Flammability: 0 ; Reactivity: 3

## Section 2 Composition

Component Name	CAS #	%	EINECS/ELINCS
Uranyl Nitrate Hexahydrate	13520-83-7	99.9	n/a

---

### 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

**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. If irritation develops or persists, seek medical attention.

**Ingestion:** If swallowed, and the victim is conscious, wash out mouth with water. Seek immediate medical attention.

**Inhalation:** If inhaled, remove to fresh air. If breathing is difficult, seek immediate medical attention.

---

### 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.

---

**Section 6: Accidental Release Measures****General Information:**

Evacuate area. Handle as a radioactive spill.

**Spills/Leaks:**

Wear self-contained breathing apparatus, rubber boots and heavy rubber gloves. Sweep up, place in a bag, and hold for waste disposal. Avoid raising dust. 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.

**Storage:**

Store in cool, dry area in tightly closed containers. 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.

**Exposure Limits:**

USA MSHA	Standard-air	TWA = 0.2 mg(U)/m <sup>3</sup>
USA OSHA	PEL 8hr	TWA = 0.05 mg(U)/m <sup>3</sup>

**Personal Protective Equipment**

**Eyes:** Chemical splash goggles

**Skin:** Chemical-resistant gloves, other protective clothing such as long sleeves or a lab coat should be worn to prevent skin contact.

**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

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

**Hazardous Decomposition of Products:** Oxides of uranium, Nitrogen oxides

**Hazardous Polymerization:** Will not occur.

---

## Section 11: Toxicological Information

**RTECS#:** SD4431500

**LD<sub>50</sub>/LC<sub>50</sub> Information:**

    LD509            Mouse, intravenous            63 mg/kg

**Carcinogenicity:**

CAS# 4197-25-5 is not listed by ACGIH, IARC, NTP, OR California Proposition 65.

**Teratogenicity:** Not known

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**Reproductive Effects:** Not known

**Neurotoxicity:** Not known

**Mutagenicity:** Not known

**Other Studies:** Not known

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## Section 12: Ecological Information

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

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## Section 13: Disposal Considerations

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

---

## Section 14: Transport Information

### US DOT Hazard Classes:

Shipping Name: Radioactive material, excepted package - limited quantity of materi  
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 materi  
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:** NO

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

**California No Significant Risk Level:**

**California Prop. 65:** This product is known to the state of California to cause cancer.

**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 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.

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**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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 [To Place an Order or Request a Quote](#)

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Tuesday November 02, 2010

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# URANYL NITRATE, HEXAHYDRATE, SOLUTION

[Chemical Identifiers](#) | [Hazards](#) | [Response Recommendations](#) | [Physical Properties](#) | [Regulatory Information](#) | [Alternate Chemical Names](#)

## Chemical Identifiers

[What is this information?](#) 

**UN/NA Number** - The United Nations-North America number (also called UN number or DOT number). 4-digit number identifying an individual chemical or group of chemicals with similar characteristics. Required on shipping papers; often shown on placards or labels. This numbering system was developed by the U.S. Department of Transportation, and then became the UN standard system for classifying hazardous materials.

**CAS Number** - Chemical Abstracts Service registry number. Unique identification number assigned to this chemical by the American Chemical Society.

**CHRIS Code** - 3-letter code used by the U.S. Coast Guard to identify individual chemicals included in its [CHRIS \(Chemical Hazards Response Information System\) manual](#).

**DOT Hazard Label** - U.S. Department of Transportation hazard warning label for the chemical (such as flammable liquid or corrosive). This label must be displayed on shipped packages, railroad tank cars, and tank

trucks according to specifications described in 49 CFR 172.

**NFPA 704** - Text description of the diamond-shaped placard, which contains codes indicating the level of the chemical's health, flammability, and reactivity hazards, along with special hazards such as water- and air-reactivity. (The NFPA 704 diamond is also shown at the top of the datasheet.) See [a guide to the NFPA diamond](#).

**General Description** - Brief description of the chemical's general appearance, behavior, and hazardousness.

[List of data sources.](#)

UN/NA Number	CAS Number	CHRIS Code	DOT Hazard Label
• <a href="#">2980</a>	• 13520-83-7	none	• RADIOACTIVE • CORROSIVE

NFPA 704: data unavailable

General Description

Acidic solution in water of uranyl nitrate, a radioactive yellow crystalline solid. Mildly chemically toxic. Contains nitric acid. Noncombustible, but will accelerate the burning of other combustible materials if concentrated or if the water evaporates. Large quantities may explode if exposed to fire. Produces toxic oxides of nitrogen if involved in fire. Radioactive materials emit certain rays which can be detected only by instruments. Unirradiated uranium is only mildly radioactive. Minimal radiation hazard during transportation. No protective shielding is required. Non-fissile (natural or depleted) uranium, containing not more than 1.0% <sup>u-235</sup>, cannot sustain a nuclear chain reaction.

## Hazards

[What is this information?](#)



**Reactivity Alerts** - Special alerts if the chemical is especially reactive (see [list of reactivity alerts](#)).

**Air & Water Reactions** - Special alerts if the chemical reacts with air, water, or moisture.

**Fire Hazard** - Description of the chemical's fire hazards (such as flammability, explosion risk, or byproducts that may evolve if the chemical is burned).

**Health Hazard** - Description of the chemical's health hazards (such as toxicity, flammability, or corrosivity).

**Reactivity Profile** - Description of the chemical's potential reactivity with other chemicals, air, and water. Also includes any other intrinsic reactive hazards (such as polymerizable or peroxidizable).

**Reactive Groups** - List of reactive groups that the chemical is assigned to, based on its known chemistry. Reactive groups are categories of chemicals that react in similar ways because their chemical structures are similar. Reactive groups are used to predict reactivity when you add a chemical to MyChemicals. [Read more about reactive groups.](#)

[List of data sources.](#)

Reactivity Alerts

- Strong Oxidizing Agent
- Radioactive Material

Air & Water Reactions

Dissolves in water forming a weak solution of nitric acid, the reaction is not hazardous.

### Fire Hazard

Some of these materials may burn, but most do not ignite readily. Uranium and Thorium metal cuttings may ignite spontaneously if exposed to air, refer to GUIDE 136 below. Nitrates are oxidizers and may ignite other combustibles, refer to GUIDE 141 below.

GUIDE 136: Extremely flammable; will ignite itself if exposed to air. Burns rapidly, releasing dense, white, irritating fumes. Substance may be transported in a molten form. May re-ignite after fire is extinguished. Corrosive substances in contact with metals may produce flammable hydrogen gas. Containers may explode when heated.

GUIDE 141: These substances will accelerate burning when involved in a fire. May explode from heat or contamination. Some may burn rapidly. Some will react explosively with hydrocarbons (fuels). May ignite combustibles (wood, paper, oil, clothing, etc.). Containers may explode when heated. Runoff may create fire or explosion hazard. (ERG, 2008)

### Health Hazard

Radiation presents minimal risk to transport workers, emergency response personnel and the public during transportation accidents. Packaging durability increases as potential hazard of radioactive content increases. Undamaged packages are safe. Contents of damaged packages may cause higher external radiation exposure, or both external and internal radiation exposure if contents are released. Low radiation hazard when material is inside container. If material is released from package or bulk container, hazard will vary from low to moderate. Level of hazard will depend on the type and amount of radioactivity, the kind of material it is in, and/or the surfaces it is on. Some material may be released from packages during accidents of moderate severity but risks to people are not great. Released radioactive materials or contaminated objects usually will be visible if packaging fails. Some exclusive use shipments of bulk and packaged materials will not have "RADIOACTIVE" labels. Placards, markings and shipping papers provide identification. Some packages may have a "RADIOACTIVE" label and a second hazard label. The second hazard is usually greater than the radiation hazard; so follow this GUIDE as well as the response GUIDE for the second hazard class label. Some radioactive materials cannot be detected by commonly available instruments. Runoff from control of cargo fire may cause low-level pollution. (ERG, 2008)

### Reactivity Profile

Mixtures of metal/nonmetal nitrates with alkyl esters may explode, owing to the formation of alkyl nitrates; mixtures a nitrate with phosphorus, tin (II) chloride, or other reducing agents may react explosively [Bretherick 1979. p. 108-109]. Dissolves in water forming a weak solution of nitric acid, the reaction is not hazardous. Belongs to the Following Reactive Group(s)

- [Inorganic Oxidizing Agents](#)
- [Water](#)

## Response Recommendations

[What is this information?](#) 

**Firefighting** - Response recommendations if the chemical is on fire (or near a fire).

**Non-Fire Response** - Response recommendations if the chemical isn't on fire (or near a fire).

**Protective Clothing** - Recommendations for protective gear and, in some cases, a table of breakthrough times for protective materials.

**First Aid** - Recommended first aid treatment for people exposed to the chemical.

[List of data sources.](#)

Firefighting

Contact the local, state, or Department Of Energy Radiological Response Team. Flood with water. Cool all affected containers with flooding quantities of water. Apply water from as far a distance as possible. (AAR, 2003)

#### Non-Fire Response

Contact the local, state, or Department Of Energy Radiological Response Team. Keep sparks, flames, and other sources of ignition away. Keep material out of water sources and sewers. Build dikes to contain flow as necessary. Land spill: Dig a pit, pond, lagoon, holding area to contain liquid or solid material. Dike surface flow using soil, sand bags, foamed polyurethane, or foamed concrete. Absorb bulk liquid with fly ash, cement powder, or commercial sorbents. Neutralize with agricultural lime (CaO), crushed limestone (CaCO<sub>3</sub>) or sodium bicarbonate (NaHCO<sub>3</sub>). Water spill: Neutralize with agricultural lime (CaO), crushed limestone (CaCO<sub>3</sub>), or sodium bicarbonate (NaHCO<sub>3</sub>). Adjust pH to neutral (pH=7). Use mechanical dredges or lifts to remove immobilized masses of pollutants and precipitates. (AAR, 2003)

#### Protective Clothing

Keep upwind. Avoid breathing dusts, and fumes from burning material. Wear appropriate chemical protective clothing. Wear positive pressure self-contained breathing apparatus. Do not handle broken packages unless wearing appropriate personal protective equipment. Wash away any material which may have contacted the body with copious amounts of water or soap and water. (AAR, 2003)

#### First Aid

Call 911 or emergency medical service. Medical problems take priority over radiological concerns. Use first aid treatment according to the nature of the injury. Do not delay care and transport of a seriously injured person. Give artificial respiration if victim is not breathing. Administer oxygen if breathing is difficult. In case of contact with substance, wipe from skin immediately; flush skin or eyes with running water for at least 20 minutes. Injured persons contaminated by contact with released material are not a serious hazard to health care personnel, equipment or facilities. Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves and prevent spread of contamination. (ERG, 2008)

## Physical Properties

[What is this information?](#)



This section contains physical properties, flammability limits, and toxic thresholds for this chemical (see [definitions of each property](#)). More property data is available for common chemicals.

[Guide to toxic levels of concern \(AEGLs, ERPGs, TEELs, and IDLH\).](#)

[List of data sources.](#)

Molecular Formula: 

- H<sub>2</sub>O.1
- 6N<sub>2</sub>O<sub>8</sub>U

Flash Point: data unavailable

Lower Explosive Limit: data unavailable

Upper Explosive Limit: data unavailable

Autoignition Temperature: data unavailable

Melting Point: data unavailable

Vapor Pressure: data unavailable

Vapor Density: data unavailable

Specific Gravity: data unavailable

Boiling Point: data unavailable

Molecular Weight: data unavailable

Water Solubility: data unavailable

AEGL: data unavailable

ERPG: data unavailable

**TEEL-1    TEEL-2    TEEL-3**

1.27 mg/m<sup>3</sup> 1.27 mg/m<sup>3</sup> 21.1 mg/m<sup>3</sup>

(SCAPA, 2008)

IDLH: 10.0 mg/m<sup>3</sup> As U (soluble compounds, as U); A potential human carcinogen. (NIOSH, 2003)

## Regulatory Information

[What is this information?](#)



**Regulatory Names** - Names under which this chemical is regulated under several U.S. federal laws: **CAA** (Clean Air Act of 1990), **CERCLA** (Comprehensive Environmental Response, Compensation, and Liability Act of 1980, also known as Superfund), **EPCRA** (Emergency Planning and Community Right-to-Know Act, also known as SARA Title III), and **RCRA** (Resource Conservation and Recovery Act of 1976).

**CAA RMP** - Indicates whether this chemical is regulated under Section 112(r) of the Clean Air Act, which lists about 100 toxic, flammable, or explosive hazardous substances. (Section 112(r) mandates the Risk Management Plan regulations.) For listed chemicals, the Threshold Quantity (from 40 CFR 68) is also shown. Facilities that use more than the threshold quantity of a listed chemical in a process are subject to the CAA accidental release prevention provisions.

**CERCLA** - Indicates whether this chemical is listed as a hazardous substance under CERCLA. For listed chemicals, the Reportable Quantity (from 40 CFR 302) is also shown. Facilities that spill more than the reportable quantity of a listed chemical must report it to federal, state, and local governments.

**EHS (EPCRA 302)** - Indicates whether this chemical is listed as an Extremely Hazardous Substance under Section 302 of EPCRA. For listed chemicals, the Threshold Planning Quantity (from 40 CFR 355) is also shown. Facilities that store more than the threshold quantity of an EHS chemical must meet the reporting, community right-to-know, and emergency planning requirements of EPCRA.

**TRI (EPCRA 313)** - Indicates whether this chemical is listed as a toxic chemical under Section 313 (Toxics Release Inventory) of EPCRA. Facilities that manufacture, store, or use significant amounts of Section 313 chemicals may be required to submit annual reports about any releases into the environment (see 40 CFR 372).

**RCRA Chemical Code** - 4-character identification code assigned to this substance under RCRA.

Regulatory Names: none

CAA RMP: Not a regulated chemical.

CERCLA: Not a regulated chemical.

EHS (EPCRA 302): Not a regulated chemical.

TRI (EPCRA 313): Not a regulated chemical.

RCRA Chemical Code: none

## Alternate Chemical Names

[What is this information?](#)



This section provides a listing of alternate names for this chemical, including trade names, synonyms, and foreign names.

- DINITRATODIOXOURANIUM HEXAHYDRATE
- NITRATE D'URANYLE, HEXAHYDRATÉ, EN SOLUTION (DOT FRENCH)
- NITRATO DE URANILO, HEXAHIDRATADO, EN SOLUCIÓN (DOT SPANISH)
- URANIUM (SOLUBLE COMPOUNDS, AS U)
- URANIUM DIOXIDE DINITRATE, HEXAHYDRATE

- URANIUM, BIS(NITRATO-O)DIOXO-, HEXAHYDRATE, (T-4)-
- URANIUM, DINITRATODIOXO-, HEXAHYDRATE
- URANYL DINITRATE HEXAHYDRATE
- URANYL NITRATE HEXAHYDRATE
- URANYL NITRATE HEXAHYDRATE SOLUTION

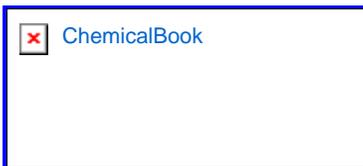
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Web site owner: [Office of Response and Restoration](#), [NOAA's Ocean Service](#), [National Oceanic and Atmospheric Administration](#).

US Government main portal: [USA.gov](#).

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URANYL NITRATE HEXAHYDRATE

[Chinese](#)
[ChemicalBook](#) >> [CAS DataBase List](#) >> URANYL NITRATE HEXAHYDRATE

# URANYL NITRATE HEXAHYDRATE

 URANYL NITRATE HEXAHYDRATE Structure  
[URANYL NITRATE HEXAHYDRATE](#)

**CAS No.** [13520-83-7](#)  
**Chemical Name:** **URANYL NITRATE  
HEXAHYDRATE**  
**Synonyms:** URANIUM NITRATE;URANIUM  
NITRATE,  
HEXAHYDRATE;URANYL  
DINITRATE  
HEXAHYDRATE;URANYL  
NITRATE  
HEXAHYDRATE;URANYL  
NITRATE HYDRATE;bis(nitrato)  
dioxo-  
uraniuhexahydrate;dinitratodioxo-  
uraniuhexahydrate;hexahydrate(t-4)-  
uraniu;Uranium,bis(nitrato)dioxo-  
,hexahydrate;Uranium,dinitratodioxo-  
,hexahydrate;uranyl nitrate,hexahydrate,s  
hexahydrate;bis(nitrato-O)  
dioxouranium;URANYL NITRATE  
HEXAHYDRATE, ACS;URANIUM  
(VI) DINITRATE OXIDE  
HEXAHYDRATE 99+%;URANYL  
NITRATE GR;Uranium nitrate  
hydrate;Uranium, bis(nitrato-.kappa.O)  
dioxo-, (T-4)-;Uranium, bis(nitrato-  
.kappa.O)dioxo-, hexahydrate, (T-4)-  
;URANYLNITRATE,HEXAHYDRATE  
**CBNumber:** CB4392622  
**Molecular  
Formula:** H12N2O14U  
**Formula Weight:** 502.13  
**MOL File:** [13520-83-7.mol](#)

## URANYL NITRATE HEXAHYDRATE Property

**mp :** 60,2°C  
**density :** 2,807 g/cm<sup>3</sup>  
**Stability::** Radioactive, but chemically stable. Strong oxidant. Hygroscopic. Incompatible with combustible materials, reducing agents. May react explosively with cellulose and certain organic solvents.

**CAS DataBase Reference:** [13520-83-7\(CAS DataBase Reference\)](#)

## Safety

**Hazard Codes :** [T+,R,N](#)  
**Risk Statements :** [26/28-33-51/53](#)  
**Safety Statements :** [20/21-45-61](#)  
**RIDADR :** 2912  
**RTECS :** YR3850000  
**HazardClass :** 7

PackingGroup : II

# URANYL NITRATE HEXAHYDRATE Chemical Properties, Usage, Production

## Chemical Properties

yellow crystals

## General Description

Acidic solution in water of uranyl nitrate, a radioactive yellow crystalline solid. Mildly chemically toxic. Contains nitric acid. Noncombustible, but will accelerate the burning of other combustible materials if concentrated or if the water evaporates. Large quantities may explode if exposed to fire. Produces toxic oxides of nitrogen if involved in fire. Radioactive materials emit certain rays which can be detected only by instruments. Unirradiated uranium is only mildly radioactive. Minimal radiation hazard during transportation. No protective shielding is required. Non-fissile (natural or depleted) uranium, containing not more than 1.0% u-235, cannot sustain a nuclear chain reaction.

## Air & Water Reactions

Dissolves in water forming a weak solution of nitric acid, the reaction is not hazardous.

## Reactivity Profile

Mixtures of metal/nonmetal nitrates with alkyl esters may explode, owing to the formation of alkyl nitrates; mixtures a nitrate with phosphorus, tin (II) chloride, or other reducing agents may react explosively [Bretherick 1979. p. 108-109]. Dissolves in water forming a weak solution of nitric acid, the reaction is not hazardous.

## Health Hazard

Radiation presents minimal risk to transport workers, emergency response personnel and the public during transportation accidents. Packaging durability increases as potential hazard of radioactive content increases. Undamaged packages are safe. Contents of damaged packages may cause higher external radiation exposure, or both external and internal radiation exposure if contents are released. Low radiation hazard when material is inside container. If material is released from package or bulk container, hazard will vary from low to moderate. Level of hazard will depend on the type and amount of radioactivity, the kind of material it is in, and/or the surfaces it is on. Some material may be released from packages during accidents of moderate severity but risks to people are not great. Released radioactive materials or contaminated objects usually will be visible if packaging fails. Some exclusive use shipments of bulk and packaged materials will not have "RADIOACTIVE" labels. Placards, markings and shipping papers provide identification. Some packages may have a "RADIOACTIVE" label and a second hazard label. The second hazard is usually greater than the radiation hazard; so follow this GUIDE as well as the response GUIDE for the second hazard class label. Some radioactive materials cannot be detected by commonly available instruments. Runoff from control of cargo fire may cause low-level pollution.

## URANYL NITRATE HEXAHYDRATE Preparation Products And Raw materials

### Raw materials

### Preparation Products

## URANYL NITRATE HEXAHYDRATE Suppliers Global(23)Suppliers

CHINA 4

Supplier	Tel	Fax	Email	Country	ProdList	Advantage
<a href="#">ProChem, Inc.</a>	--	--	prochem1@aol.com	USA	<a href="#">1655</a>	56
<a href="#">Leancare Ltd.</a>	--	--	enquiry@leancare.co.uk	UNITED KINGDOM	<a href="#">6944</a>	42
<a href="#">MOLEKULA Ltd.</a>	--	--	kevinbanks@molekula.com	UNITED KINGDOM	<a href="#">6519</a>	46
<a href="#">SIGMA-RBI</a>	--	--		SWITZERLAND	<a href="#">6657</a>	91
<a href="#">Nanjing Chemlin Chemical Co., Ltd</a>	--	--	sales@chemlin.com.cn	CHINA	<a href="#">6024</a>	56
<a href="#">2A PharmaChem USA</a>	--	--	sales@2apharmachem.com	USA	<a href="#">6446</a>	39
<a href="#">HONEST JOY HOLDINGS LIMITED</a>	--	--	sales@honestjoy.cn	USA	<a href="#">6294</a>	54
<a href="#">Advance Scientific &amp; Chemical</a>	--	--	sales@advance-scientific.com	USA	<a href="#">6029</a>	71
<a href="#">Shanghai Haiqu Chemical Co., Ltd</a>	--	--	haiqu@haiquchem.com	CHINA	<a href="#">1322</a>	64
<a href="#">aladdin-reagent</a>	--	--		CHINA	<a href="#">1686</a>	73

13520-83-7(URANYL NITRATE HEXAHYDRATE)Related Search:

[URANIUM\(IV\) OXIDE](#) URANYL NITRATE HEXAHYDRATE [bis\(nitrato-O,O'\)dioxouranium](#) URANIUM [Nitric acid](#)

General Use URANIUM NITRATE URANIUM NITRATE, HEXAHYDRATE URANYL DINITRATE HEXAHYDRATE

URANYL NITRATE HEXAHYDRATE URANYL NITRATE HYDRATE Puriss p.a. ACS bis(nitrato)dioxo-uraniuhexahydrate dinitratodioxo-uraniuhexahydrate hexahydrate(t-4)-uraniu Uranium,bis(nitrato)dioxo-,hexahydrate

Uranium,dinitratodioxo-,hexahydrate uranyl nitrate,hexahydrate,solution 13520-83-7 Analytical Reagents Analytical Chromatography Product Catalog Dinitratodioxouranium , hexahydrate bis(nitrato-O)dioxouranium URANYL NITRATE

HEXAHYDRATE, ACS URANIUM (VI) DINITRATE OXIDE HEXAHYDRATE 99+% URANYL NITRATE GR

Uranium nitrate hydrate  $2\text{NO}_3\text{O}_2\text{U}_6\text{H}_2\text{O}$  Uranium, bis(nitrato-.kappa.O)dioxo-, (T-4)- Uranium, bis(nitrato-.kappa.O)

dioxo-, hexahydrate, (T-4)- URANYLNITRATE,HEXAHYDRATE,CRYSTAL,REAGENT,ACS

URANIUMOXYNITRATE  $\text{UO}_2\text{NO}_3\text{26H}_2\text{O}$  Analytical Reagents for General Use Puriss p.a. ACS T-Z, Puriss p.a. ACS

Uranyl Nitrate, Hexahydrate, Crystal, Reagent URANYL(2+)NITRATEHEXAHYDRATE  $\text{N}_2\text{O}_8\text{U}_6\text{H}_2\text{O}$

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Manufacturer's CAGE: 1P573



# Material Safety Data Sheet

**SPI #02546-AB SPI-Chem™ Uranyl Nitrate Hexahydrate**
**Section 01 Identification**

 Date Effective..... March 3, 2010  
 (most recent revision)

Chemical Name/Synonyms... Uranyl Nitrate Hexahydrate

Emergencies

Contacting CHEMTREC:

24 Hour Emergency Use Only #'s...

Worldwide phone: 1-(703)-527-3887

Worldwide FAX: 1-(703)-741-6090

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



Product or Trade Name.... SPI #02546-AB Uranyl nitrate hexahydrate

Synonyms: Uranyl(VI)nitrate hexahydrate; Dinitratodioxouranium hexahydrate;

Uranyl dinitrate hexahydrate; Uranium, bis(nitrato-O)dioxo-,hexahydrate(T-4)-(9CI)

Chemical Family: Radioactive material

Chemical Formula:  $N_2O_8U \cdot 6H_2O$ 

RTECS #: YR3850000

<b>Hazardous Material Information System USA</b>	Health	3	<b>National Fire Protection Association USA</b>	
	Fire Hazard	0		
	Reactivity	0		
	Personal Protection	3		

NFPA Rating:

(estimated) Health: 3; Flammability: 0 ; Reactivity: 3

**Section 2 Composition**

Component Name	CAS #	%	EINECS/ELINCS
Uranyl Nitrate Hexahydrate	13520-83-7	99.9	n/a

---

### 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

**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. If irritation develops or persists, seek medical attention.

**Ingestion:** If swallowed, and the victim is conscious, wash out mouth with water. Seek immediate medical attention.

**Inhalation:** If inhaled, remove to fresh air. If breathing is difficult, seek immediate medical attention.

---

### 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.

---

## Section 6: Accidental Release Measures

### General Information:

Evacuate area. Handle as a radioactive spill.

### Spills/Leaks:

Wear self-contained breathing apparatus, rubber boots and heavy rubber gloves. Sweep up, place in a bag, and hold for waste disposal. Avoid raising dust. 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.

### Storage:

Store in cool, dry area in tightly closed containers. 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.

### Exposure Limits:

USA MSHA	Standard-air	TWA = 0.2 mg (U) /m <sup>3</sup>
USA OSHA	PEL 8hr	TWA = 0.05 mg (U) /m <sup>3</sup>

### Personal Protective Equipment

**Eyes:** Chemical splash goggles

**Skin:** Chemical-resistant gloves, other protective clothing such as long sleeves or a lab coat should be worn to prevent skin contact.

**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

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

Hazardous Decomposition of Products: Oxides of uranium, Nitrogen oxides

Hazardous Polymerization: Will not occur.

---

## Section 11: Toxicological Information

RTECS#: SD4431500

LD<sub>50</sub>/LC<sub>50</sub> Information:

LD509      Mouse, intravenous      63 mg/kg

Carcinogenicity:

CAS# 4197-25-5 is not listed by ACGIH, IARC, NTP, OR California Proposition 65.

Teratogenicity: Not known

Reproductive Effects: Not known

Neurotoxicity: Not known

Mutagenicity: Not known

Other Studies: Not known

---

**Section 12: Ecological Information**

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**

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

---

**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: NO

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

**California No Significant Risk Level:**

California Prop. 65: This product is known to the state of California to cause cancer.

**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 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.

---

**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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Tuesday October 26, 2010

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# CAMEO Chemicals

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chemicals: 0

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# URANYL NITRATE, HEXAHYDRATE, SOLUTION

[Chemical Identifiers](#) | [Hazards](#) | [Response Recommendations](#) | [Physical Properties](#) | [Regulatory Information](#) | [Alternate Chemical Names](#)

## Chemical Identifiers

[What is this information?](#) ▶

UN/NA Number	CAS Number	CHRIS Code	DOT Hazard Label
<a href="#">2980</a>	13520-83-7	none	RADIOACTIVE CORROSIVE

**NFPA 704:** data unavailable

## General Description

Acidic solution in water of uranyl nitrate, a radioactive yellow crystalline solid. Mildly chemically toxic. Contains nitric acid. Noncombustible, but will accelerate the burning of other combustible materials if concentrated or if the water evaporates. Large quantities may explode if exposed to fire. Produces toxic oxides of nitrogen if involved in fire. Radioactive materials emit certain rays which can be detected only by instruments. Unirradiated uranium is only mildly radioactive. Minimal radiation hazard during transportation. No protective shielding is required. Non-fissile (natural or depleted) uranium; containing not more than 1.0% u-235, cannot sustain a nuclear chain reaction.

## Hazards

[What is this information?](#) ▶

## Reactivity Alerts

- ⚠ Strong Oxidizing Agent
- ⚠ Radioactive Material

## Air & Water Reactions

Dissolves in water forming a weak solution of nitric acid, the reaction is not hazardous.

## Fire Hazard

Some of these materials may burn, but most do not ignite readily. Uranium and Thorium metal cuttings may ignite spontaneously if exposed to air, refer to GUIDE 136 below. Nitrates are oxidizers and may ignite other combustibles, refer to GUIDE 141 below.

GUIDE 136: Extremely flammable; will ignite itself if exposed to air. Burns rapidly, releasing dense, white, irritating fumes. Substance may be transported in a molten form. May re-ignite after fire is extinguished. Corrosive substances in contact with metals may produce flammable hydrogen gas. Containers may explode when heated.

GUIDE 141: These substances will accelerate burning when involved in a fire. May explode from heat or contamination. Some may burn rapidly. Some will react explosively with hydrocarbons (fuels). May ignite combustibles (wood, paper, oil, clothing, etc.). Containers may explode when heated. Runoff may create fire or explosion hazard. (ERG, 2008)

## Health Hazard

Radiation presents minimal risk to transport workers, emergency response personnel and the public during transportation accidents. Packaging durability increases as potential hazard of

radioactive content increases. Undamaged packages are safe. Contents of damaged packages may cause higher external radiation exposure, or both external and internal radiation exposure if contents are released. Low radiation hazard when material is inside container. If material is released from package or bulk container, hazard will vary from low to moderate. Level of hazard will depend on the type and amount of radioactivity, the kind of material it is in, and/or the surfaces it is on. Some material may be released from packages during accidents of moderate severity but risks to people are not great. Released radioactive materials or contaminated objects usually will be visible if packaging fails. Some exclusive use shipments of bulk and packaged materials will not have "RADIOACTIVE" labels. Placards, markings and shipping papers provide identification. Some packages may have a "RADIOACTIVE" label and a second hazard label. The second hazard is usually greater than the radiation hazard; so follow this GUIDE as well as the response GUIDE for the second hazard class label. Some radioactive materials cannot be detected by commonly available instruments. Runoff from control of cargo fire may cause low-level pollution. (ERG, 2008)

### Reactivity Profile

Mixtures of metal/nonmetal nitrates with alkyl esters may explode, owing to the formation of alkyl nitrates; mixtures a nitrate with phosphorus, tin (II) chloride, or other reducing agents may react explosively [Bretherick 1979. p. 108-109]. Dissolves in water forming a weak solution of nitric acid, the reaction is not hazardous.

### Belongs to the Following Reactive Group(s)

- Inorganic Oxidizing Agents
- Water

## Response Recommendations

What is this information? ►

### Firefighting

Contact the local, state, or Department Of Energy Radiological Response Team. Flood with water. Cool all affected containers with flooding quantities of water. Apply water from as far a distance as possible. (AAR, 2003)

### Non-Fire Response

Contact the local, state, or Department Of Energy Radiological Response Team. Keep sparks, flames, and other sources of ignition away. Keep material out of water sources and sewers. Build dikes to contain flow as necessary. Land spill: Dig a pit, pond, lagoon, holding area to contain liquid or solid material. Dike surface flow using soil, sand bags, foamed polyurethane, or foamed concrete. Absorb bulk liquid with fly ash, cement powder, or commercial sorbents. Neutralize with agricultural lime (CaO), crushed limestone (CaCO<sub>3</sub>) or sodium bicarbonate (NaHCO<sub>3</sub>). Water spill: Neutralize with agricultural lime (CaO), crushed limestone (CaCO<sub>3</sub>), or sodium bicarbonate (NaHCO<sub>3</sub>). Adjust pH to neutral (pH=7). Use mechanical dredges or lifts to remove immobilized masses of pollutants and precipitates. (AAR, 2003)

### Protective Clothing

Keep upwind. Avoid breathing dusts, and fumes from burning material. Wear appropriate chemical protective clothing. Wear positive pressure self-contained breathing apparatus. Do not handle broken packages unless wearing appropriate personal protective equipment. Wash away any material which may have contacted the body with copious amounts of water or soap and water. (AAR, 2003)

### First Aid

Call 911 or emergency medical service. Medical problems take priority over radiological concerns. Use first aid treatment according to the nature of the injury. Do not delay care and transport of a seriously injured person. Give artificial respiration if victim is not breathing. Administer oxygen if breathing is difficult. In case of contact with substance, wipe from skin immediately; flush skin or eyes with running water for at least 20 minutes. Injured persons contaminated by contact with released material are not a serious hazard to health care personnel, equipment or facilities. Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves and prevent spread of contamination. (ERG, 2008)

**Physical Properties**

[What is this information?](#) ▶

**Molecular Formula:** H2O.1  
6N2O8U

Flash Point: data unavailable  
Lower Explosive Limit: data unavailable  
Upper Explosive Limit: data unavailable  
Autoignition Temperature: data unavailable  
Melting Point: data unavailable  
Vapor Pressure: data unavailable  
Vapor Density: data unavailable  
Specific Gravity: data unavailable  
Boiling Point: data unavailable  
Molecular Weight: data unavailable  
Water Solubility: data unavailable  
AEGL: data unavailable  
ERPG: data unavailable

**TEEL-1**  
1.27 mg/m3  
(SCAPA, 2008)

**TEEL-2**  
1.27 mg/m3

**TEEL-3**  
21.1 mg/m3

**IDLH:** 10.0 mg/m3 As U (soluble compounds, as U); A potential human carcinogen. (NIOSH, 2003)

**Regulatory Information**

[What is this information?](#) ▶

**Regulatory Names:** none  
**CAA RMP:** Not a regulated chemical.  
**CERCLA:** Not a regulated chemical.  
**EHS (EPCRA 302):** Not a regulated chemical.  
**TRI (EPCRA 313):** Not a regulated chemical.  
**RCRA Chemical Code:** none

**Alternate Chemical Names**

[What is this information?](#) ▶

- DINITRATODIOXOURANIUM HEXAHYDRATE
- NITRATE D'URANYLE, HEXAHYDRATÉ, EN SOLUTION (DOT FRENCH)
- NITRATO DE URANILO, HEXAHIDRATADO, EN SOLUCIÓN (DOT SPANISH)
- URANIUM (SOLUBLE COMPOUNDS, AS U)
- URANIUM DIOXIDE DINITRATE, HEXAHYDRATE
- URANIUM, BIS(NITRATO-O)DIOXO-, HEXAHYDRATE, (T-4)-
- URANIUM, DINITRATODIOXO-, HEXAHYDRATE
- URANYL DINITRATE HEXAHYDRATE
- URANYL NITRATE HEXAHYDRATE

- URANYL NITRATE HEXAHYDRATE SOLUTION

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<b>Title</b>	PHYSICO-CHEMICAL PROPERTIES OF URANYL NITRATES, NITRIC ACID SOLUTIONS AND DETERMINATION OF THEIR COMPOSITION
<b>Creator/Author</b>	Slepyan, T.A. ; Karpacheva, S.M.
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<b>Research Org</b>	Originating Research Org. not identified
<b>Subject</b>	CHEMISTRY; BEHAVIOR; DENSITY; ELECTRIC CONDUCTIVITY; NITRIC ACID; REFRACTION; SOLUTIONS; URANYL NITRATES; VISCOSITY; WATER
<b>Description/Abstract</b>	Specific weight, viscosity, electroconductivity, and refractive index of uranyl nitrate--nitric acid--water systems in the concentration ranges 0 to 2 M uranyl nitrate were investigated. The specific weight was calculated by the formula $d = d_{\text{sub } 0} + 0.17c_{\text{sub } U} + 0.029c_{\text{sub } H}$ with an order of accuracy of 0.5%; the index of refraction was calculated by $n = n_{\text{sub } 0} + 0.339c_{\text{sub } U} + 0.0067c_{\text{sub } H}$ with an order of accuracy of 0.2%. A method is suggested for determining the composition of the system, and a diagram is plotted of specific weight electroconductivity, and refractive index. (R. V.J.)
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