ICP-AM-MISA6

High-Purity Standards

Chemwatch Hazard Alert Code: **3**

Catalogue number: **ICP-AM-MISA6**
Version No: **1.1**
Safety Data Sheet according to OSHA HazCom Standard (2012) requirements

Issue Date: **08/30/2017**
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S.GHS.USA.EN

SECTION 1 IDENTIFICATION

Product Identifier

Product name	ICP-AM-MISA6
Chemical Name	water
Synonyms	Not Available
Proper shipping name	Corrosive liquid, acidic, inorganic, n.o.s.
Other means of identification	ICP-AM-MISA6

Recommended use of the chemical and restrictions on use

Relevant identified uses	*This radioactive material may be supplied in a variety of package types and may exhibit a range of specific activities.*

Name, address, and telephone number of the chemical manufacturer, importer, or other responsible party

Registered company name	High-Purity Standards
Address	PO Box 41727 SC 29423 United States
Telephone	843-767-7900
Fax	843-767-7906
Website	highpuritystandards.com
Email	Not Available

Emergency phone number

Association / Organisation	INFOTRAC
Emergency telephone numbers	1-800-535-5053
Other emergency telephone numbers	1-352-323-3500

SECTION 2 HAZARD(S) IDENTIFICATION

Classification of the substance or mixture

Classification	Metal Corrosion Category 1, Skin Corrosion/Irritation Category 1B

Label elements

Hazard pictogram(s)	
SIGNAL WORD	**DANGER**

Hazard statement(s)

H290	May be corrosive to metals.
H314	Causes severe skin burns and eye damage.

Hazard(s) not otherwise specified

Not Applicable

Continued...

Precautionary statement(s) Prevention

P260	Do not breathe dust/fume/gas/mist/vapours/spray.

Precautionary statement(s) Response

P301+P330+P331	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

Precautionary statement(s) Storage

P405	Store locked up.

Precautionary statement(s) Disposal

P501	Dispose of contents/container in accordance with local regulations.

SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS

Substances

See section below for composition of Mixtures

Mixtures

CAS No	%[weight]	Name
7429-90-5	0.01	aluminium
10022-31-8	0.01	barium nitrate
7440-42-8	0.01	boron
7440-43-9	0.01	cadmium
7440-70-2	0.01	calcium
7440-46-2	0.01	caesium
7440-47-3	0.01	chromium
7440-48-4	0.01	cobalt
7440-50-8	0.01	copper
7440-55-3	0.01	gallium
7440-74-6	0.01	indium
7439-89-6	0.01	iron
7439-92-1	0.01	lead
7439-93-2	0.01	lithium
7439-95-4	0.01	magnesium
6156-78-1	0.01	manganese(II) acetate tetrahydrate
7440-02-0	0.01	nickel
7722-76-1	0.01	ammonium phosphate, monobasic
7440-09-7	0.01	potassium
7440-17-7	0.01	rubidium
7440-22-4	0.01	silver
7440-23-5	0.01	sodium
7440-24-6	0.01	strontium
7440-28-0	0.01	thallium
10102-06-4	0.01	uranyl nitrate
7803-55-6	0.01	ammonium metavanadate
7440-66-6	0.01	zinc
7697-37-2	2	nitric acid
7732-18-5	Balance	water

The specific chemical identity and/or exact percentage (concentration) of composition has been withheld as a trade secret.

SECTION 4 FIRST-AID MEASURES

Description of first aid measures

Eye Contact	▸ **GET MEDICAL ATTENTION IMMEDIATELY** ▸ Remove victim to a restricted area for decontamination. ▸ Thoroughly wash eyes with large amounts of water, occasionally lifting the upper and lower eyelids (for approximately 15 minutes). ▸ Following the water treatment, provide an isotonic solution. ▸ **DO NOT** use eye baths, rather provide a continuous and copious supply of fluid. ▸ Monitor the victim for radioactivity. If activity is present, rewash the eyes and remonitor until little or no radioactivity is present. ▸ Any water used to wash the victim's eyes must be stored in a metal container for later disposal. Any other articles that are used to decontaminate the victim must also be stored in metal containers for later decontamination or disposal. ▸ Any personnel involved in rendering first aid to the victim must be monitored for radioactivity and decontaminated if necessary

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	IAEA Safety Series No.: 47 Manual on Early Medical Treatment of Possible Radiation Injury, 1978, p.35.
Skin Contact	For thermal burns: ▸ Decontaminate area around burn. ▸ Consider the use of cold packs and topical antibiotics. For first-degree burns (affecting top layer of skin) ▸ Hold burned skin under cool (not cold) running water or immerse in cool water until pain subsides. ▸ Use compresses if running water is not available. ▸ Cover with sterile non-adhesive bandage or clean cloth. ▸ Do NOT apply butter or ointments; this may cause infection. ▸ Give over-the counter pain relievers if pain increases or swelling, redness, fever occur. For second-degree burns (affecting top two layers of skin) ▸ Cool the burn by immerse in cold running water for 10-15 minutes. ▸ Use compresses if running water is not available. ▸ Do NOT apply ice as this may lower body temperature and cause further damage. ▸ Do NOT break blisters or apply butter or ointments; this may cause infection. ▸ Protect burn by cover loosely with sterile, nonstick bandage and secure in place with gauze or tape. To prevent shock: (unless the person has a head, neck, or leg injury, or it would cause discomfort): ▸ Lay the person flat. ▸ Elevate feet about 12 inches. ▸ Elevate burn area above heart level, if possible. ▸ Cover the person with coat or blanket. ▸ Seek medical assistance. For third-degree burns Seek immediate medical or emergency assistance. In the mean time: ▸ Protect burn area cover loosely with sterile, nonstick bandage or, for large areas, a sheet or other material that will not leave lint in wound. ▸ Separate burned toes and fingers with dry, sterile dressings. ▸ Do not soak burn in water or apply ointments or butter; this may cause infection. ▸ To prevent shock see above. ▸ For an airway burn, do not place pillow under the person's head when the person is lying down. This can close the airway. ▸ Have a person with a facial burn sit up. ▸ Check pulse and breathing to monitor for shock until emergency help arrives. The objectives of skin decontamination are to remove as much of the radionucleotide as practicable in order to reduce the surface dose rate and to prevent activity from entering the body. Over-aggressive skin decontamination procedures must be avoided since these may injure the natural barriers of the skin and increase percutaneous absorption. **IT IS IMPERATIVE THAT THE SKIN SHOULD BE DECONTAMINATED AS QUICKLY AS POSSIBLE** It is **IMPORTANT** to review each potential exposure, prior to the first use of the radioactive substance, to establish whether an alternative decontamination regime exists should simple washing techniques prove to be inadequate. (see point 4 below) If radioactive contamination is suspected: ▸ Gently brush away dry particles or blot excess liquids with absorbent materials; ensure responders are adequately protected. ▸ Where possible, rinse victim in warm water (30 deg. C.); caution must be exercised to ensure that areas of tissue damage or body cavity openings are **NOT** rinsed. ▸ Wash victim with mild liquid soap and large quantities of water. Pay particular attention to the head, finger nails and palms of the hands ▸ On completion of the washing, monitor the victim for radioactivity. If water and soap have been inadequate in removing the radioactive material, decontaminating compounds consisting of surfactants and absorbent substances may be effective. Complexing reagents may also be of use. ▸ The use of organic solvents is to be avoided as they may increase the solubility and absorption of the radioactive substance. ▸ Skin contamination with radiation may be an indication that other parts of the body have been exposed. ▸ Contaminated clothing must be stored in a metal container for later decontamination or disposal. ▸ The water used to wash the victim must be stored in metal containers for later disposal. ▸ Any personnel involved in rendering first aid to the victim must be monitored for radioactivity and decontaminated if necessary. IAEA Safety Series No.: 47 Manual on Early Medical Treatment of Possible Radiation Injury, 1978, p.9.
Inhalation	**IMPORTANT**: For patients with life-threatening injuries (from incidents involving small quantity release) and particle or liquid exposure, decontamination procedures must be initiated: **GET MEDICAL ATTENTION IMMEDIATELY.** ▸ **NOTE:** Personal Protective Equipment (PPE), including positive pressure self-contained breathing apparatus may be required to assure the safety of the rescuer. ▸ Remove from exposure area to a restricted area with fresh air as quickly as possible. ▸ Remove, as soon as possible, patient's clothing, jewelry and shoes. ▸ Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures ▸ If breathing has stopped, perform artificial respiration by administering oxygen; mouth-to-mouth resuscitation should be avoided to prevent exposure to the person rendering first aid. ▸ Any evidence of serious contamination indicates that treatment must be initiated. (Inhalation of radioactive particles may indicate that other parts of the body were also contaminated, such as the digestive tract, skin and eyes.) ▸ If time permits, wipe the face with wet filter paper, force coughing and blowing of the nose. Thorough decontamination should be started prior to the victim being removed to the medical area ▸ Package the patient using transportation bags, plastic or blankets; this ensures that contamination is limited during transportation. ▸ Provide adequate ambulance ventilation (intake and exhaust fans of appropriate design and capacity). ▸ Notify Emergency Department that a potentially contaminated patient is enroute; supply all available information regarding the nature and identity of the contaminant. ▸ Any personnel involved in rendering first aid must be monitored for radioactivity and thoroughly decontaminated if necessary.
Ingestion	▸ In case of ingestion of radioactive substances, the mouth should be rinsed out immediately after the accident, care being taken not to swallow the water used for this purpose. ▸ Vomiting should be induced either mechanically, or with syrup of Ipecac. **DO NOT** induce vomiting in an unconscious person. * ▸ Further action depends on the nature of the radioactive substance. ▸ Get medical attention immediately. ▸ The victim must be monitored for radioactivity and decontaminated, if necessary, before being transported to a medical facility. ▸ Any personnel involved in rendering first aid to the victim must be monitored for radioactivity and decontaminated if necessary. - * The vomitus and lavage fluids should be saved for examination and monitoring. The gastric fluids and fluids used for lavage must be stored in metal containers for later disposal. IAEA Safety Series No.: 47 Manual on Early Medical Treatment of Possible Radiation Injury, 1978, p.59.

Most important symptoms and effects, both acute and delayed

See Section 11

Continued...

Indication of any immediate medical attention and special treatment needed

Treat symptomatically.
For acute or short term repeated exposures to strong acids:
- Airway problems may arise from laryngeal edema and inhalation exposure. Treat with 100% oxygen initially.
- Respiratory distress may require cricothyroidotomy if endotracheal intubation is contraindicated by excessive swelling
- Intravenous lines should be established immediately in all cases where there is evidence of circulatory compromise.
- Strong acids produce a coagulation necrosis characterised by formation of a coagulum (eschar) as a result of the dessicating action of the acid on proteins in specific tissues.

INGESTION:
- Immediate dilution (milk or water) within 30 minutes post ingestion is recommended.
- **DO NOT** attempt to neutralise the acid since exothermic reaction may extend the corrosive injury.
- Be careful to avoid further vomit since re-exposure of the mucosa to the acid is harmful. Limit fluids to one or two glasses in an adult.
- Charcoal has no place in acid management.
- Some authors suggest the use of lavage within 1 hour of ingestion.

SKIN:
- Skin lesions require copious saline irrigation. Treat chemical burns as thermal burns with non-adherent gauze and wrapping.
- Deep second-degree burns may benefit from topical silver sulfadiazine.

EYE:
- Eye injuries require retraction of the eyelids to ensure thorough irrigation of the conjuctival cul-de-sacs. Irrigation should last at least 20-30 minutes. **DO NOT** use neutralising agents or any other additives. Several litres of saline are required.
- Cycloplegic drops, (1% cyclopentolate for short-term use or 5% homatropine for longer term use) antibiotic drops, vasoconstrictive agents or artificial tears may be indicated dependent on the severity of the injury.
- Steroid eye drops should only be administered with the approval of a consulting ophthalmologist).

[Ellenhorn and Barceloux: Medical Toxicology]

For radiation poisoning:
- Lavage may be useful. Care should be taken to avoid aspiration.
- The vomitus and lavage fluids should be saved for examination and monitoring. The gastric fluids and fluids used for lavage must be stored in metal containers for later disposal.
- There is no antidote for radiation sickness
- Treatment should be symptomatic and supportive, regardless of the dose received. IAEA Safety Series No.: 47; Manual on Early Medical Treatment of Possible Radiation Injury, 1978, p.35.

BASIC TREATMENT

- Establish a patent airway with suction where necessary.
- Watch for signs of respiratory insufficiency and assist ventilation as necessary.
- Administer oxygen by non-rebreather mask at 10 to 15 l/min.
- Monitor and treat, where necessary, for shock.
- Anticipate seizures.
- Routine emergency care may be necessary for associated injuries.
- Do not use emetics. Where ingestion is suspected rinse mouth and give up to 200 ml water (5 ml/kg recommended) for dilution where patient is able to swallow, has a strong gag reflex and does not drool.
- If necessary, perform BLS care.

ADVANCED TREATMENT

- Consider orotracheal or nasotracheal intubation for airway control in unconscious patient or where respiratory arrest has occurred.
- Monitor and treat, where necessary, for arrhythmias.
- Support vital signs with IV lactated Ringer's solution.
- Hypotension with signs of hypovolaemia requires the cautious administration of fluids. Fluid overload might create complications.
- Treat seizures with diazepam.
- Advanced life-support care may be needed.
- Proparacaine hydrochloride should be used to assist eye irrigation.
- Chelating agents may be useful if given before or immediately after exposure.

SPECIAL CONSIDERATIONS

- Symptoms associated with radioactives exposure are generally delayed. Treatment should address other medical problems or trauma.
- An accurate history of exposure is essential to determine proper treatment; Exposure to 100 rads is expected to produce GI symptoms such as nausea, vomiting, abdominal cramps, diarrhoea; onset of symptoms may be delayed for several hours. Exposure to 600 rads is expected to result in severe GI symptoms such as necrotic gastroenteritis which may result in dehydration and may be fatal within days. Exposure to several thousand rads is expected to produce neurological/ cardiovascular symptoms including confusion, lethargy, ataxia, seizures, coma, and cardiovascular collapse, within minutes or hours. Severe exposures may also produce bone marrow depression, leukopenia and infection.

BRONSTEIN, A.C. and CURRANCE, P.L. EMERGENCY CARE FOR HAZARDOUS MATERIALS EXPOSURE: 2nd Ed. 1994

SECTION 5 FIRE-FIGHTING MEASURES

Extinguishing media

- There is no restriction on the type of extinguisher which may be used.
- Use extinguishing media suitable for surrounding area.

Special hazards arising from the substrate or mixture

Fire Incompatibility	None known.

Special protective equipment and precautions for fire-fighters

Fire Fighting	▸ Alert Fire Brigade and tell them location and nature of hazard.
Fire/Explosion Hazard	▸ Non combustible. When aluminium oxide dust is dispersed in air, firefighters should wear protection against inhalation of dust particles, which can also contain hazardous substances from the fire absorbed on the alumina particles.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Continued...

See section 8

Environmental precautions

See section 12

Methods and material for containment and cleaning up

Minor Spills	Prior to working with radioactive material, devise a written procedure for handling a cleanup of small and large spills.
Major Spills	▸ **DO NOT** touch damaged containers or spilled materials.

Personal Protective Equipment advice is contained in Section 8 of the SDS.

SECTION 7 HANDLING AND STORAGE

Precautions for safe handling

Safe handling	▸ All work with unsealed radioactive substances shall be segregated from other work and, where possible, carried out in a laboratory or workplace reserved solely for this purpose.
Other information	▸ Special security requirements apply in Federal/State regulation to the storage, packaging and handling of radioactive materials.

Conditions for safe storage, including any incompatibilities

Suitable container	For packaging of radioisotopes.
Storage incompatibility	For aluminas (aluminium oxide): Incompatible with hot chlorinated rubber. ▸ WARNING: Avoid or control reaction with peroxides. ▸ Avoid strong acids, acid chlorides, acid anhydrides and chloroformates. ▸ Avoid strong bases.

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Control parameters

OCCUPATIONAL EXPOSURE LIMITS (OEL)

INGREDIENT DATA

Source	Ingredient	Material name	TWA	STEL	Peak	Notes
US NIOSH Recommended Exposure Limits (RELs)	aluminium	Aluminium, Aluminum metal, Aluminum powder, Elemental aluminum	10 (total), 5 (resp) mg/m3	Not Available	Not Available	Not Available
US OSHA Permissible Exposure Levels (PELs) - Table Z1	aluminium	Aluminum, metal - Respirable fraction	5 mg/m3	Not Available	Not Available	Not Available
US OSHA Permissible Exposure Levels (PELs) - Table Z1	aluminium	Aluminum, metal	15 mg/m3	Not Available	Not Available	Total dust;(as Al)
US NIOSH Recommended Exposure Limits (RELs)	barium nitrate	Barium dinitrate, Barium(II) nitrate (1:2), Barium salt of nitric acid	0.5 mg/m3	Not Available	Not Available	[*Note: The REL also applies to other soluble barium compounds (as Ba) except Barium sulfate.]
US NIOSH Recommended Exposure Limits (RELs)	cadmium	Cadmium metal: Cadmium	Not Available	Not Available	Not Available	Ca See Appendix A [*Note: The REL applies to all Cadmium compounds (as Cd).]
US ACGIH Threshold Limit Values (TLV)	cadmium	Cadmium	0.01 mg/m3	Not Available	Not Available	TLV® Basis: Kidney dam; BEI
US OSHA Permissible Exposure Levels (PELs) - Table Z1	cadmium	Cadmium	Not Available	Not Available	Not Available	see 1910.1027;(as Cd)
US OSHA Permissible Exposure Levels (PELs) - Table Z2	cadmium	Cadmium fume	0.1 mg/m3	Not Available	0.3 mg/m3	(Z37.5-1970);This standard applies to any operations or sectors for which the Cadmium standard, 1910.1027, is stayed or otherwise not in effect
US OSHA Permissible Exposure Levels (PELs) - Table Z2	cadmium	Cadmium dust	0.2 mg/m3	Not Available	0.6 mg/m3	(Z37.5-1970);This standard applies to any operations or sectors for which the Cadmium standard, 1910.1027, is stayed or otherwise not in effect
US NIOSH Recommended Exposure Limits (RELs)	chromium	Chrome, Chromium	0.5 mg/m3	Not Available	Not Available	See Appendix C
US NIOSH Recommended Exposure Limits (RELs)	cobalt	Cobalt metal dust, Cobalt metal fume	0.05 mg/m3	Not Available	Not Available	Not Available
US ACGIH Threshold Limit Values (TLV)	cobalt	Hard metals containing Cobalt and Tungsten carbide, as Co	0.005 mg/m3	Not Available	Not Available	TLV® Basis: Pneumonitis
US OSHA Permissible Exposure Levels (PELs) - Table Z1	cobalt	Cobalt metal, dust, and fume	0.1 mg/m3	Not Available	Not Available	(as Co)
US NIOSH Recommended Exposure Limits (RELs)	copper	Copper metal dusts, Copper metal fumes	1 mg/m3	Not Available	Not Available	[*Note: The REL also applies to other copper compounds (as Cu) except Copper fume.]

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US ACGIH Threshold Limit Values (TLV)	copper	Copper - Dusts and mists, as Cu	1 mg/m3	Not Available	Not Available	TLV® Basis: Irr; Gl; metal fume fever; BEI
US ACGIH Threshold Limit Values (TLV)	copper	Copper - Fume, as Cu	0.2 mg/m3	Not Available	Not Available	TLV® Basis: Irr; Gl; metal fume fever; BEI
US OSHA Permissible Exposure Levels (PELs) - Table Z1	copper	Copper - Dusts and mists	1 mg/m3	Not Available	Not Available	(as Cu)
US OSHA Permissible Exposure Levels (PELs) - Table Z1	copper	Copper - Fume	0.1 mg/m3	Not Available	Not Available	(as Cu)
US NIOSH Recommended Exposure Limits (RELs)	indium	Indium metal	0.1 mg/m3	Not Available	Not Available	[*Note: The REL also applies to other indium compounds (as In).]
US NIOSH Recommended Exposure Limits (RELs)	lead	Lead metal, Plumbum	0.050 mg/m3	Not Available	Not Available	See Appendix C [*Note: The REL also applies to other lead compounds (as Pb) -- see Appendix C.]
US NIOSH Recommended Exposure Limits (RELs)	nickel	Nickel metal: Elemental nickel, Nickel catalyst	0.015 mg/m3	Not Available	Not Available	Ca See Appendix A [*Note: The REL does not apply to Nickel carbonyl.]
US ACGIH Threshold Limit Values (TLV)	nickel	Nickel and inorganic compounds including Nickel subsulfide, as Ni - Elemental	1.5 mg/m3	Not Available	Not Available	TLV® Basis: Dermatitis; pneumoconiosis
US NIOSH Recommended Exposure Limits (RELs)	silver	Silver metal: Argentum	0.01 mg/m3	Not Available	Not Available	Not Available
US NIOSH Recommended Exposure Limits (RELs)	nitric acid	Aqua fortis, Engravers acid, Hydrogen nitrate, Red fuming nitric acid (RFNA), White fuming nitric acid (WFNA)	5 mg/m3 / 2 ppm	10 mg/m3 / 4 ppm	Not Available	Not Available
US ACGIH Threshold Limit Values (TLV)	nitric acid	Nitric acid	2 ppm	4 ppm	Not Available	TLV® Basis: URT & eye irr; dental erosion
US OSHA Permissible Exposure Levels (PELs) - Table Z1	nitric acid	Nitric acid	5 mg/m3 / 2 ppm	Not Available	Not Available	Not Available

EMERGENCY LIMITS

Ingredient	Material name	TEEL-1	TEEL-2	TEEL-3
barium nitrate	Barium nitrate	2.9 mg/m3	350 mg/m3	2,100 mg/m3
boron	Boron	1.9 mg/m3	21 mg/m3	130 mg/m3
cadmium	Cadmium	Not Available	Not Available	Not Available
caesium	Cesium	5.6 mg/m3	61 mg/m3	370 mg/m3
chromium	Chromium	1.5 mg/m3	17 mg/m3	99 mg/m3
cobalt	Cobalt	0.18 mg/m3	2 mg/m3	20 mg/m3
copper	Copper	3 mg/m3	33 mg/m3	200 mg/m3
gallium	Gallium	30 mg/m3	330 mg/m3	2,000 mg/m3
indium	Indium	0.3 mg/m3	3.3 mg/m3	20 mg/m3
iron	Iron	3.2 mg/m3	35 mg/m3	150 mg/m3
lead	Lead	0.15 mg/m3	120 mg/m3	700 mg/m3
lithium	Lithium	3.3 mg/m3	36 mg/m3	220 mg/m3
magnesium	Magnesium	18 mg/m3	200 mg/m3	1,200 mg/m3
manganese(II) acetate tetrahydrate	Acetic acid, manganese(2+) salt, tetrahydrate	13 mg/m3	22 mg/m3	740 mg/m3
manganese(II) acetate tetrahydrate	Acetic acid, manganese(II) salt (2:1)	9.4 mg/m3	16 mg/m3	96 mg/m3
nickel	Nickel	4.5 mg/m3	50 mg/m3	99 mg/m3
ammonium phosphate, monobasic	Ammonium dihydrogen phosphate; (Monoammonium phosphate)	17 mg/m3	190 mg/m3	1,100 mg/m3
potassium	Potassium	2.3 mg/m3	25 mg/m3	150 mg/m3
rubidium	Rubidium	3.9 mg/m3	43 mg/m3	260 mg/m3
silver	Silver	0.3 mg/m3	170 mg/m3	990 mg/m3
sodium	Sodium	13 mg/m3	140 mg/m3	870 mg/m3
strontium	Strontium	30 mg/m3	330 mg/m3	2,000 mg/m3
thallium	Thallium	0.06 mg/m3	13 mg/m3	20 mg/m3
uranyl nitrate	Uranyl nitrate (solid); (Bis(nitrato-O,O')dioxouranium)	0.99 mg/m3	5.5 mg/m3	33 mg/m3
uranyl nitrate	Uranyl nitrate hexahydrate	1.3 mg/m3	7 mg/m3	42 mg/m3
uranyl nitrate	Uranyl nitrate (yellow salt)	0.99 mg/m3	5.5 mg/m3	33 mg/m3
ammonium metavanadate	Ammonium vanadate; (Ammonium vanadium oxide; Ammonium metavanadate)	0.01 mg/m3	0.11 mg/m3	80 mg/m3
zinc	Zinc	6 mg/m3	21 mg/m3	120 mg/m3
nitric acid	Nitric acid	Not Available	Not Available	Not Available

Ingredient	Original IDLH	Revised IDLH

Continued...

aluminium	Not Available	Not Available
barium nitrate	1,100 mg/m3	50 mg/m3
boron	Not Available	Not Available
cadmium	50 mg/m3 / 9 mg/m3	9 mg/m3 / 9 [Unch] mg/m3
calcium	Not Available	Not Available
caesium	Not Available	Not Available
chromium	N.E. / N.E.	250 mg/m3
cobalt	20 mg/m3	20 [Unch] mg/m3
copper	N.E. / N.E.	100 mg/m3
gallium	Not Available	Not Available
indium	Not Available	Not Available
iron	Not Available	Not Available
lead	700 mg/m3	100 mg/m3
lithium	Not Available	Not Available
magnesium	Not Available	Not Available
manganese(II) acetate tetrahydrate	N.E. / N.E.	500 mg/m3
nickel	N.E. / N.E.	10 mg/m3
ammonium phosphate, monobasic	Not Available	Not Available
potassium	Not Available	Not Available
rubidium	Not Available	Not Available
silver	N.E. / N.E.	10 mg/m3
sodium	Not Available	Not Available
strontium	Not Available	Not Available
thallium	Not Available	Not Available
uranyl nitrate	20 mg/m3	10 mg/m3
ammonium metavanadate	Not Available	Not Available
zinc	Not Available	Not Available
nitric acid	100 ppm	25 ppm
water	Not Available	Not Available

Exposure controls

Appropriate engineering controls	For potential exposure to radioactive substances, local exhaust or process enclosure ventilation should be provided as a minimum.
Personal protection	
Eye and face protection	▸ Most safety glasses will provide protection against alpha particles, some protection against beta particles (depending on thickness) but will not shield gamma radiation.
Skin protection	See Hand protection below
Hands/feet protection	Disposable gloves.
Body protection	See Other protection below
Other protection	Disposable overgarments, including head and foot coverings should be worn by any employee engaged in handling radioactive substances *in the workplace.*
Thermal hazards	Not Available

Respiratory protection

Particulate.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Appearance	Light Grey

Physical state	Liquid	**Relative density (Water = 1)**	Not Available
Odour	Not Available	**Partition coefficient n-octanol / water**	Not Available
Odour threshold	Not Available	**Auto-ignition temperature (°C)**	Not Available
pH (as supplied)	Not Available	**Decomposition temperature**	Not Available

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Melting point / freezing point (°C)	Not Available	**Viscosity (cSt)**	Not Available
Initial boiling point and boiling range (°C)	Not Available	**Molecular weight (g/mol)**	Not Available
Flash point (°C)	Not Available	**Taste**	Not Available
Evaporation rate	Not Available	**Explosive properties**	Not Available
Flammability	Not Available	**Oxidising properties**	Not Available
Upper Explosive Limit (%)	Not Available	**Surface Tension (dyn/cm or mN/m)**	Not Available
Lower Explosive Limit (%)	Not Available	**Volatile Component (%vol)**	Not Available
Vapour pressure (kPa)	Not Available	**Gas group**	Not Available
Solubility in water (g/L)	Miscible	**pH as a solution (1%)**	Not Available
Vapour density (Air = 1)	Not Available	**VOC g/L**	Not Available

SECTION 10 STABILITY AND REACTIVITY

Reactivity	See section 7
Chemical stability	▸ Unstable in the presence of incompatible materials.
Possibility of hazardous reactions	See section 7
Conditions to avoid	See section 7
Incompatible materials	See section 7
Hazardous decomposition products	See section 5

SECTION 11 TOXICOLOGICAL INFORMATION

Information on toxicological effects

Inhaled	The material is not thought to produce respiratory irritation (as classified by EC Directives using animal models). Inhalation of vapours or aerosols (mists, fumes), generated by the material during the course of normal handling, may be damaging to the health of the individual. Corrosive acids can cause irritation of the respiratory tract, with coughing, choking and mucous membrane damage. A whole body dose of 2-10 Gray may cause loss of appetite, tiredness, nausea and vomiting, most severe after 6-12 hours.
Ingestion	Accidental ingestion of the material may be damaging to the health of the individual. The kidney and liver can be damaged by uranium, causing excessive acid and urea in the blood and generalised ill health. Ingestion of acidic corrosives may produce burns around and in the mouth, the throat and oesophagus.
Skin Contact	This material can cause inflammation of the skin on contact in some persons. The material may accentuate any pre-existing dermatitis condition Skin contact is not thought to have harmful health effects (as classified under EC Directives); the material may still produce health damage following entry through wounds, lesions or abrasions. Though considered non-harmful, slight irritation may result from contact because of the abrasive nature of the aluminium oxide particles. Skin contact with acidic corrosives may result in pain and burns; these may be deep with distinct edges and may heal slowly with the formation of scar tissue. Open cuts, abraded or irritated skin should not be exposed to this material Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects.
Eye	This material can cause eye irritation and damage in some persons. Direct eye contact with acid corrosives may produce pain, tears, sensitivity to light and burns. The eye is particularly sensitive to radioactivity.
Chronic	There has been concern that this material can cause cancer or mutations, but there is not enough data to make an assessment. Animal testing shows long term exposure to aluminium oxides may cause lung disease and cancer, depending on the size of the particle. Repeated or prolonged exposure to acids may result in the erosion of teeth, swelling and/or ulceration of mouth lining. A single large or prolonged low exposure to radiation can cause delayed effects, including blood cancers, genetic disorders, shortened lifespan and cataracts.

ICP-AM-MISA6

TOXICITY	IRRITATION
Not Available	Not Available

aluminium

TOXICITY	IRRITATION
Oral (rat) LD50: >2000 mg/kg[1]	Not Available

barium nitrate

TOXICITY	IRRITATION
Oral (rat) LD50: 355 mg/kg[2]	Eye (rabbit):100 mg/24h - moderate
	Skin (rabbit): 500 mg/24h - mild

boron

TOXICITY	IRRITATION
Oral (rat) LD50: 650 mg/kg[2]	Not Available

Continued...

cadmium

TOXICITY	IRRITATION
Inhalation (rat) LC50: 3.125E-6 mg/L/30m[2]	Not Available
Oral (rat) LD50: >63<259 mg/kg>[1]	

calcium

TOXICITY	IRRITATION
Dermal (rabbit) LD50: >2500 mg/kg[1]	Not Available
Oral (rat) LD50: >2000 mg/kg[1]	

caesium

TOXICITY	IRRITATION
Not Available	Not Available

chromium

TOXICITY	IRRITATION
Not Available	Not Available

cobalt

TOXICITY	IRRITATION
dermal (rat) LD50: >2000 mg/kg[1]	Not Available
Oral (rat) LD50: 6170 mg/kg[2]	

copper

TOXICITY	IRRITATION
dermal (rat) LD50: >2000 mg/kg[1]	Not Available
Inhalation (rat) LC50: 0.733 mg/l4 h[1]	
Oral (rat) LD50: 300-500 mg/kg[1]	

gallium

TOXICITY	IRRITATION
Not Available	Not Available

indium

TOXICITY	IRRITATION
Not Available	Not Available

iron

TOXICITY	IRRITATION
Oral (rat) LD50: 98600 mg/kg[2]	Not Available

lead

TOXICITY	IRRITATION
dermal (rat) LD50: >2000 mg/kg[1]	Not Available
Inhalation (rat) LC50: >5.05 mg/l4 h[1]	
Oral (rat) LD50: >2000 mg/kg[1]	

lithium

TOXICITY	IRRITATION
Not Available	Not Available

magnesium

TOXICITY	IRRITATION
Oral (rat) LD50: >2000 mg/kg[1]	Not Available

manganese(II) acetate tetrahydrate

TOXICITY	IRRITATION
Oral (rat) LD50: 3730 mg/kg[2]	Not Available

nickel

TOXICITY	IRRITATION
Oral (rat) LD50: 5000 mg/kg[2]	Not Available

ammonium phosphate, monobasic

TOXICITY	IRRITATION

Continued...

	dermal (rat) LD50: >5000 mg/kg[1]	Not Available
	Oral (rat) LD50: >2000 mg/kg[1]	

potassium	TOXICITY	IRRITATION
	Not Available	Not Available

rubidium	TOXICITY	IRRITATION
	Not Available	Not Available

silver	TOXICITY	IRRITATION
	Oral (rat) LD50: >2000 mg/kg[1]	Not Available

sodium	TOXICITY	IRRITATION
	Not Available	Not Available

strontium	TOXICITY	IRRITATION
	Not Available	Not Available

thallium	TOXICITY	IRRITATION
	Not Available	Not Available

uranyl nitrate	TOXICITY	IRRITATION
	dermal (rat) LD50: 1040 mg/kg[2]	Not Available

ammonium metavanadate	TOXICITY	IRRITATION
	dermal (rat) LD50: 2102 mg/kg[2]	Not Available
	Inhalation (rat) LC50: 7.8E-9 mg/L/4H[2]	
	Oral (rat) LD50: 160 mg/kg[2]	

zinc	TOXICITY	IRRITATION
	Dermal (rabbit) LD50: 1130 mg/kg[2]	Not Available
	Oral (rat) LD50: >2000 mg/kg[1]	

nitric acid	TOXICITY	IRRITATION
	Inhalation (rat) LC50: 0.00013 mg/L/4h[2]	Not Available

water	TOXICITY	IRRITATION
	Not Available	Not Available

Legend:	*1. Value obtained from Europe ECHA Registered Substances - Acute toxicity 2.* Value obtained from manufacturer's SDS. Unless otherwise specified data extracted from RTECS - Register of Toxic Effect of chemical Substances*

BARIUM NITRATE	The material may produce moderate eye irritation leading to inflammation.
BORON	Elemental boron produces lower foetal body weight in rats.
CALCIUM	The solid may react violently on contact with wet skin tissue, i.e. eyes, mouth, causing chemical and thermal burns. The acute effects include burns, ulceration, or tissue death, severe eye damage (corneal burns or opacification), and probable blindness. Inhalation of dust or fumes (especially from a fire involving calcium) will cause shortness of breath, nausea, headache, nose and respiratory tract irritation and in extreme, pneumonitis
CHROMIUM	On skin and inhalation exposure, chromium and its compounds (except hexavalent) can be a potent sensitiser, as particulates. The substance is classified by IARC as Group 3: **NOT** classifiable as to its carcinogenicity to humans. Tenth Annual Report on Carcinogens: Substance known to be Carcinogenic [*National Toxicology Program: U.S. Dep.* Gastrointestinal tumours, lymphoma, musculoskeletal tumours and tumours at site of application recorded.
COBALT	Allergic reactions involving the respiratory tract are usually due to interactions between IgE antibodies and allergens and occur rapidly. Attention should be paid to atopic diathesis, characterised by increased susceptibility to nasal inflammation, asthma and eczema. Exogenous allergic alveolitis is induced essentially by allergen specific immune-complexes of the IgG type; cell-mediated reactions (T lymphocytes) may be involved.

Continued...

COPPER	for copper and its compounds (typically copper chloride): **Acute toxicity:** There are no reliable acute oral toxicity results available. WARNING: Inhalation of high concentrations of copper fume may cause "metal fume fever", an acute industrial disease of short duration. tiredness, influenza like respiratory tract irritation with fever.
GALLIUM	Substance has been investigated as a mutagen by DNA inhibition in human lymphocytes.
LEAD	WARNING: Lead is a cumulative poison and has the potential to cause abortion and intellectual impairment to unborn children of pregnant workers.
NICKEL	Tenth Annual Report on Carcinogens: Substance anticipated to be Carcinogen [*National Toxicology Program: U.S. Dep.* Oral (rat) TDLo: 500 mg/kg/5D-I Inhalation (rat) TCLo: 0.1 mg/m3/24H/17W-C
THALLIUM	Structural changes in nerves and sheath, changes in extraocular muscles, hair loss recorded
URANYL NITRATE	US NRCP Permissible quarterly intakes of radionuclides for occupational Insolubles- 3.2 microcuries per quarter oral intake; critical organ being the GI tract Lower large intestine. 4.0 x 10^-2 per quarter inhalation; critical organ being the lungs. Solubles- 1.2 microcuries per quarter oral intake; critical organ being the kidneys. 4.5 x 10^-2 per quarter inhalation; critical organ being the kidneys.
NITRIC ACID	The material may produce severe irritation to the eye causing pronounced inflammation. The material may produce respiratory tract irritation, and result in damage to the lung including reduced lung function. The material may cause severe skin irritation after prolonged or repeated exposure and may produce on contact skin redness, swelling, the production of vesicles, scaling and thickening of the skin. Oral (?) LD50: 50-500 mg/kg * [Various Manufacturers]
ICP-AM-MISA6 & NITRIC ACID	For acid mists, aerosols, vapours Test results suggest that eukaryotic cells are susceptible to genetic damage when the pH falls to about 6.5.
ICP-AM-MISA6 & BORON & CALCIUM & CAESIUM & GALLIUM & LITHIUM & MANGANESE(II) ACETATE TETRAHYDRATE & AMMONIUM PHOSPHATE, MONOBASIC & POTASSIUM & RUBIDIUM & SODIUM & AMMONIUM METAVANADATE & NITRIC ACID	Asthma-like symptoms may continue for months or even years after exposure to the material ends.
ALUMINIUM & CALCIUM & CHROMIUM & GALLIUM & INDIUM & LITHIUM & AMMONIUM PHOSPHATE, MONOBASIC & POTASSIUM & SODIUM & STRONTIUM & URANYL NITRATE & WATER	No significant acute toxicological data identified in literature search.
BARIUM NITRATE & ZINC	The material may cause skin irritation after prolonged or repeated exposure and may produce on contact skin redness, swelling, the production of vesicles, scaling and thickening of the skin.
COBALT & NICKEL	The following information refers to contact allergens as a group and may not be specific to this product.
COBALT & NICKEL	**WARNING:** This substance has been classified by the IARC as Group 2B: Possibly Carcinogenic to Humans.

Acute Toxicity	⊘	**Carcinogenicity**	⊘
Skin Irritation/Corrosion	✔	**Reproductivity**	⊘
Serious Eye Damage/Irritation	⊘	**STOT - Single Exposure**	⊘
Respiratory or Skin sensitisation	⊘	**STOT - Repeated Exposure**	⊘
Mutagenicity	⊘	**Aspiration Hazard**	⊘

Legend: ✘ *– Data available but does not fill the criteria for classification*
✔ *– Data available to make classification*
⊘ *– Data Not Available to make classification*

SECTION 12 ECOLOGICAL INFORMATION

Toxicity

ICP-AM-MISA6

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
Not Available	Not Available	Not Available	Not Available	Not Available

aluminium

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
LC50	96	Fish	0.078-0.108mg/L	2
EC50	48	Crustacea	0.7364mg/L	2
EC50	96	Algae or other aquatic plants	0.0054mg/L	2
BCF	360	Algae or other aquatic plants	9mg/L	4
NOEC	72	Algae or other aquatic plants	>=0.004mg/L	2

Continued...

barium nitrate

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
LC50	96	Fish	>3.5mg/L	2
EC50	72	Algae or other aquatic plants	>1.92mg/L	2
NOEC	72	Algae or other aquatic plants	>=1.92mg/L	2

boron

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
LC50	96	Fish	74mg/L	2
EC50	48	Crustacea	230mg/L	5
EC50	72	Algae or other aquatic plants	54mg/L	2
BCF	336	Algae or other aquatic plants	8.5mg/L	4
NOEC	576	Fish	0.001mg/L	5

cadmium

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
LC50	96	Fish	0.001mg/L	4
EC50	48	Crustacea	0.0033mg/L	5
EC50	72	Algae or other aquatic plants	0.018mg/L	2
BCF	960	Fish	500mg/L	4
NOEC	168	Fish	0.00001821mg/L	4

calcium

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
NOEC	48	Crustacea	33.3mg/L	2

caesium

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
Not Available	Not Available	Not Available	Not Available	Not Available

chromium

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
LC50	96	Fish	13.9mg/L	4
EC50	48	Crustacea	0.0225mg/L	5
EC50	72	Algae or other aquatic plants	0.104mg/L	4
BCF	1440	Algae or other aquatic plants	0.0495mg/L	4
NOEC	672	Fish	0.00019mg/L	4

cobalt

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
LC50	96	Fish	1.406mg/L	2
EC50	48	Crustacea	>0.89mg/L	2
EC50	72	Algae or other aquatic plants	0.144mg/L	2
BCF	1344	Fish	0.99mg/L	4
NOEC	168	Algae or other aquatic plants	0.0018mg/L	2

copper

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
LC50	96	Fish	0.0028mg/L	2
EC50	48	Crustacea	0.001mg/L	5
EC50	72	Algae or other aquatic plants	0.013335mg/L	4
BCF	960	Fish	200mg/L	4
EC25	6	Algae or other aquatic plants	0.00150495mg/L	4
NOEC	96	Crustacea	0.0008mg/L	4

gallium

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
Not Available	Not Available	Not Available	Not Available	Not Available

indium

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
Not Available	Not Available	Not Available	Not Available	Not Available

iron

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE

Continued...

	LC50	96	Fish	0.05mg/L	2
	EC50	96	Algae or other aquatic plants	3.7mg/L	4
	BCF	24	Crustacea	0.0000002mg/L	4
	NOEC	504	Fish	0.52mg/L	2

lead

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
LC50	96	Fish	0.0079mg/L	2
EC50	48	Crustacea	0.029mg/L	2
EC50	72	Algae or other aquatic plants	0.0205mg/L	2
BCFD	8	Fish	4.324mg/L	4
NOEC	672	Fish	0.00003mg/L	4

lithium

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
NOEC	816	Fish	2.87mg/L	2

magnesium

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
LC50	96	Fish	541mg/L	2
EC50	72	Algae or other aquatic plants	>20mg/L	2
NOEC	72	Algae or other aquatic plants	>25.5mg/L	2

manganese(II) acetate tetrahydrate

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
Not Available	Not Available	Not Available	Not Available	Not Available

nickel

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
LC50	96	Fish	0.0000475mg/L	4
EC50	48	Crustacea	0.013mg/L	5
EC50	72	Algae or other aquatic plants	0.0407mg/L	2
BCF	1440	Algae or other aquatic plants	0.47mg/L	4
NOEC	72	Algae or other aquatic plants	0.0035mg/L	2

ammonium phosphate, monobasic

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
LC50	96	Fish	>85.9mg/L	2
EC50	72	Algae or other aquatic plants	>97.1mg/L	2
NOEC	72	Algae or other aquatic plants	3.57mg/L	2

potassium

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
Not Available	Not Available	Not Available	Not Available	Not Available

rubidium

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
Not Available	Not Available	Not Available	Not Available	Not Available

silver

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
LC50	96	Fish	0.00148mg/L	2
EC50	48	Crustacea	0.00024mg/L	4
EC50	96	Algae or other aquatic plants	0.001628837mg/L	4
BCF	336	Crustacea	0.02mg/L	4
NOEC	480	Crustacea	0.00031mg/L	2

sodium

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
EC50	48	Crustacea	1640mg/L	4

strontium

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
Not Available	Not Available	Not Available	Not Available	Not Available

Continued...

thallium

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
LC50	96	Fish	21mg/L	4
EC50	96	Algae or other aquatic plants	0.13mg/L	4
NOEC	720	Fish	0.04mg/L	5

uranyl nitrate

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
LC50	96	Fish	3.1mg/L	4
EC50	48	Crustacea	5.34mg/L	4
BCF	144	Fish	0.963mg/L	4
NOEC	480	Algae or other aquatic plants	0.5mg/L	4

ammonium metavanadate

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
LC50	96	Fish	0.693mg/L	2
EC50	48	Crustacea	2.387mg/L	2
EC50	72	Algae or other aquatic plants	0.9894mg/L	2
NOEC	72	Algae or other aquatic plants	0.0168mg/L	2

zinc

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
LC50	96	Fish	0.00272mg/L	4
EC50	48	Crustacea	0.04mg/L	5
EC50	72	Algae or other aquatic plants	0.106mg/L	4
BCF	360	Algae or other aquatic plants	9mg/L	4
NOEC	336	Algae or other aquatic plants	0.00075mg/L	4

nitric acid

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
NOEC	16	Crustacea	107mg/L	4

water

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
Not Available	Not Available	Not Available	Not Available	Not Available

Legend: *Extracted from 1. IUCLID Toxicity Data 2. Europe ECHA Registered Substances - Ecotoxicological Information - Aquatic Toxicity 3. EPIWIN Suite V3.12 (QSAR) - Aquatic Toxicity Data (Estimated) 4. US EPA, Ecotox database - Aquatic Toxicity Data 5. ECETOC Aquatic Hazard Assessment Data 6. NITE (Japan) - Bioconcentration Data 7. METI (Japan) - Bioconcentration Data 8. Vendor Data*

Ecotoxicity:
The tolerance of water organisms towards pH margin and variation is diverse.
For Vanadium Compounds:
Environmental Fate: Vanadium is travels through the environment via long-range transportation in the atmosphere, water, and land by natural and man-made sources, wet and dry deposition, adsorption and complexing.
DO NOT discharge into sewer or waterways.

Persistence and degradability

Ingredient	Persistence: Water/Soil	Persistence: Air
ammonium phosphate, monobasic	HIGH	HIGH
ammonium metavanadate	HIGH	HIGH
water	LOW	LOW

Bioaccumulative potential

Ingredient	Bioaccumulation
ammonium phosphate, monobasic	LOW (LogKOW = -0.7699)
ammonium metavanadate	LOW (LogKOW = 2.229)
water	LOW (LogKOW = -1.38)

Mobility in soil

Ingredient	Mobility
ammonium phosphate, monobasic	HIGH (KOC = 1)
ammonium metavanadate	LOW (KOC = 35.04)
water	LOW (KOC = 14.3)

Continued...

SECTION 13 DISPOSAL CONSIDERATIONS

Waste treatment methods

Product / Packaging disposal	▸ Containers may still present a chemical hazard/ danger when empty. ▸ WARNING Radioactive materials must not be disposed of as Industrial Waste or domestic garbage.

SECTION 14 TRANSPORT INFORMATION

Labels Required

	
Marine Pollutant	NO

Land transport (DOT)

UN number	3264
UN proper shipping name	Corrosive liquid, acidic, inorganic, n.o.s.
Transport hazard class(es)	Class: 8 Subrisk: Not Applicable
Packing group	II
Environmental hazard	Not Applicable
Special precautions for user	Hazard Label: 8 Special provisions: 386, B2, IB2, T11, TP2, TP27

Air transport (ICAO-IATA / DGR)

UN number	3264
UN proper shipping name	Corrosive liquid, acidic, inorganic, n.o.s. *
Transport hazard class(es)	ICAO/IATA Class: 8 ICAO / IATA Subrisk: Not Applicable ERG Code: 8L
Packing group	II
Environmental hazard	Not Applicable
Special precautions for user	Special provisions: A3 A803 Cargo Only Packing Instructions: 855 Cargo Only Maximum Qty / Pack: 30 L Passenger and Cargo Packing Instructions: 851 Passenger and Cargo Maximum Qty / Pack: 1 L Passenger and Cargo Limited Quantity Packing Instructions: Y840 Passenger and Cargo Limited Maximum Qty / Pack: 0.5 L

Sea transport (IMDG-Code / GGVSee)

UN number	3264
UN proper shipping name	CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.
Transport hazard class(es)	IMDG Class: 8 IMDG Subrisk: Not Applicable
Packing group	II
Environmental hazard	Not Applicable
Special precautions for user	EMS Number: F-A , S-B Special provisions: 274 Limited Quantities: 1 L

Continued...

Transport in bulk according to Annex II of MARPOL and the IBC code

Source	Product name	Pollution Category	Ship Type
IMO MARPOL (Annex II) - List of Noxious Liquid Substances Carried in Bulk	Nitric acid (70% and over)|Nitric acid (less than 70%)	Y; Y	2|2

SECTION 15 REGULATORY INFORMATION

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

ALUMINIUM(7429-90-5) IS FOUND ON THE FOLLOWING REGULATORY LISTS

US - Alaska Limits for Air Contaminants
US - California Permissible Exposure Limits for Chemical Contaminants
US - Hawaii Air Contaminant Limits
US - Massachusetts - Right To Know Listed Chemicals
US - Michigan Exposure Limits for Air Contaminants
US - Minnesota Permissible Exposure Limits (PELs)
US - Oregon Permissible Exposure Limits (Z-1)
US - Pennsylvania - Hazardous Substance List
US - Rhode Island Hazardous Substance List
US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants
US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants
US - Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants
US - Washington Permissible exposure limits of air contaminants
US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants
US ACGIH Threshold Limit Values (TLV)
US ACGIH Threshold Limit Values (TLV) - Carcinogens
US ATSDR Minimal Risk Levels for Hazardous Substances (MRLs)
US EPCRA Section 313 Chemical List
US NIOSH Recommended Exposure Limits (RELs)
US OSHA Permissible Exposure Levels (PELs) - Table Z1
US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory

BARIUM NITRATE(10022-31-8) IS FOUND ON THE FOLLOWING REGULATORY LISTS

US - Alaska Limits for Air Contaminants
US - California Permissible Exposure Limits for Chemical Contaminants
US - Hawaii Air Contaminant Limits
US - Idaho - Limits for Air Contaminants
US - Massachusetts - Right To Know Listed Chemicals
US - Michigan Exposure Limits for Air Contaminants
US - Minnesota Permissible Exposure Limits (PELs)
US - Oregon Permissible Exposure Limits (Z-1)
US - Pennsylvania - Hazardous Substance List
US - Rhode Island Hazardous Substance List
US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants
US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants
US - Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants
US - Washington Permissible exposure limits of air contaminants
US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants
US ACGIH Threshold Limit Values (TLV)
US ACGIH Threshold Limit Values (TLV) - Carcinogens
US ATSDR Minimal Risk Levels for Hazardous Substances (MRLs)
US EPA Carcinogens Listing
US EPCRA Section 313 Chemical List
US NIOSH Recommended Exposure Limits (RELs)
US OSHA Permissible Exposure Levels (PELs) - Table Z1
US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory

BORON(7440-42-8) IS FOUND ON THE FOLLOWING REGULATORY LISTS

International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
US - California OEHHA/ARB - Chronic Reference Exposure Levels and Target Organs (CRELs)
US - California Permissible Exposure Limits for Chemical Contaminants
US - Hawaii Air Contaminant Limits
US - Michigan Exposure Limits for Air Contaminants
US - Oregon Permissible Exposure Limits (Z-1)
US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants
US - Washington Permissible exposure limits of air contaminants
US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants
US ATSDR Minimal Risk Levels for Hazardous Substances (MRLs)
US EPA Carcinogens Listing
US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory

CADMIUM(7440-43-9) IS FOUND ON THE FOLLOWING REGULATORY LISTS

International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
US - Alaska Limits for Air Contaminants
US - California - Proposition 65 - Priority List for the Development of MADLs for Chemicals Causing Reproductive Toxicity
US - California OEHHA/ARB - Chronic Reference Exposure Levels and Target Organs (CRELs)
US - California Permissible Exposure Limits for Chemical Contaminants
US - California Proposition 65 - Carcinogens
US - California Proposition 65 - Maximum Allowable Dose Levels (MADLs) for Chemicals Causing Reproductive Toxicity
US - California Proposition 65 - No Significant Risk Levels (NSRLs) for Carcinogens
US - California Proposition 65 - Reproductive Toxicity
US - Hawaii Air Contaminant Limits
US - Idaho - Acceptable Maximum Peak Concentrations
US - Idaho - Limits for Air Contaminants
US - Massachusetts - Right To Know Listed Chemicals
US - Michigan Exposure Limits for Air Contaminants
US - Minnesota Permissible Exposure Limits (PELs)
US - New Jersey Right to Know - Special Health Hazard Substance List (SHHSL): Carcinogens
US - Oregon Permissible Exposure Limits (Z-1)
US - Oregon Permissible Exposure Limits (Z-2)
US - Pennsylvania - Hazardous Substance List
US - Rhode Island Hazardous Substance List
US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants
US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants
US - Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants
US - Washington Permissible exposure limits of air contaminants
US - Washington Toxic air pollutants and their ASIL, SQER and de minimis emission values
US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants
US - Wyoming Toxic and Hazardous Substances Table Z-2 Acceptable ceiling concentration, Acceptable maximum peak above the acceptable ceiling concentration for an 8-hr shift
US ACGIH Threshold Limit Values (TLV)
US ACGIH Threshold Limit Values (TLV) - Carcinogens
US ATSDR Minimal Risk Levels for Hazardous Substances (MRLs)
US Clean Air Act - Hazardous Air Pollutants
US CWA (Clean Water Act) - Priority Pollutants
US CWA (Clean Water Act) - Toxic Pollutants
US EPA Carcinogens Listing
US EPCRA Section 313 Chemical List
US National Toxicology Program (NTP) 14th Report Part A Known to be Human Carcinogens
US NIOSH Recommended Exposure Limits (RELs)
US Office of Environmental Health Hazard Assessment Proposition 65 No Significant Risk Levels (NSRLs) for Carcinogens and Maximum Allowable Dose Levels (MADLs) for Chemicals Causing Reproductive Toxicity
US OSHA Carcinogens Listing
US OSHA Permissible Exposure Levels (PELs) - Table Z1
US OSHA Permissible Exposure Levels (PELs) - Table Z2
US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory

CALCIUM(7440-70-2) IS FOUND ON THE FOLLOWING REGULATORY LISTS

Continued...

US - Massachusetts - Right To Know Listed Chemicals
US - Pennsylvania - Hazardous Substance List
US - Rhode Island Hazardous Substance List
US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory

CAESIUM(7440-46-2) IS FOUND ON THE FOLLOWING REGULATORY LISTS

International Air Transport Association (IATA) Dangerous Goods Regulations - Prohibited List Passenger and Cargo Aircraft
US ATSDR Minimal Risk Levels for Hazardous Substances (MRLs)
US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory

CHROMIUM(7440-47-3) IS FOUND ON THE FOLLOWING REGULATORY LISTS

International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
US - Alaska Limits for Air Contaminants
US - California Permissible Exposure Limits for Chemical Contaminants
US - Hawaii Air Contaminant Limits
US - Idaho - Limits for Air Contaminants
US - Massachusetts - Right To Know Listed Chemicals
US - Michigan Exposure Limits for Air Contaminants
US - Oregon Permissible Exposure Limits (Z-1)
US - Pennsylvania - Hazardous Substance List
US - Rhode Island Hazardous Substance List
US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants
US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants
US - Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants
US - Washington Permissible exposure limits of air contaminants
US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants
US ACGIH Threshold Limit Values (TLV)
US ACGIH Threshold Limit Values (TLV) - Carcinogens
US ACGIH Threshold Limit Values (TLV) - Notice of Intended Changes
US Clean Air Act - Hazardous Air Pollutants
US CWA (Clean Water Act) - Priority Pollutants
US CWA (Clean Water Act) - Toxic Pollutants
US EPCRA Section 313 Chemical List
US NIOSH Recommended Exposure Limits (RELs)
US OSHA Permissible Exposure Levels (PELs) - Table Z1
US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory

COBALT(7440-48-4) IS FOUND ON THE FOLLOWING REGULATORY LISTS

International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
US - Alaska Limits for Air Contaminants
US - California Permissible Exposure Limits for Chemical Contaminants
US - California Proposition 65 - Carcinogens
US - Hawaii Air Contaminant Limits
US - Idaho - Limits for Air Contaminants
US - Massachusetts - Right To Know Listed Chemicals
US - Michigan Exposure Limits for Air Contaminants
US - Minnesota Permissible Exposure Limits (PELs)
US - New Jersey Right to Know - Special Health Hazard Substance List (SHHSL): Carcinogens
US - Oregon Permissible Exposure Limits (Z-1)
US - Pennsylvania - Hazardous Substance List
US - Rhode Island Hazardous Substance List
US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants
US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants
US - Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants
US - Washington Permissible exposure limits of air contaminants
US - Washington Toxic air pollutants and their ASIL, SQER and de minimis emission values
US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants
US ACGIH Threshold Limit Values (TLV)
US ACGIH Threshold Limit Values (TLV) - Carcinogens
US ACGIH Threshold Limit Values (TLV) - Notice of Intended Changes
US ATSDR Minimal Risk Levels for Hazardous Substances (MRLs)
US Clean Air Act - Hazardous Air Pollutants
US EPCRA Section 313 Chemical List
US National Toxicology Program (NTP) 14th Report Part B.
US NIOSH Recommended Exposure Limits (RELs)
US OSHA Permissible Exposure Levels (PELs) - Table Z1
US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory

COPPER(7440-50-8) IS FOUND ON THE FOLLOWING REGULATORY LISTS

US - Alaska Limits for Air Contaminants
US - California OEHHA/ARB - Acute Reference Exposure Levels and Target Organs (RELs)
US - California Permissible Exposure Limits for Chemical Contaminants
US - Hawaii Air Contaminant Limits
US - Idaho - Limits for Air Contaminants
US - Massachusetts - Right To Know Listed Chemicals
US - Michigan Exposure Limits for Air Contaminants
US - Minnesota Permissible Exposure Limits (PELs)
US - Oregon Permissible Exposure Limits (Z-1)
US - Pennsylvania - Hazardous Substance List
US - Rhode Island Hazardous Substance List
US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants
US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants
US - Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants
US - Washington Permissible exposure limits of air contaminants
US - Washington Toxic air pollutants and their ASIL, SQER and de minimis emission values
US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants
US ACGIH Threshold Limit Values (TLV)
US ATSDR Minimal Risk Levels for Hazardous Substances (MRLs)
US CWA (Clean Water Act) - Priority Pollutants
US CWA (Clean Water Act) - Toxic Pollutants
US EPA Carcinogens Listing
US EPCRA Section 313 Chemical List
US NIOSH Recommended Exposure Limits (RELs)
US OSHA Permissible Exposure Levels (PELs) - Table Z1
US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory

GALLIUM(7440-55-3) IS FOUND ON THE FOLLOWING REGULATORY LISTS

US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory

INDIUM(7440-74-6) IS FOUND ON THE FOLLOWING REGULATORY LISTS

International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
US - Alaska Limits for Air Contaminants
US - California OEHHA/ARB - Chronic Reference Exposure Levels and Target Organs (CRELs)
US - California Permissible Exposure Limits for Chemical Contaminants
US - Hawaii Air Contaminant Limits
US - Massachusetts - Right To Know Listed Chemicals
US - Michigan Exposure Limits for Air Contaminants
US - Minnesota Permissible Exposure Limits (PELs)
US - Oregon Permissible Exposure Limits (Z-1)
US - Pennsylvania - Hazardous Substance List
US - Rhode Island Hazardous Substance List
US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants
US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants
US - Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants
US - Washington Permissible exposure limits of air contaminants
US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants
US ACGIH Threshold Limit Values (TLV)
US NIOSH Recommended Exposure Limits (RELs)
US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory

IRON(7439-89-6) IS FOUND ON THE FOLLOWING REGULATORY LISTS

Continued...

US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory

LEAD(7439-92-1) IS FOUND ON THE FOLLOWING REGULATORY LISTS

International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
US - Alaska Limits for Air Contaminants
US - California - Proposition 65 - Priority List for the Development of MADLs for Chemicals Causing Reproductive Toxicity
US - California Permissible Exposure Limits for Chemical Contaminants
US - California Proposition 65 - Carcinogens
US - California Proposition 65 - Maximum Allowable Dose Levels (MADLs) for Chemicals Causing Reproductive Toxicity
US - California Proposition 65 - No Significant Risk Levels (NSRLs) for Carcinogens
US - California Proposition 65 - Reproductive Toxicity
US - Hawaii Air Contaminant Limits
US - Idaho - Acceptable Maximum Peak Concentrations
US - Idaho - Limits for Air Contaminants
US - Massachusetts - Right To Know Listed Chemicals
US - Minnesota Permissible Exposure Limits (PELs)
US - New Jersey Right to Know - Special Health Hazard Substance List (SHHSL): Carcinogens
US - Pennsylvania - Hazardous Substance List
US - Rhode Island Hazardous Substance List
US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants
US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants
US - Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants
US - Washington Permissible exposure limits of air contaminants
US - Washington Toxic air pollutants and their ASIL, SQER and de minimis emission values
US ACGIH Threshold Limit Values (TLV)
US ACGIH Threshold Limit Values (TLV) - Carcinogens
US Clean Air Act - Hazardous Air Pollutants
US CWA (Clean Water Act) - Priority Pollutants
US CWA (Clean Water Act) - Toxic Pollutants
US EPA Carcinogens Listing
US EPCRA Section 313 Chemical List
US National Toxicology Program (NTP) 14th Report Part B.
US NIOSH Recommended Exposure Limits (RELs)
US Office of Environmental Health Hazard Assessment Proposition 65 No Significant Risk Levels (NSRLs) for Carcinogens and Maximum Allowable Dose Levels (MADLs) for Chemicals Causing Reproductive Toxicity
US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory

LITHIUM(7439-93-2) IS FOUND ON THE FOLLOWING REGULATORY LISTS

International Air Transport Association (IATA) Dangerous Goods Regulations - Prohibited List Passenger and Cargo Aircraft
US - Massachusetts - Right To Know Listed Chemicals
US - Pennsylvania - Hazardous Substance List
US - Rhode Island Hazardous Substance List
US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory

MAGNESIUM(7439-95-4) IS FOUND ON THE FOLLOWING REGULATORY LISTS

International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
US - California OEHHA/ARB - Chronic Reference Exposure Levels and Target Organs (CRELs)
US - California Permissible Exposure Limits for Chemical Contaminants
US - Hawaii Air Contaminant Limits
US - Massachusetts - Right To Know Listed Chemicals
US - Michigan Exposure Limits for Air Contaminants
US - Oregon Permissible Exposure Limits (Z-1)
US - Pennsylvania - Hazardous Substance List
US - Rhode Island Hazardous Substance List
US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants
US - Washington Permissible exposure limits of air contaminants
US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants
US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory

MANGANESE(II) ACETATE TETRAHYDRATE(6156-78-1) IS FOUND ON THE FOLLOWING REGULATORY LISTS

US - Alaska Limits for Air Contaminants
US - California OEHHA/ARB - Chronic Reference Exposure Levels and Target Organs (CRELs)
US - California Permissible Exposure Limits for Chemical Contaminants
US - Hawaii Air Contaminant Limits
US - Idaho - Limits for Air Contaminants
US - Michigan Exposure Limits for Air Contaminants
US - Minnesota Permissible Exposure Limits (PELs)
US - Oregon Permissible Exposure Limits (Z-1)
US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants
US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants
US - Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants
US - Washington Permissible exposure limits of air contaminants
US - Washington Toxic air pollutants and their ASIL, SQER and de minimis emission values
US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants
US Clean Air Act - Hazardous Air Pollutants
US EPCRA Section 313 Chemical List
US OSHA Permissible Exposure Levels (PELs) - Table Z1
US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory

NICKEL(7440-02-0) IS FOUND ON THE FOLLOWING REGULATORY LISTS

US - Alaska Limits for Air Contaminants
US - California OEHHA/ARB - Acute Reference Exposure Levels and Target Organs (RELs)
US - California OEHHA/ARB - Chronic Reference Exposure Levels and Target Organs (CRELs)
US - California Permissible Exposure Limits for Chemical Contaminants
US - California Proposition 65 - Carcinogens
US - Hawaii Air Contaminant Limits
US - Idaho - Limits for Air Contaminants
US - Massachusetts - Right To Know Listed Chemicals
US - Michigan Exposure Limits for Air Contaminants
US - Minnesota Permissible Exposure Limits (PELs)
US - New Jersey Right to Know - Special Health Hazard Substance List (SHHSL): Carcinogens
US - Oregon Permissible Exposure Limits (Z-1)
US - Pennsylvania - Hazardous Substance List
US - Rhode Island Hazardous Substance List
US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants
US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants
US - Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants
US - Washington Permissible exposure limits of air contaminants
US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants
US ACGIH Threshold Limit Values (TLV)
US ACGIH Threshold Limit Values (TLV) - Carcinogens
US ATSDR Minimal Risk Levels for Hazardous Substances (MRLs)
US Clean Air Act - Hazardous Air Pollutants
US CWA (Clean Water Act) - Priority Pollutants
US CWA (Clean Water Act) - Toxic Pollutants
US EPCRA Section 313 Chemical List
US National Toxicology Program (NTP) 14th Report Part B.
US NIOSH Recommended Exposure Limits (RELs)
US Office of Environmental Health Hazard Assessment Proposition 65 No Significant Risk Levels (NSRLs) for Carcinogens and Maximum Allowable Dose Levels (MADLs) for Chemicals Causing Reproductive Toxicity
US OSHA Permissible Exposure Levels (PELs) - Table Z1
US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory

AMMONIUM PHOSPHATE, MONOBASIC(7722-76-1) IS FOUND ON THE FOLLOWING REGULATORY LISTS

US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory

POTASSIUM(7440-09-7) IS FOUND ON THE FOLLOWING REGULATORY LISTS

Continued...

International Air Transport Association (IATA) Dangerous Goods Regulations - Prohibited List Passenger and Cargo Aircraft
US - Massachusetts - Right To Know Listed Chemicals
US - Pennsylvania - Hazardous Substance List
US - Rhode Island Hazardous Substance List
US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory

RUBIDIUM(7440-17-7) IS FOUND ON THE FOLLOWING REGULATORY LISTS

International Air Transport Association (IATA) Dangerous Goods Regulations - Prohibited List Passenger and Cargo Aircraft
US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory

SILVER(7440-22-4) IS FOUND ON THE FOLLOWING REGULATORY LISTS

US - Alaska Limits for Air Contaminants
US - California Permissible Exposure Limits for Chemical Contaminants
US - Hawaii Air Contaminant Limits
US - Idaho - Limits for Air Contaminants
US - Massachusetts - Right To Know Listed Chemicals
US - Michigan Exposure Limits for Air Contaminants
US - Minnesota Permissible Exposure Limits (PELs)
US - Oregon Permissible Exposure Limits (Z-1)
US - Pennsylvania - Hazardous Substance List
US - Rhode Island Hazardous Substance List
US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants
US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants
US - Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants
US - Washington Permissible exposure limits of air contaminants
US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants
US ACGIH Threshold Limit Values (TLV)
US CWA (Clean Water Act) - Priority Pollutants
US CWA (Clean Water Act) - Toxic Pollutants
US EPA Carcinogens Listing
US EPCRA Section 313 Chemical List
US NIOSH Recommended Exposure Limits (RELs)
US OSHA Permissible Exposure Levels (PELs) - Table Z1
US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory

SODIUM(7440-23-5) IS FOUND ON THE FOLLOWING REGULATORY LISTS

International Air Transport Association (IATA) Dangerous Goods Regulations - Prohibited List Passenger and Cargo Aircraft
US - Massachusetts - Right To Know Listed Chemicals
US - Pennsylvania - Hazardous Substance List
US - Rhode Island Hazardous Substance List
US CWA (Clean Water Act) - List of Hazardous Substances
US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory

STRONTIUM(7440-24-6) IS FOUND ON THE FOLLOWING REGULATORY LISTS

US ATSDR Minimal Risk Levels for Hazardous Substances (MRLs)
US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory

THALLIUM(7440-28-0) IS FOUND ON THE FOLLOWING REGULATORY LISTS

US - Massachusetts - Right To Know Listed Chemicals
US - Minnesota Permissible Exposure Limits (PELs)
US - Pennsylvania - Hazardous Substance List
US - Rhode Island Hazardous Substance List
US ACGIH Threshold Limit Values (TLV)
US CWA (Clean Water Act) - Priority Pollutants
US CWA (Clean Water Act) - Toxic Pollutants
US EPCRA Section 313 Chemical List
US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory

URANYL NITRATE(10102-06-4) IS FOUND ON THE FOLLOWING REGULATORY LISTS

US - Alaska Limits for Air Contaminants
US - California Permissible Exposure Limits for Chemical Contaminants
US - Hawaii Air Contaminant Limits
US - Idaho - Limits for Air Contaminants
US - Massachusetts - Right To Know Listed Chemicals
US - Michigan Exposure Limits for Air Contaminants
US - Minnesota Permissible Exposure Limits (PELs)
US - Oregon Permissible Exposure Limits (Z-1)
US - Pennsylvania - Hazardous Substance List
US - Rhode Island Hazardous Substance List
US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants
US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants
US - Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants
US - Washington Permissible exposure limits of air contaminants
US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants
US ACGIH Threshold Limit Values (TLV)
US ACGIH Threshold Limit Values (TLV) - Carcinogens
US ATSDR Minimal Risk Levels for Hazardous Substances (MRLs)
US CWA (Clean Water Act) - List of Hazardous Substances
US NIOSH Recommended Exposure Limits (RELs)
US OSHA Permissible Exposure Levels (PELs) - Table Z1
US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory

AMMONIUM METAVANADATE(7803-55-6) IS FOUND ON THE FOLLOWING REGULATORY LISTS

US - California OEHHA/ARB - Acute Reference Exposure Levels and Target Organs (RELs)
US - Massachusetts - Right To Know Listed Chemicals
US - Pennsylvania - Hazardous Substance List
US EPCRA Section 313 Chemical List
US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory

ZINC(7440-66-6) IS FOUND ON THE FOLLOWING REGULATORY LISTS

International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
US - California OEHHA/ARB - Chronic Reference Exposure Levels and Target Organs (CRELs)
US - California Permissible Exposure Limits for Chemical Contaminants
US - Hawaii Air Contaminant Limits
US - Massachusetts - Right To Know Listed Chemicals
US - Michigan Exposure Limits for Air Contaminants
US - Oregon Permissible Exposure Limits (Z-1)
US - Pennsylvania - Hazardous Substance List
US - Rhode Island Hazardous Substance List
US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants
US - Washington Permissible exposure limits of air contaminants
US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants
US ATSDR Minimal Risk Levels for Hazardous Substances (MRLs)
US CWA (Clean Water Act) - Priority Pollutants
US CWA (Clean Water Act) - Toxic Pollutants
US EPA Carcinogens Listing
US EPCRA Section 313 Chemical List
US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory

NITRIC ACID(7697-37-2) IS FOUND ON THE FOLLOWING REGULATORY LISTS

Continued...

International Air Transport Association (IATA) Dangerous Goods Regulations - Prohibited List Passenger and Cargo Aircraft
US - Alaska Limits for Air Contaminants
US - California OEHHA/ARB - Acute Reference Exposure Levels and Target Organs (RELs)
US - California Permissible Exposure Limits for Chemical Contaminants
US - Hawaii Air Contaminant Limits
US - Idaho - Limits for Air Contaminants
US - Massachusetts - Right To Know Listed Chemicals
US - Michigan Exposure Limits for Air Contaminants
US - Minnesota Permissible Exposure Limits (PELs)
US - Oregon Permissible Exposure Limits (Z-1)
US - Pennsylvania - Hazardous Substance List
US - Rhode Island Hazardous Substance List
US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants
US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants
US - Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants
US - Washington Permissible exposure limits of air contaminants
US - Washington Toxic air pollutants and their ASIL, SQER and de minimis emission values
US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants
US ACGIH Threshold Limit Values (TLV)
US CWA (Clean Water Act) - List of Hazardous Substances
US EPCRA Section 313 Chemical List
US NIOSH Recommended Exposure Limits (RELs)
US OSHA Permissible Exposure Levels (PELs) - Table Z1
US SARA Section 302 Extremely Hazardous Substances
US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory

WATER(7732-18-5) IS FOUND ON THE FOLLOWING REGULATORY LISTS

US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory

Federal Regulations

Superfund Amendments and Reauthorization Act of 1986 (SARA)

SECTION 311/312 HAZARD CATEGORIES

Immediate (acute) health hazard	Yes
Delayed (chronic) health hazard	No
Fire hazard	No
Pressure hazard	No
Reactivity hazard	No

US. EPA CERCLA HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES (40 CFR 302.4)

Name	Reportable Quantity in Pounds (lb)	Reportable Quantity in kg
Cadmium	10	4.54
Chromium	5000	2270
Copper	5000	2270
Lead	10	4.54
Nickel	100	45.4
Silver	1000	454
Sodium	10	4.54
Thallium	1000	454
Uranyl nitrate	100	45.4
Ammonium vanadate	1000	454
Zinc	1000	454
Nitric acid	1000	454

State Regulations

US. CALIFORNIA PROPOSITION 65

WARNING: This product contains a chemical known to the State of California to cause cancer and birth defects or other reproductive harm

US - CALIFORNIA PREPOSITION 65 - CARCINOGENS & REPRODUCTIVE TOXICITY (CRT): LISTED SUBSTANCE

Cadmium and cadmium compounds: Cadmium, Cobalt metal powder, Lead and lead compounds: Lead, Nickel (Metallic) Listed

National Inventory	Status
Australia - AICS	Y
Canada - DSL	N (uranyl nitrate; caesium; rubidium)
Canada - NDSL	N (sodium; strontium; thallium; lead; calcium; zinc; indium; potassium; ammonium metavanadate; barium nitrate; magnesium; copper; boron; lithium; ammonium phosphate, monobasic; water; gallium; aluminium; cobalt; nickel; manganese(II) acetate tetrahydrate; iron; chromium; silver; cadmium; nitric acid)
China - IECSC	N (caesium; rubidium)
Europe - EINEC / ELINCS / NLP	Y
Japan - ENCS	N (sodium; strontium; thallium; lead; calcium; zinc; uranyl nitrate; indium; potassium; magnesium; copper; boron; lithium; ammonium phosphate, monobasic; gallium; aluminium; cobalt; nickel; manganese(II) acetate tetrahydrate; iron; caesium; chromium; silver; rubidium; cadmium; nitric acid)
Korea - KECI	N (uranyl nitrate)
New Zealand - NZIoC	N (caesium)
Philippines - PICCS	Y
USA - TSCA	Y
Legend:	*Y = All ingredients are on the inventory* *N = Not determined or one or more ingredients are not on the inventory and are not exempt from listing(see specific ingredients in brackets)*

Continued...

SECTION 16 OTHER INFORMATION

Other information

Ingredients with multiple cas numbers

Name	CAS No
aluminium	7429-90-5, 91728-14-2
barium nitrate	10022-31-8, 34053-87-7
calcium	7440-70-2, 8047-59-4
copper	7440-50-8, 133353-46-5, 133353-47-6, 195161-80-9, 65555-90-0, 72514-83-1
uranyl nitrate	10102-06-4, 13520-83-7, 36478-76-9

Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.
The SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment.

Definitions and abbreviations

PC—TWA: Permissible Concentration-Time Weighted Average
PC—STEL: Permissible Concentration-Short Term Exposure Limit
IARC: International Agency for Research on Cancer
ACGIH: American Conference of Governmental Industrial Hygienists
STEL: Short Term Exposure Limit
TEEL: Temporary Emergency Exposure Limit。
IDLH: Immediately Dangerous to Life or Health Concentrations
OSF: Odour Safety Factor
NOAEL :No Observed Adverse Effect Level
LOAEL: Lowest Observed Adverse Effect Level
TLV: Threshold Limit Value
LOD: Limit Of Detection
OTV: Odour Threshold Value
BCF: BioConcentration Factors
BEI: Biological Exposure Index

end of SDS