ICP-MS Quality Control Sample 2
Novachem Pty Ltd

Chemwatch Hazard Alert Code: **4**

Version No: **1.2**
Safety Data Sheet according to WHS and ADG requirements

Issue Date: **30/03/2021**
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SECTION 1 Identification of the substance / mixture and of the company / undertaking

Product Identifier

Product name	ICP-MS Quality Control Sample 2
Chemical Name	Not Applicable
Synonyms	ICP-MS-QC2-1
Proper shipping name	CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (Nitric acid solution)
Other means of identification	ICP-MS-QC2-1

Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses	Laboratory Chemical Reference Material

Details of the supplier of the safety data sheet

Registered company name	**Novachem Pty Ltd**
Address	25 Crissane Road, Heidelberg West Victoria 3081 Australia
Telephone	+61384151255
Fax	+61386250088
Website	www.novachem.com.au
Email	novachem@novachem.com.au

Emergency telephone number

Association / Organisation	**Victorian Poisons Information Centre**
Emergency telephone numbers	13 11 26
Other emergency telephone numbers	Not Available

SECTION 2 Hazards identification

Classification of the substance or mixture

HAZARDOUS CHEMICAL. DANGEROUS GOODS. According to the WHS Regulations and the ADG Code.

ChemWatch Hazard Ratings

	Min	Max
Flammability	0	
Toxicity	4	
Body Contact	4	
Reactivity	0	
Chronic	3	

0 = Minimum
1 = Low
2 = Moderate
3 = High
4 = Extreme

Poisons Schedule	Not Applicable
Classification [1]	Skin Corrosion/Irritation Category 1B, Specific target organ toxicity - single exposure Category 2, Corrosive to Metals Category 1, Serious Eye Damage/Eye Irritation Category 1, Acute Toxicity (Oral) Category 4, Acute Toxicity (Inhalation) Category 2
Legend:	*1. Classified by Chemwatch; 2. Classification drawn from HCIS; 3. Classification drawn from Regulation (EU) No 1272/2008 - Annex VI*

Label elements

Hazard pictogram(s)	
Signal word	**Danger**

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Hazard statement(s)

H314	Causes severe skin burns and eye damage.
H371	May cause damage to organs.
H290	May be corrosive to metals.
H302	Harmful if swallowed.
H330	Fatal if inhaled.

Precautionary statement(s) Prevention

P260	Do not breathe mist/vapours/spray.
P271	Use only outdoors or in a well-ventilated area.
P280	Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
P234	Keep only in original packaging.

Precautionary statement(s) Response

P301+P330+P331	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303+P361+P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
P304+P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Precautionary statement(s) Storage

P403+P233	Store in a well-ventilated place. Keep container tightly closed.
P405	Store locked up.

Precautionary statement(s) Disposal

P501	Dispose of contents/container to authorised hazardous or special waste collection point in accordance with any local regulation.

SECTION 3 Composition / information on ingredients

Substances

See section below for composition of Mixtures

Mixtures

CAS No	%[weight]	Name
7784-27-2	0.014	aluminium nitrate
7440-36-0	0.001	antimony
7440-38-2	0.001	arsenic
10022-31-8	0.002	barium nitrate
19049-40-2	0.011	beryllium acetate, basic
7440-43-9	0.001	cadmium
471-34-1	0.002	calcium carbonate
7789-02-8	0.008	chromic nitrate
7440-48-4	0.001	cobalt
7440-50-8	0.001	copper
7782-61-8	0.007	ferric nitrate
10099-74-8	0.002	lead nitrate
13446-18-9	0.01	magnesium nitrate
6156-78-1	0.004	manganese(II) acetate tetrahydrate
12054-85-2	0.002	ammonium molybdate
7440-02-0	0.001	nickel
7757-79-1	0.003	potassium nitrate
7446-08-4	0.001	selenium dioxide
7761-88-8	0.002	silver nitrate
7631-99-4	0.004	sodium nitrate
7440-28-0	0.001	thallium
13823-29-5	0.002	thorium nitrate
6159-44-0	0.002	uranyl acetate
1314-62-1	0.002	vanadium pentoxide
7440-66-6	0.001	zinc
7697-37-2	5	nitric acid
7732-18-5	94.914	water

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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 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

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	identity of the contaminant. ▸ Any personnel involved in rendering first aid must be monitored for radioactivity and thoroughly decontaminated if necessary.
Ingestion	If poisoning occurs, contact a doctor or Poisons Information Centre. ▸ 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.

Indication of any immediate medical attention and special treatment needed

Treat symptomatically.
Although gamma radiation is present in all uranium mines, levels rarely exceed the acceptable standard of 5 rads per year. Adverse effects of uranium mining result from the inhalation of radon daughters. (The decay of radium produces radon, which in turn forms short life radon daughters i.e. isotopes of lead bismuth and polonium.) These products attach to dust particles which are inhaled by workers.
Alpha radiation delivers 95% of the radiation dose to the tracheobronchial epithelium. Lung cancer mortality and chronic lung disease [in uranium miners] strongly depends on radon exposure, cigarette smoking, and height. Although squamous and oat cell tumour types display a dose response effect, there is some difference in the strength of the association.
[Ellenhorn & Barceloux]
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 Firefighting measures

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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.

Advice for firefighters

Fire Fighting	- Alert Fire Brigade and tell them location and nature of hazard. - Wear breathing apparatus plus protective gloves in the event of a fire. - Prevent, by any means available, spillage from entering drains or water courses. - Use fire fighting procedures suitable for surrounding area.
Fire/Explosion Hazard	Under certain conditions the material may become combustible because of the ease of ignition which occurs after the material reaches a high specific area ratio (thin sections, fine particles, or molten states). However, the same material in massive solid form is comparatively difficult to ignite. Nearly all metals will burn in air under certain conditions. Some are oxidised rapidly in the presence of air or moisture, generating sufficient heat to reach their ignition temperatures. - Non combustible. - Not considered to be a significant fire risk. - Acids may react with metals to produce hydrogen, a highly flammable and explosive gas. - Heating may cause expansion or decomposition leading to violent rupture of containers. Decomposition may produce toxic fumes of: metal oxides 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.
HAZCHEM	2X

SECTION 6 Accidental release measures

Personal precautions, protective equipment and emergency procedures

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. For spillages involving less than 20 times the "Annual Limit on Intake (ALI)" value for inhalation - Wear rubber or plastic gloves - Clean up liquid spillages with absorbent material - Monitor the affected area when no visible spill material remains, to check the progress of the decontamination, preferably less than one "Derived Working Limit (DWL)" - Treat all materials used in the decontamination process as radioactive waste - Monitor all persons involved in the spillage or decontamination operation - Remove contaminated clothing, place in plastic bags and seal
Major Spills	- **DO NOT** touch damaged containers or spilled materials. Damage to outer container may not affect primary inner container. - Isolate hazard area and deny entry. - Evacuate the area if there is a significant radiological hazard to persons - It may be necessary to dike far ahead of the spill area - Enter spill area only to save life; limit entry to shortest possible time.

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. Where widely different levels of activity and radiotoxicity are to be in use, separate rooms are preferred. - Eating, drinking, smoking and the application of cosmetics should not take place in a radioactive substances designated area. - Before work with unsealed radioactive substances proceeds, written procedures describing good working practices, should be available.
Other information	- Special security requirements apply in Federal/State regulation to the storage, packaging and handling of radioactive materials. - Regulation may include restriction on package size and quantities stored. - Store in an approved storage area and ensure that packages are appropriately labelled as required by relevant legislation. - Keep locked up at all times.

Conditions for safe storage, including any incompatibilities

Suitable container	- **DO NOT** use aluminium or galvanised containers For packaging of radioisotopes. Packaging should be designed and finished so that external surfaces are free of protruding features and can be easily decontaminated. The outer layer of packaging should be designed so as to prevent the collection and retention of water. Many international standards, relating to correct package type and design, are in force and should be observed when repacking the contents of the original containers.

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Storage incompatibility	Derivative of very electropositive metal. For aluminas (aluminium oxide): Incompatible with hot chlorinated rubber. In the presence of chlorine trifluoride may react violently and ignite. -May initiate explosive polymerisation of olefin oxides including ethylene oxide. -Produces exothermic reaction above 200°C with halocarbons and an exothermic reaction at ambient temperatures with halocarbons in the presence of other metals. The substance may be or contains a "metalloid" The following elements are considered to be metalloids; boron,silicon, germanium, arsenic, antimony, tellurium and (possibly) polonium The electronegativities and ionisation energies of the metalloids are between those of the metals and nonmetals, so the metalloids exhibit characteristics of both classes. The reactivity of the metalloids depends on the element with which they are reacting. For example, boron acts as a nonmetal when reacting with sodium yet as a metal when reacting with fluorine. Unlike most metals, most metalloids are amphoteric- that is they can act as both an acid and a base. Actinide (actinoid) Only thorium and uranium occur in usable quantities in nature. The other actinides are man-made elements. All actinides are radioactive. They share similar chemistry with the lanthanides (lanthanoids) The size of actinides decreases with increasing atomic number. ▸ WARNING: Avoid or control reaction with peroxides. All *transition metal* peroxides should be considered as potentially explosive. For example transition metal complexes of alkyl hydroperoxides may decompose explosively. ▸ The pi-complexes formed between chromium(0), vanadium(0) and other transition metals (haloarene-metal complexes) and mono-or poly-fluorobenzene show extreme sensitivity to heat and are explosive. ▸ 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
Australia Exposure Standards	aluminium nitrate	Aluminium, soluble salts (as Al)	2 mg/m3	Not Available	Not Available	Not Available
Australia Exposure Standards	antimony	Antimony & compounds (as Sb)	0.5 mg/m3	Not Available	Not Available	Not Available
Australia Exposure Standards	arsenic	Arsenic & soluble compounds (as As)	0.05 mg/m3	Not Available	Not Available	(g) Some compounds in these groups are classified as carcinogenic or as sensitisers. Check individual classification details on the safety data sheet for information on classification.
Australia Exposure Standards	barium nitrate	Barium, soluble compounds (as Ba)	0.5 mg/m3	Not Available	Not Available	Not Available
Australia Exposure Standards	beryllium acetate, basic	Beryllium & compounds	0.002 mg/m3	Not Available	Not Available	(g) Some compounds in these groups are classified as carcinogenic or as sensitisers. Check individual classification details on the safety data sheet for information on classification.
Australia Exposure Standards	cadmium	Cadmium and compounds (as Cd)	0.01 mg/m3	Not Available	Not Available	(g) Some compounds in these groups are classified as carcinogenic or as sensitisers. Check individual classification details on the safety data sheet for information on classification.
Australia Exposure Standards	calcium carbonate	Calcium carbonate	10 mg/m3	Not Available	Not Available	(a) This value is for inhalable dust containing no asbestos and < 1% crystalline silica.
Australia Exposure Standards	cobalt	Cobalt, metal dust & fume (as Co)	0.05 mg/m3	Not Available	Not Available	Not Available
Australia Exposure Standards	copper	Copper, dusts & mists (as Cu)	1 mg/m3	Not Available	Not Available	Not Available
Australia Exposure Standards	copper	Copper (fume)	0.2 mg/m3	Not Available	Not Available	Not Available
Australia Exposure Standards	ferric nitrate	Iron salts, soluble (as Fe)	1 mg/m3	Not Available	Not Available	Not Available
Australia Exposure Standards	lead nitrate	Lead, inorganic dusts & fumes (as Pb)	0.05 mg/m3	Not Available	Not Available	Not Available
Australia Exposure Standards	manganese(II) acetate tetrahydrate	Manganese, dust & compounds (as Mn)	1 mg/m3	Not Available	Not Available	Not Available
Australia Exposure Standards	ammonium molybdate	Molybdenum, soluble compounds (as Mo)	5 mg/m3	Not Available	Not Available	Not Available
Australia Exposure Standards	nickel	Nickel, powder	1 mg/m3	Not Available	Not Available	Not Available
Australia Exposure Standards	nickel	Nickel, metal	1 mg/m3	Not Available	Not Available	Not Available
Australia Exposure Standards	selenium dioxide	Selenium compounds (as Se) excluding hydrogen selenide	0.1 mg/m3	Not Available	Not Available	Not Available
Australia Exposure Standards	silver nitrate	Silver, soluble compounds (as Ag)	0.01 mg/m3	Not Available	Not Available	Not Available
Australia Exposure Standards	uranyl acetate	Uranium (natural), soluble & insoluble compounds (as H)	0.2 mg/m3	0.6 mg/m3	Not Available	Not Available

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Source	Ingredient	Material name	TWA	STEL	Peak	Notes
Australia Exposure Standards	vanadium pentoxide	Vanadium (as V2O5), (respirable dust & fume)	0.05 mg/m3	Not Available	Not Available	Not Available
Australia Exposure Standards	nitric acid	Nitric acid	2 ppm / 5.2 mg/m3	10 mg/m3 / 4 ppm	Not Available	Not Available

Emergency Limits

Ingredient	TEEL-1	TEEL-2	TEEL-3
aluminium nitrate	47 mg/m3	68 mg/m3	410 mg/m3
aluminium nitrate	83 mg/m3	920 mg/m3	5,500 mg/m3
antimony	1.5 mg/m3	13 mg/m3	80 mg/m3
arsenic	1.5 mg/m3	17 mg/m3	100 mg/m3
barium nitrate	2.9 mg/m3	350 mg/m3	2,100 mg/m3
cadmium	Not Available	Not Available	Not Available
calcium carbonate	45 mg/m3	210 mg/m3	1,300 mg/m3
chromic nitrate	6.9 mg/m3	110 mg/m3	640 mg/m3
cobalt	0.18 mg/m3	2 mg/m3	20 mg/m3
copper	3 mg/m3	33 mg/m3	200 mg/m3
ferric nitrate	13 mg/m3	140 mg/m3	850 mg/m3
ferric nitrate	22 mg/m3	110 mg/m3	640 mg/m3
lead nitrate	0.24 mg/m3	180 mg/m3	1,100 mg/m3
magnesium nitrate	30 mg/m3	330 mg/m3	2,000 mg/m3
magnesium nitrate	16 mg/m3	180 mg/m3	1,100 mg/m3
manganese(II) acetate tetrahydrate	13 mg/m3	22 mg/m3	740 mg/m3
manganese(II) acetate tetrahydrate	9.4 mg/m3	16 mg/m3	96 mg/m3
ammonium molybdate	2.6 mg/m3	230 mg/m3	1,400 mg/m3
ammonium molybdate	2.8 mg/m3	30 mg/m3	180 mg/m3
ammonium molybdate	3.1 mg/m3	22 mg/m3	130 mg/m3
nickel	4.5 mg/m3	50 mg/m3	99 mg/m3
potassium nitrate	9 mg/m3	100 mg/m3	600 mg/m3
selenium dioxide	0.84 mg/m3	1.6 mg/m3	9.5 mg/m3
silver nitrate	0.047 mg/m3	0.9 mg/m3	5.4 mg/m3
sodium nitrate	4.1 mg/m3	45 mg/m3	270 mg/m3
thallium	0.06 mg/m3	3.3 mg/m3	20 mg/m3
thorium nitrate	2.9 mg/m3	32 mg/m3	190 mg/m3
uranyl acetate	0.98 mg/m3	5.5 mg/m3	33 mg/m3
vanadium pentoxide	0.64 mg/m3	7 mg/m3	70 mg/m3
zinc	6 mg/m3	21 mg/m3	120 mg/m3
nitric acid	Not Available	Not Available	Not Available

Ingredient	Original IDLH	Revised IDLH
aluminium nitrate	Not Available	Not Available
antimony	Not Available	Not Available
arsenic	5 mg/m3	Not Available
barium nitrate	50 mg/m3	Not Available
beryllium acetate, basic	4 mg/m3	Not Available
cadmium	9 mg/m3	Not Available
calcium carbonate	Not Available	Not Available
chromic nitrate	Not Available	Not Available
cobalt	20 mg/m3	Not Available
copper	100 mg/m3	Not Available
ferric nitrate	Not Available	Not Available
lead nitrate	100 mg/m3	Not Available
magnesium nitrate	Not Available	Not Available
manganese(II) acetate tetrahydrate	500 mg/m3	Not Available
ammonium molybdate	1,000 mg/m3	Not Available
nickel	10 mg/m3	Not Available

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Ingredient	Original IDLH	Revised IDLH
potassium nitrate	Not Available	Not Available
selenium dioxide	1 mg/m3	Not Available
silver nitrate	10 mg/m3	Not Available
sodium nitrate	Not Available	Not Available
thallium	Not Available	Not Available
thorium nitrate	Not Available	Not Available
uranyl acetate	10 mg/m3	Not Available
vanadium pentoxide	35 mg/m3	Not Available
zinc	Not Available	Not Available
nitric acid	25 ppm	Not Available
water	Not Available	Not Available

Occupational Exposure Banding

Ingredient	Occupational Exposure Band Rating	Occupational Exposure Band Limit
chromic nitrate	E	≤ 0.01 mg/m³
magnesium nitrate	E	≤ 0.01 mg/m³
potassium nitrate	E	≤ 0.01 mg/m³
sodium nitrate	E	≤ 0.01 mg/m³
thallium	E	≤ 0.01 mg/m³
thorium nitrate	E	≤ 0.01 mg/m³
Notes:	*Occupational exposure banding is a process of assigning chemicals into specific categories or bands based on a chemical's potency and the adverse health outcomes associated with exposure. The output of this process is an occupational exposure band (OEB), which corresponds to a range of exposure concentrations that are expected to protect worker health.*	

Exposure controls

Appropriate engineering controls	For potential exposure to radioactive substances, local exhaust or process enclosure ventilation should be provided as a minimum. External radiation exposure may be controlled with adequate shielding. The absorbing material and its thickness will depend on the type of radiation, its energy, the flux and dimensions of the source. ▸ For **ALPHA PARTICLES** fraction of a millimetre of any ordinary material will generally be sufficient to attenuate the energy of the particle.
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	▸ Elbow length PVC gloves ▸ When handling corrosive liquids, wear trousers or overalls outside of boots, to avoid spills entering boots. Disposable gloves. Most gloves will provide protection against alpha particles, some protection against beta particles (depending on thickness) but will not shield gamma radiation. Used gloves may present a radiation hazard and should be disposed of as radioactive waste. Suitable gloves should be worn for all work with unsealed radioactive substances, and special care is to be exercised when putting on or removing gloves, to avoid contaminating the hands and the inside surfaces of the 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.* These garments are recommended even if the employee is working with a "glove-box" containment system. Protective clothing reserved specifically for radioactive work, shall be worn at all times *in a laboratory,* even for very low levels of specific activity. The following should be considered.

Recommended material(s)

GLOVE SELECTION INDEX

Glove selection is based on a modified presentation of the:
"Forsberg Clothing Performance Index".
The effect(s) of the following substance(s) is taken into account in the ***computer-generated*** selection:
ICP-MS Quality Control Sample 2

Material	CPI
BUTYL	A
NEOPRENE	A
HYPALON	C
NATURAL RUBBER	C
NATURAL+NEOPRENE	C
NEOPRENE/NATURAL	C
NITRILE+PVC	C

Respiratory protection

Particulate. (AS/NZS 1716 & 1715, EN 143:2000 & 149:001, ANSI Z88 or national equivalent)

Where the concentration of gas/particulates in the breathing zone, approaches or exceeds the "Exposure Standard" (or ES), respiratory protection is required. Degree of protection varies with both face-piece and Class of filter; the nature of protection varies with Type of filter.

Required Minimum Protection Factor	Half-Face Respirator	Full-Face Respirator	Powered Air Respirator
up to 10 x ES	-AUS P2	-	-PAPR-AUS / Class 1 P2
up to 50 x ES	-	-AUS / Class 1 P2	-
up to 100 x ES	-	-2 P2	-PAPR-2 P2 ^

^ - Full-face
A(All classes) = Organic vapours, B AUS or B1 = Acid gasses, B2 = Acid gas or

Continued...

PE/EVAL/PE	C
PVA	C
PVC	C
SARANEX-23	C
VITON	C

* CPI - Chemwatch Performance Index
A: Best Selection
B: Satisfactory; may degrade after 4 hours continuous immersion
C: Poor to Dangerous Choice for other than short term immersion
NOTE: As a series of factors will influence the actual performance of the glove, a final selection must be based on detailed observation. -
* Where the glove is to be used on a short term, casual or infrequent basis, factors such as "feel" or convenience (e.g. disposability), may dictate a choice of gloves which might otherwise be unsuitable following long-term or frequent use. A qualified practitioner should be consulted.

hydrogen cyanide(HCN), B3 = Acid gas or hydrogen cyanide(HCN), E = Sulfur dioxide(SO2), G = Agricultural chemicals, K = Ammonia(NH3), Hg = Mercury, NO = Oxides of nitrogen, MB = Methyl bromide, AX = Low boiling point organic compounds(below 65 degC)

SECTION 9 Physical and chemical properties

Information on basic physical and chemical properties

Appearance	Clear Liquid

Physical state	Liquid	**Relative density (Agua= 1)**	1.02
Odour	Not Available	**Partition coefficient n-octanol / water**	Not Available
Odour threshold	Not Available	**Auto-ignition temperature (°C)**	Not Available
pH (as supplied)	<2.0	**Decomposition temperature**	Not Available
Melting point / freezing point (°C)	Not Available	**Viscosity (cSt)**	Not Available
Initial boiling point and boiling range (°C)	83	**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)	2.4677974	**Gas group**	Not Available
Solubility in water	Miscible	**pH as a solution (1%)**	Not Available
Vapour density (Air = 1)	0.62	**VOC g/L**	Not Available

SECTION 10 Stability and reactivity

Reactivity	See section 7
Chemical stability	▸ Unstable in the presence of incompatible materials. ▸ Product is considered stable. ▸ Hazardous polymerisation will not occur.
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 can cause respiratory irritation in some persons. The body's response to such irritation can cause further lung damage. Corrosive acids can cause irritation of the respiratory tract, with coughing, choking and mucous membrane damage. There may be dizziness, headache, nausea and weakness. Inhalation of vapours or aerosols (mists, fumes), generated by the material during the course of normal handling, may produce severe damage to the health of the individual. Relatively small amounts absorbed through the lungs may prove fatal. Dusts and mists containing uranium compounds are **highly toxic** and more so if inhaled rather than ingested. A single large dose can produce radiation sickness. alpha-Radiation kills cells immediately adjacent to the source of contact. Damage may be irreversible. A whole body dose of 2-10 Gray may cause loss of appetite, tiredness, nausea and vomiting, most severe after 6-12 hours. After this subsides a gross disturbance in blood cell distribution occurs with loss of white blood cells and platelets over weeks.

Continued...

Ingestion	Accidental ingestion of the material may be harmful; animal experiments indicate that ingestion of less than 150 gram may be fatal or may produce serious damage to the health of the individual. Ingestion of acidic corrosives may produce burns around and in the mouth, the throat and oesophagus. Immediate pain and difficulties in swallowing and speaking may also be evident. The kidney and liver can be damaged by uranium, causing excessive acid and urea in the blood and generalised ill health. Uranium compounds are not highly poisonous in low concentrations but may be lethal in high concentrations.
Skin Contact	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. Skin contact is not thought to produce harmful health effects (as classified under EC Directives using animal models). Systemic harm, however, has been identified following exposure of animals by at least one other route and 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. Thus it may cause itching and skin reaction and inflammation. All soluble uranium compounds are lethal when applied at sufficiently high concentrations in a single dose to the skin of rabbits; insoluble salts do not cause death and cause no signs of poisoning. 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. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected. A whole body dose of 2-10 Gray may cause loss of appetite, tiredness, nausea and vomiting, most severe after 6-12 hours. After this subsides a gross disturbance in blood cell distribution occurs with loss of white blood cells and platelets over weeks.
Eye	Direct eye contact with acid corrosives may produce pain, tears, sensitivity to light and burns. Mild burns of the epithelia generally recover rapidly and completely. If applied to the eyes, this material causes severe eye damage. Soluble uranium compounds are very dangerous. A single dose of 1 Gray may cause inflammation of the conjunctiva and cornea. alpha-Radiation produces severe inflammation of eyelid tissue and eye surface. There may be a delay of years before symptoms develop. Irritation of the eyes may produce a heavy secretion of tears (lachrymation). The eye is particularly sensitive to radioactivity. A single dose of 1 Gy can cause inflammation of the conjunctiva and cornea.
Chronic	Repeated or prolonged exposure to acids may result in the erosion of teeth, swelling and/or ulceration of mouth lining. Irritation of airways to lung, with cough, and inflammation of lung tissue often occurs. Repeated or long-term occupational exposure is likely to produce cumulative health effects involving organs or biochemical systems. Long-term exposure to respiratory irritants may result in airways disease, involving difficulty breathing and related whole-body problems. Animal testing shows long term exposure to aluminium oxides may cause lung disease and cancer, depending on the size of the particle. The smaller the size, the greater the tendencies of causing harm. Chromium (III) is an essential trace mineral. Chronic exposure to chromium (III) irritates the airways, malnourishes the liver and kidneys, causes fluid in the lungs, and adverse effects on white blood cells, and also increases the risk of developing lung cancer. Actinides accumulate in the bone and may produce bone cancers. If absorbed in the body, uranium can be a hazard due to its radioactivity (alpha and gamma radiation). Uranium accumulates in the bones and can cause cancers there. A single large or prolonged low exposure to radiation can cause delayed effects, including blood cancers, genetic disorders, shortened lifespan and cataracts. Leukaemia is the most common cancer caused; cancers of the thyroid, bone, lung (due to radioactive particle deposits) and skin are also seen.

ICP-MS Quality Control Sample 2	**TOXICITY**	**IRRITATION**
	Not Available	Not Available
aluminium nitrate	**TOXICITY**	**IRRITATION**
	Dermal (rabbit) LD50: >5000 mg/kg[1]	Eye (rabbit): 100mg - SEVERE
	Oral(Rat) LD50; 204 mg/kg[2]	Skin (rabbit): 500mg - mild
antimony	**TOXICITY**	**IRRITATION**
	Dermal (rabbit) LD50: >8000 mg/kg[1]	Eye: no adverse effect observed (not irritating)[1]
	Inhalation(Rat) LC50; >5.2 mg/l4[1]	Skin: no adverse effect observed (not irritating)[1]
	Oral(Rat) LD50; 100 mg/kg[2]	
arsenic	**TOXICITY**	**IRRITATION**
	Oral(Mouse) LD50; 144 mg/kg[2]	Eye: adverse effect observed (irreversible damage)[1]
		Skin: adverse effect observed (irritating)[1]
barium nitrate	**TOXICITY**	**IRRITATION**
	dermal (rat) LD50: >2000 mg/kg[1]	Eye (rabbit):100 mg/24h - moderate
	Oral(Rat) LD50; >50<300 mg/kg[1]	Skin (rabbit): 500 mg/24h - mild
beryllium acetate, basic	**TOXICITY**	**IRRITATION**
	Not Available	Not Available
cadmium	**TOXICITY**	**IRRITATION**
	Inhalation(Rabbit) LC50; 0.028 mg/L4[1]	Not Available
	Oral(Rat) LD50; >63<259 mg/kg[1]	
calcium carbonate	**TOXICITY**	**IRRITATION**

Continued...

	dermal (rat) LD50: >2000 mg/kg[1]	Eye (rabbit): 0.75 mg/24h - SEVERE
	Inhalation(Rat) LC50; >3 mg/l4[1]	Eye: no adverse effect observed (not irritating)[1]
	Oral(Rat) LD50; >2000 mg/kg[1]	Skin (rabbit): 500 mg/24h-moderate
		Skin: no adverse effect observed (not irritating)[1]
chromic nitrate	**TOXICITY**	**IRRITATION**
	Inhalation(Rat) LC50; <4.58 mg/l4[1]	Not Available
	Oral(Rat) LD50; 819.444 mg/kg[1]	
cobalt	**TOXICITY**	**IRRITATION**
	dermal (rat) LD50: >2000 mg/kg[1]	Eye: adverse effect observed (irritating)[1]
	Inhalation(Rat) LC50; <=0.05 mg/l4[1]	Skin: no adverse effect observed (not irritating)[1]
	Oral(Rat) LD50; ~550 mg/kg[1]	
copper	**TOXICITY**	**IRRITATION**
	dermal (rat) LD50: >2000 mg/kg[1]	Eye: no adverse effect observed (not irritating)[1]
	Inhalation(Rat) LC50; 0.733 mg/l4[1]	Skin: no adverse effect observed (not irritating)[1]
	Oral(Mouse) LD50; 0.7 mg/kg[2]	
ferric nitrate	**TOXICITY**	**IRRITATION**
	dermal (rat) LD50: >2000 mg/kg[1]	Not Available
	Oral(Rat) LD50; >2000 mg/kg[1]	
lead nitrate	**TOXICITY**	**IRRITATION**
	dermal (rat) LD50: >2000 mg/kg[1]	Not Available
	Inhalation(Rat) LC50; >5.05 mg/l4[1]	
	Oral(Rat) LD50; >2000 mg/kg[1]	
magnesium nitrate	**TOXICITY**	**IRRITATION**
	Oral(Rat) LD50; 5440 mg/kg[2]	Eye (rabbit): 500 mg/24h - mild
		Skin (rabbit): 500 mg/24h - mild
manganese(II) acetate tetrahydrate	**TOXICITY**	**IRRITATION**
	Oral(Rat) LD50; 3730 mg/kg[2]	Not Available
ammonium molybdate	**TOXICITY**	**IRRITATION**
	Oral(Rat) LD50; 333 mg/kg[2]	Eye: no adverse effect observed (not irritating)[1]
		Skin: no adverse effect observed (not irritating)[1]
nickel	**TOXICITY**	**IRRITATION**
	Oral(Rat) LD50; >9000 mg/kg[1]	Eye: no adverse effect observed (not irritating)[1]
		Skin: no adverse effect observed (not irritating)[1]
potassium nitrate	**TOXICITY**	**IRRITATION**
	dermal (rat) LD50: >5000 mg/kg[1]	Not Available
	Inhalation(Rat) LC50; >0.527 mg/l4[1]	
	Oral(Rat) LD50; >2000 mg/kg[1]	
selenium dioxide	**TOXICITY**	**IRRITATION**
	Inhalation(Rat) LC50; >0.052<=0.51 mg/l4[1]	Not Available
	Oral(Rat) LD50; >=50<=500 mg/kg[1]	
silver nitrate	**TOXICITY**	**IRRITATION**
	dermal (rat) LD50: >2000 mg/kg[1]	Eye (rabbit): 1 mg - SEVERE
	Oral(Rat) LD50; >2000 mg/kg[1]	Eye (rabbit): 10 mg - moderate
sodium nitrate	**TOXICITY**	**IRRITATION**
	dermal (rat) LD50: >5000 mg/kg[1]	Not Available
	Oral(Rat) LD50; >884.956 mg/kg[1]	

Continued...

thallium	**TOXICITY**	**IRRITATION**
	Not Available	Not Available
thorium nitrate	**TOXICITY**	**IRRITATION**
	Oral(Mouse) LD50; 1760 mg/kg[2]	Not Available
uranyl acetate	**TOXICITY**	**IRRITATION**
	Oral(Rat) LD50; 204 mg/kg[2]	Not Available
vanadium pentoxide	**TOXICITY**	**IRRITATION**
	dermal (rat) LD50: >2500 mg/kg[1]	Not Available
	Inhalation(Rat) LC50; 2.2116.19 mg/l4[2]	
	Oral(Rat) LD50; ~221.1715.7 mg/kg[2]	
zinc	**TOXICITY**	**IRRITATION**
	Dermal (rabbit) LD50: 1130 mg/kg[2]	Eye: no adverse effect observed (not irritating)[1]
	Oral(Rat) LD50; >2000 mg/kg[1]	Skin: no adverse effect observed (not irritating)[1]
nitric acid	**TOXICITY**	**IRRITATION**
	Inhalation(Rat) LC50; 0.13 mg/L4[2]	Eye: adverse effect observed (irritating)[1]
		Skin: adverse effect observed (corrosive)[1]
water	**TOXICITY**	**IRRITATION**
	Oral(Rat) LD50; >90 mg/kg[2]	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*	

ARSENIC	Arsenic compounds are classified by the European Union as toxic by inhalation and ingestion and toxic to aquatic life and long lasting in the environment. IARC classify arsenic in drinking water as a confirmed human carcinogen (IARC 1). The main inorganic forms of arsenic relevant for human exposures are pentavalent arsenic (also called arsenate, As(V), or As+5) and trivalent arsenic (also called arsenite, As(III), or As+3). These inorganic species undergoes a series of reduction and oxidative/methylation steps in human liver and other tissues to form tri- and pentavalent methylated metabolites of methylarsonite [MA(III)], methylarsonate [MA(V)], dimethylarsinite [DMA(III)], and dimethylarsinate [DMA(V)]. Some mammalian species also produce trimethylated metabolites, trimethylarsine oxide The distinction between inorganic and organic forms is important because it is generally accepted that the organic species are excreted more quickly from the body and generally considered less toxic, with a relative rank order of As(III) > As(V) >> MA(V), DMA(V) >> arsenobetaine. Tumorigenic - Carcinogenic by RTECS criteria.
BARIUM NITRATE	The material may produce moderate eye irritation leading to inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.
CALCIUM CARBONATE	No evidence of carcinogenic properties. No evidence of mutagenic or teratogenic effects.
CHROMIC NITRATE	for nonahydrate: Bacterial mutagen
COBALT	Allergic reactions involving the respiratory tract are usually due to interactions between IgE antibodies and allergens and occur rapidly. Allergic potential of the allergen and period of exposure often determine the severity of symptoms. Some people may be genetically more prone than others, and exposure to other irritants may aggravate symptoms. Allergy causing activity is due to interactions with proteins. 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. Such allergy is of the delayed type with onset up to four hours following exposure.
COPPER	WARNING: Inhalation of high concentrations of copper fume may cause "metal fume fever", an acute industrial disease of short duration. Symptoms are tiredness, influenza like respiratory tract irritation with fever. for copper and its compounds (typically copper chloride): **Acute toxicity:** There are no reliable acute oral toxicity results available. In an acute dermal toxicity study (OECD TG 402), one group of 5 male rats and 5 groups of 5 female rats received doses of 1000, 1500 and 2000 mg/kg bw via dermal application for 24 hours. The LD50 values of copper monochloride were 2,000 mg/kg bw or greater for male (no deaths observed) and 1,224 mg/kg bw for female. Four females died at both 1500 and 2000 mg/kg bw, and one at 1,000 mg/kg bw.
MAGNESIUM NITRATE	The material may be irritating to the eye, with prolonged contact causing inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis. Magnesium nitrate heaxahydrate is a methaemoglobin-forming agent which if inhaled or ingested in high enough concentrations may cause fatigue, headache, dizziness. (Source: I.L.O. Encyclopaedia)
AMMONIUM MOLYBDATE	For ammonium dimolybdate: (CAS 27546-07-2) Positive reaction in 20% of experimental animals (OECD 406; GPMT according to Magnusoon-Kligman
NICKEL	Oral (rat) TDLo: 500 mg/kg/5D-I Inhalation (rat) TCLo: 0.1 mg/m3/24H/17W-C Tenth Annual Report on Carcinogens: Substance anticipated to be Carcinogen [*National Toxicology Program: U.S. Dep. of Health & Human Services 2002*]
SELENIUM DIOXIDE	IARC Group 3 [MDL OHS] Bacterial cell mutagen Reproductive effector in rats.
SILVER NITRATE	Reproductive effector in rats Human lymphocyte mutagen Equivocal tumorigen by RTECS criteria
SODIUM NITRATE	Laboratory (in vitro) and animal studies show, exposure to the material may result in a possible risk of irreversible effects, with the possibility of producing mutation.
THALLIUM	Structural changes in nerves and sheath, changes in extraocular muscles, hair loss recorded

Continued...

THORIUM NITRATE	Thorium and its compounds are mainly alpha particle emitters although beta and gamma radiation is also encountered The radiological danger is considerably more serious than the chemical danger in view of the long time that all thorium compounds remain in the organs where they are deposited (mainly in bones, lungs, lymphatic glands etc.) leading to long-term alpha-irradiation of the tissues.
URANYL ACETATE	exposure (to) natural: uranium NAT-U 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.
VANADIUM PENTOXIDE	Exposure to the material for prolonged periods may cause physical defects in the developing embryo (teratogenesis). Coma, post-implantation mortality, foetolethality, specific developmental abnormalities and effects on the embryo reported.
NITRIC ACID	Oral (?) LD50: 50-500 mg/kg * [Various Manufacturers] 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. Repeated exposures may produce severe ulceration.
ICP-MS Quality Control Sample 2 & BERYLLIUM ACETATE, BASIC & CALCIUM CARBONATE & CHROMIC NITRATE & FERRIC NITRATE & LEAD NITRATE & MANGANESE(II) ACETATE TETRAHYDRATE & AMMONIUM MOLYBDATE & SILVER NITRATE & SODIUM NITRATE & VANADIUM PENTOXIDE & NITRIC ACID	Asthma-like symptoms may continue for months or even years after exposure to the material ends. This may be due to a non-allergic condition known as reactive airways dysfunction syndrome (RADS) which can occur after exposure to high levels of highly irritating compound. Main criteria for diagnosing RADS include the absence of previous airways disease in a non-atopic individual, with sudden onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant. Other criteria for diagnosis of RADS include a reversible airflow pattern on lung function tests, moderate to severe bronchial hyperreactivity on methacholine challenge testing, and the lack of minimal lymphocytic inflammation, without eosinophilia.
ICP-MS Quality Control Sample 2 & CHROMIC NITRATE	On skin and inhalation exposure, chromium and its compounds (except hexavalent) can be a potent sensitiser, as particulates. Studies show that they have a complex toxicity mechanism with hexavalent chromium associated with an increased risk of lung damage and respiratory cancers (primarily bronchogenic and nose cancers). However, there is no evidence that elemental, divalent, or trivalent chromium compounds causes cancer or genetic toxicity.
ICP-MS Quality Control Sample 2 & 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. Cells from the respiratory tract have not been examined in this respect. Mucous secretion may protect the cells of the airway from direct exposure to inhaled acidic mists (which also protects the stomach lining from the hydrochloric acid secreted there).
ALUMINIUM NITRATE & CALCIUM CARBONATE & SILVER NITRATE & NITRIC ACID	The material may produce severe irritation to the eye causing pronounced inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.
ALUMINIUM NITRATE & BARIUM NITRATE & CALCIUM CARBONATE & MAGNESIUM 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.
ARSENIC & BERYLLIUM ACETATE, BASIC	**WARNING:** This substance has been classified by the IARC as Group 1: **CARCINOGENIC TO HUMANS**.
BERYLLIUM ACETATE, BASIC & COBALT & AMMONIUM MOLYBDATE & NICKEL	The following information refers to contact allergens as a group and may not be specific to this product. Contact allergies quickly manifest themselves as contact eczema, more rarely as urticaria or Quincke's oedema. The pathogenesis of contact eczema involves a cell-mediated (T lymphocytes) immune reaction of the delayed type. Other allergic skin reactions, e.g. contact urticaria, involve antibody-mediated immune reactions. The significance of the contact allergen is not simply determined by its sensitisation potential: the distribution of the substance and the opportunities for contact with it are equally important.
BERYLLIUM ACETATE, BASIC & THORIUM NITRATE & ZINC & WATER	No significant acute toxicological data identified in literature search.
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 either not available or does not fill the criteria for classification*
✔ *– Data available to make classification*

SECTION 12 Ecological information

Toxicity

ICP-MS Quality Control Sample 2

Endpoint	Test Duration (hr)	Species	Value	Source
Not Available	Not Available	Not Available	Not Available	Not Available

aluminium nitrate

Endpoint	Test Duration (hr)	Species	Value	Source
EC50	48	Crustacea	0.33mg/l	2
LC50	96	Fish	>0.105mg/l	2

Continued...

	EC50	72	Algae or other aquatic plants	0.075mg/l	2
	EC10(ECx)	72	Algae or other aquatic plants	0.015mg/l	2
	EC50	96	Algae or other aquatic plants	4.5mg/l	2

antimony

Endpoint	Test Duration (hr)	Species	Value	Source
NOEC(ECx)	96	Fish	0.031mg/L	4
LC50	96	Fish	>0.031<0.041mg/L	4
EC50	48	Crustacea	423.45mg/l	2
EC50	72	Algae or other aquatic plants	>2.4mg/l	2
EC50	96	Algae or other aquatic plants	0.61mg/l	2

arsenic

Endpoint	Test Duration (hr)	Species	Value	Source
EC10(ECx)	48	Crustacea	0.006mg/l	2
LC50	96	Fish	3.38mg/l	2
EC50	48	Crustacea	0.85mg/l	2

barium nitrate

Endpoint	Test Duration (hr)	Species	Value	Source
EC50	48	Crustacea	>=16<=18mg/l	2
LC50	96	Fish	>3.5mg/l	2
NOEC(ECx)	1728	Algae or other aquatic plants	>=1.15mg/l	2
EC50	72	Algae or other aquatic plants	>1.15mg/l	2

beryllium acetate, basic

Endpoint	Test Duration (hr)	Species	Value	Source
Not Available	Not Available	Not Available	Not Available	Not Available

cadmium

Endpoint	Test Duration (hr)	Species	Value	Source
NOEC(ECx)	24	Fish	<0.001mg/L	4
LC50	96	Fish	0.001mg/L	4
EC50	48	Crustacea	0.54-0.62mg/l	4
EC50	72	Algae or other aquatic plants	>6mg/l	4
EC50	96	Algae or other aquatic plants	0.049-0.162mg/l	4

calcium carbonate

Endpoint	Test Duration (hr)	Species	Value	Source
NOEC(ECx)	6	Fish	4-320mg/l	4
LC50	96	Fish	>229.245mg/L	4
EC50	72	Algae or other aquatic plants	>14mg/l	2

chromic nitrate

Endpoint	Test Duration (hr)	Species	Value	Source
LC50	96	Fish	20.1mg/l	2
EC50(ECx)	96	Algae or other aquatic plants	0.094-0.114mg/l	4
EC50	96	Algae or other aquatic plants	0.094-0.114mg/l	4

cobalt

Endpoint	Test Duration (hr)	Species	Value	Source
NOEC(ECx)	72	Algae or other aquatic plants	0.01-0.015mg/l	1
LC50	96	Fish	1.512mg/l	2
EC50	48	Crustacea	5.89mg/l	2
EC50	96	Algae or other aquatic plants	23.8mg/l	2

copper

Endpoint	Test Duration (hr)	Species	Value	Source
NOEC(ECx)	9	Crustacea	<0.001mg/L	4
LC50	96	Fish	<0.001mg/L	4
EC50	48	Crustacea	<0.001mg/L	4
EC50	72	Algae or other aquatic plants	<0.001mg/L	4
EC50	96	Algae or other aquatic plants	<0.001mg/L	4

ferric nitrate

Endpoint	Test Duration (hr)	Species	Value	Source
LC50	96	Fish	1010mg/l	2
NOEC(ECx)	3504	Fish	1.6mg/l	2
EC50	72	Algae or other aquatic plants	18mg/l	2

Continued...

lead nitrate

Endpoint	Test Duration (hr)	Species	Value	Source
EC50	48	Crustacea	0.37mg/L	5
LC50	96	Fish	0.004mg/L	4
BCF	888	Fish	72-250	7
NOEC(ECx)	96	Fish	<0.001mg/L	4
EC50	72	Algae or other aquatic plants	0.681-0.999mg/l	4
EC50	96	Algae or other aquatic plants	1.755mg/L	4

magnesium nitrate

Endpoint	Test Duration (hr)	Species	Value	Source
EC50(ECx)	24	Crustacea	6075mg/L	5

manganese(II) acetate tetrahydrate

Endpoint	Test Duration (hr)	Species	Value	Source
EC10(ECx)	240	Algae or other aquatic plants	~5.1mg/l	2
LC50	96	Fish	2850mg/l	2
EC50	48	Crustacea	65mg/l	2
EC50	96	Algae or other aquatic plants	31mg/l	2

ammonium molybdate

Endpoint	Test Duration (hr)	Species	Value	Source
LC50	96	Fish	550mg/l	2
NOEC(ECx)	72	Algae or other aquatic plants	25mg/l	2

nickel

Endpoint	Test Duration (hr)	Species	Value	Source
EC50(ECx)	72	Algae or other aquatic plants	0.18mg/l	1
LC50	96	Fish	0.003mg/L	4
EC50	48	Crustacea	>100mg/l	1
EC50	72	Algae or other aquatic plants	0.18mg/l	1
EC50	96	Algae or other aquatic plants	0.005mg/L	4

potassium nitrate

Endpoint	Test Duration (hr)	Species	Value	Source
EC50(ECx)	96	Crustacea	39mg/l	2
LC50	96	Fish	0.67mg/L	4
EC50	48	Crustacea	490mg/l	2

selenium dioxide

Endpoint	Test Duration (hr)	Species	Value	Source
NOEC(ECx)	672	Fish	0.003mg/L	4
LC50	96	Fish	0.018-0.024mg/L	4

silver nitrate

Endpoint	Test Duration (hr)	Species	Value	Source
NOEC(ECx)	12960	Fish	<0.001mg/l	1
BCF	792	Fish	<54-310	7
LC50	96	Fish	<0.001mg/L	4
EC50	48	Crustacea	<0.001mg/L	4
EC50	72	Algae or other aquatic plants	0.153mg/L	4
EC50	96	Algae or other aquatic plants	<0.001mg/L	4

sodium nitrate

Endpoint	Test Duration (hr)	Species	Value	Source
NOEC(ECx)	2880	Fish	1.6mg/l	4
LC50	96	Fish	14.431-16.214mg/L	4
EC50	48	Crustacea	3581mg/l	2

thallium

Endpoint	Test Duration (hr)	Species	Value	Source
NOEC(ECx)	720	Fish	0.04mg/L	5
LC50	96	Fish	0.142-0.226mg/L	4

thorium nitrate

Endpoint	Test Duration (hr)	Species	Value	Source
Not Available	Not Available	Not Available	Not Available	Not Available

uranyl acetate

Endpoint	Test Duration (hr)	Species	Value	Source
NOEC(ECx)	504	Algae or other aquatic plants	4.978mg/l	4
LC50	96	Fish	2.1-4mg/l	4
EC50	48	Crustacea	7.52-13.8mg/l	4

Continued...

vanadium pentoxide	**Endpoint**	**Test Duration (hr)**	**Species**	**Value**	**Source**
	EC50	48	Crustacea	1.4mg/l	2
	BCF	672	Fish	3.4-14	7
	LC50	96	Fish	0.029-0.078mg/L	4
	EC50	72	Algae or other aquatic plants	1.08mg/l	2
	EC10(ECx)	504	Crustacea	0.05mg/l	2
zinc	**Endpoint**	**Test Duration (hr)**	**Species**	**Value**	**Source**
	NOEC(ECx)	336	Fish	<0.001mg/L	4
	LC50	96	Fish	0.001mg/L	4
	EC50	48	Crustacea	1.4mg/l	2
	EC50	72	Algae or other aquatic plants	0.005mg/l	4
	EC50	96	Algae or other aquatic plants	0.027mg/L	4
nitric acid	**Endpoint**	**Test Duration (hr)**	**Species**	**Value**	**Source**
	NOEC(ECx)	16	Crustacea	0.276mg/L	4
	LC50	96	Fish	0.186mg/L	4
	EC50	48	Crustacea	490mg/l	2
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*				

Although the components of an ecosystem can be divided into several major compartments, they function as a unit by means of connections or interchanges between them. Initial uranium deposition in a compartment, as well as exchanges between compartments (mobility), are dependent upon numerous factors such as chemical and physical form of the uranium, environmental media, organic material present, oxidation-reduction potential, nature of sorbing materials, and size and composition of sorbing particles. Environmental concerns related to uranium generally arise following deliberate release (in munitions) and notably address concerns related to ionising radiation. Less well recognised is exposure to depleted forms of uranium resulting from radioactive decay.

Ecotoxicity:

The tolerance of water organisms towards pH margin and variation is diverse. Recommended pH values for test species listed in OECD guidelines are between 6.0 and almost 9.
Acute testing with fish showed 96h-LC50 at about pH 3.5
For Metal:
Atmospheric Fate - Metal-containing inorganic substances generally have negligible vapour pressure and are not expected to partition to air.
Environmental Fate: Environmental processes, such as oxidation, the presence of acids or bases and microbiological processes, may transform insoluble metals to more soluble ionic forms. Environmental processes may enhance bioavailability and may also be important in changing solubilities.
Aquatic/Terrestrial Fate: When released to dry soil, most metals will exhibit limited mobility and remain in the upper layer; some will leach locally into ground water and/ or surface water ecosystems when soaked by rain or melt ice. A metal ion is considered infinitely persistent because it cannot degrade further.
Speciation of arsenic is an important consideration in the fate, movement, and action of this substance. Chemical and biochemical transformations of arsenic include oxidation, reduction and methylation which affects its volatilisation, adsorption, dissolution and biological disposition. The transport of arsenic in the environment is largely controlled by absorption/desorption processes in soils and sediments. Sediment movement is responsible for transport of arsenic soil residues to their ultimate sinks in deep ocean sediments.
For Chromium: Chromium is poorly absorbed by cells found in microorganisms, plants and animals. Hexavalent chromate anions are readily transported into cells and toxicity is closely linked to the higher oxidation state.
Ecotoxicity - Toxicity in Aquatic Organisms: Chromium is harmful to aquatic organisms in very low concentrations. Organisms consumed by fish species are very sensitive to low levels of chromium.
For chromium:
Aquatic Fate - Most chromium released into water will be deposited in the sediment. A small percentage of chromium can be found in soluble and insoluble forms with soluble chromium making up a very small percentage of the total chromium. Most of the soluble chromium is present as chromium (VI) and soluble chromium (III) complexes. In the aquatic phase, chromium (III) occurs mostly as suspended solids adsorbed onto clayish materials, organics, or iron oxide present in water.
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. From natural sources, vanadium is probably in the form of less soluble trivalent mineral particles.
Atmospheric Fate: Vanadium generally enters the atmosphere as an aerosol. Natural and man-made sources of vanadium tend to release large particles that are more likely to settle near the source.
DO NOT discharge into sewer or waterways.

Persistence and degradability

Ingredient	Persistence: Water/Soil	Persistence: Air
aluminium nitrate	LOW	LOW
potassium nitrate	LOW	LOW
selenium dioxide	HIGH	HIGH
silver nitrate	LOW	LOW
sodium nitrate	LOW	LOW
water	LOW	LOW

Bioaccumulative potential

Ingredient	Bioaccumulation
aluminium nitrate	LOW (LogKOW = 0.209)
lead nitrate	LOW (BCF = 250)
ammonium molybdate	LOW (BCF = 5.7)

Continued...

Ingredient	Bioaccumulation
potassium nitrate	LOW (LogKOW = 0.209)
selenium dioxide	LOW (LogKOW = -0.771)
silver nitrate	MEDIUM (BCF = 600)
sodium nitrate	LOW (LogKOW = 0.209)
vanadium pentoxide	LOW (BCF = 14)
water	LOW (LogKOW = -1.38)

Mobility in soil

Ingredient	Mobility
aluminium nitrate	LOW (KOC = 14.3)
potassium nitrate	LOW (KOC = 14.3)
selenium dioxide	LOW (KOC = 23.74)
silver nitrate	LOW (KOC = 14.3)
sodium nitrate	LOW (KOC = 14.3)
water	LOW (KOC = 14.3)

SECTION 13 Disposal considerations

Waste treatment methods

Product / Packaging disposal	▸ Containers may still present a chemical hazard/ danger when empty. ▸ Return to supplier for reuse/ recycling if possible. Otherwise: ▸ If container can not be cleaned sufficiently well to ensure that residuals do not remain or if the container cannot be used to store the same product, then puncture containers, to prevent re-use, and bury at an authorised landfill. ▸ Where possible retain label warnings and SDS and observe all notices pertaining to the product. ▸ WARNING Radioactive materials must not be disposed of as Industrial Waste or domestic garbage. Consult supplier/ appropriate Radiation Control Authority for disposal procedures

SECTION 14 Transport information

Labels Required

	
Marine Pollutant	NO
HAZCHEM	2X

Land transport (ADG)

UN number	3264
UN proper shipping name	CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (Nitric acid solution)
Transport hazard class(es)	Class: 8 Subrisk: Not Applicable
Packing group	III
Environmental hazard	Not Applicable
Special precautions for user	Special provisions: 223 274 Limited quantity: 5 L

Air transport (ICAO-IATA / DGR)

UN number	3264
UN proper shipping name	Corrosive liquid, acidic, inorganic, n.o.s. * (Nitric acid solution)
Transport hazard class(es)	ICAO/IATA Class: 8 ICAO / IATA Subrisk: Not Applicable ERG Code: 8L
Packing group	III
Environmental hazard	Not Applicable
Special precautions for user	Special provisions: A3 A803 Cargo Only Packing Instructions: 856

Continued...

Cargo Only Maximum Qty / Pack	60 L
Passenger and Cargo Packing Instructions	852
Passenger and Cargo Maximum Qty / Pack	5 L
Passenger and Cargo Limited Quantity Packing Instructions	Y841
Passenger and Cargo Limited Maximum Qty / Pack	1 L

Sea transport (IMDG-Code / GGVSee)

UN number	3264
UN proper shipping name	CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (Nitric acid solution)
Transport hazard class(es)	IMDG Class: 8 IMDG Subrisk: Not Applicable
Packing group	III
Environmental hazard	Not Applicable
Special precautions for user	EMS Number: F-A , S-B Special provisions: 223 274 Limited Quantities: 5 L

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

Product name	Pollution Category	Ship Type
Nitric acid (less than 70%)	Y	2

Transport in bulk in accordance with MARPOL Annex V and the IMSBC Code

Product name	Group
aluminium nitrate	Not Available
antimony	Not Available
arsenic	Not Available
barium nitrate	Not Available
beryllium acetate, basic	Not Available
cadmium	Not Available
calcium carbonate	Not Available
chromic nitrate	Not Available
cobalt	Not Available
copper	Not Available
ferric nitrate	Not Available
lead nitrate	Not Available
magnesium nitrate	Not Available
manganese(II) acetate tetrahydrate	Not Available
ammonium molybdate	Not Available
nickel	Not Available
potassium nitrate	Not Available
selenium dioxide	Not Available
silver nitrate	Not Available
sodium nitrate	Not Available
thallium	Not Available
thorium nitrate	Not Available
uranyl acetate	Not Available
vanadium pentoxide	Not Available
zinc	Not Available
nitric acid	Not Available
water	Not Available

Transport in bulk in accordance with the ICG Code

Product name	Ship Type
aluminium nitrate	Not Available
antimony	Not Available
arsenic	Not Available
barium nitrate	Not Available

Continued...

Product name	Ship Type
beryllium acetate, basic	Not Available
cadmium	Not Available
calcium carbonate	Not Available
chromic nitrate	Not Available
cobalt	Not Available
copper	Not Available
ferric nitrate	Not Available
lead nitrate	Not Available
magnesium nitrate	Not Available
manganese(II) acetate tetrahydrate	Not Available
ammonium molybdate	Not Available
nickel	Not Available
potassium nitrate	Not Available
selenium dioxide	Not Available
silver nitrate	Not Available
sodium nitrate	Not Available
thallium	Not Available
thorium nitrate	Not Available
uranyl acetate	Not Available
vanadium pentoxide	Not Available
zinc	Not Available
nitric acid	Not Available
water	Not Available

SECTION 15 Regulatory information

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

aluminium nitrate is found on the following regulatory lists

Australian Inventory of Industrial Chemicals (AIIC)
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Group 2A: Probably carcinogenic to humans

antimony is found on the following regulatory lists

Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 4
Australian Inventory of Industrial Chemicals (AIIC)
Chemical Footprint Project - Chemicals of High Concern List

arsenic is found on the following regulatory lists

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 4
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 6
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 7
Australian Inventory of Industrial Chemicals (AIIC)
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Group 1: Carcinogenic to humans

barium nitrate is found on the following regulatory lists

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 6
Australian Inventory of Industrial Chemicals (AIIC)
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Group 2A: Probably carcinogenic to humans

beryllium acetate, basic is found on the following regulatory lists

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
Chemical Footprint Project - Chemicals of High Concern List
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Group 1: Carcinogenic to humans

cadmium is found on the following regulatory lists

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
Australia Model Work Health and Safety Regulations - Hazardous chemicals (other than lead) requiring health monitoring
Australian Inventory of Industrial Chemicals (AIIC)
Chemical Footprint Project - Chemicals of High Concern List
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Group 1: Carcinogenic to humans

calcium carbonate is found on the following regulatory lists

Australian Inventory of Industrial Chemicals (AIIC)

chromic nitrate is found on the following regulatory lists

Continued...

Australia Model Work Health and Safety Regulations - Hazardous chemicals (other than lead) requiring health monitoring
Australian Inventory of Industrial Chemicals (AIIC)

cobalt is found on the following regulatory lists

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 4
Australian Inventory of Industrial Chemicals (AIIC)
Chemical Footprint Project - Chemicals of High Concern List
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Group 2B: Possibly carcinogenic to humans

copper is found on the following regulatory lists

Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 4
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 5
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 6
Australian Inventory of Industrial Chemicals (AIIC)

ferric nitrate is found on the following regulatory lists

Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 2
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 4
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 5
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 6
Australian Inventory of Industrial Chemicals (AIIC)
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Group 2A: Probably carcinogenic to humans

lead nitrate is found on the following regulatory lists

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 5
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 6
Australian Inventory of Industrial Chemicals (AIIC)
Chemical Footprint Project - Chemicals of High Concern List
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Group 2A: Probably carcinogenic to humans

magnesium nitrate is found on the following regulatory lists

Australian Inventory of Industrial Chemicals (AIIC)
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Group 2A: Probably carcinogenic to humans

manganese(II) acetate tetrahydrate is found on the following regulatory lists

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
Australian Inventory of Industrial Chemicals (AIIC)

ammonium molybdate is found on the following regulatory lists

Australian Inventory of Industrial Chemicals (AIIC)

nickel is found on the following regulatory lists

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
Australian Inventory of Industrial Chemicals (AIIC)
Chemical Footprint Project - Chemicals of High Concern List
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Group 2B: Possibly carcinogenic to humans

potassium nitrate is found on the following regulatory lists

Australian Inventory of Industrial Chemicals (AIIC)
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Group 2A: Probably carcinogenic to humans

selenium dioxide is found on the following regulatory lists

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
Australian Inventory of Industrial Chemicals (AIIC)
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs

silver nitrate is found on the following regulatory lists

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 6
Australian Inventory of Industrial Chemicals (AIIC)
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Group 2A: Probably carcinogenic to humans

sodium nitrate is found on the following regulatory lists

Australian Inventory of Industrial Chemicals (AIIC)
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Group 2A: Probably carcinogenic to humans

thallium is found on the following regulatory lists

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
Australia Model Work Health and Safety Regulations - Hazardous chemicals (other than lead) requiring health monitoring
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 7
Australian Inventory of Industrial Chemicals (AIIC)

thorium nitrate is found on the following regulatory lists

Australian Inventory of Industrial Chemicals (AIIC)
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Group 2A: Probably carcinogenic to humans

uranyl acetate is found on the following regulatory lists

Continued...

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
Australian Inventory of Industrial Chemicals (AIIC)

vanadium pentoxide is found on the following regulatory lists

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
Australian Inventory of Industrial Chemicals (AIIC)
Chemical Footprint Project - Chemicals of High Concern List
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Group 2B: Possibly carcinogenic to humans

zinc is found on the following regulatory lists

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
Australian Inventory of Industrial Chemicals (AIIC)

nitric acid is found on the following regulatory lists

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
Australian Inventory of Industrial Chemicals (AIIC)
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 5

water is found on the following regulatory lists

Australian Inventory of Industrial Chemicals (AIIC)

National Inventory Status

National Inventory	Status
Australia - AIIC / Australia Non-Industrial Use	No (beryllium acetate, basic)
Canada - DSL	No (beryllium acetate, basic)
Canada - NDSL	No (aluminium nitrate; antimony; arsenic; barium nitrate; beryllium acetate, basic; cadmium; chromic nitrate; cobalt; copper; ferric nitrate; lead nitrate; magnesium nitrate; manganese(II) acetate tetrahydrate; ammonium molybdate; nickel; potassium nitrate; selenium dioxide; silver nitrate; sodium nitrate; thallium; thorium nitrate; uranyl acetate; vanadium pentoxide; zinc; nitric acid; water)
China - IECSC	No (beryllium acetate, basic; selenium dioxide)
Europe - EINEC / ELINCS / NLP	Yes
Japan - ENCS	No (antimony; arsenic; beryllium acetate, basic; cadmium; cobalt; copper; nickel; thallium; thorium nitrate; uranyl acetate; zinc)
Korea - KECI	No (beryllium acetate, basic; uranyl acetate)
New Zealand - NZIoC	No (beryllium acetate, basic)
Philippines - PICCS	No (beryllium acetate, basic)
USA - TSCA	No (beryllium acetate, basic)
Taiwan - TCSI	Yes
Mexico - INSQ	No (beryllium acetate, basic; uranyl acetate)
Vietnam - NCI	No (beryllium acetate, basic; thorium nitrate; uranyl acetate)
Russia - FBEPH	No (beryllium acetate, basic; thorium nitrate)
Legend:	*Yes = All CAS declared ingredients are on the inventory* *No = One or more of the CAS listed ingredients are not on the inventory and are not exempt from listing(see specific ingredients in brackets)*

SECTION 16 Other information

Revision Date	30/03/2021
Initial Date	13/03/2021

SDS Version Summary

Version	Issue Date	Sections Updated
0.2.1.1.1	30/03/2021	Physical Properties

Other information

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. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

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
ES: Exposure Standard
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

Continued...

AIIC: Australian Inventory of Industrial Chemicals
DSL: Domestic Substances List
NDSL: Non-Domestic Substances List
IECSC: Inventory of Existing Chemical Substance in China
EINECS: European INventory of Existing Commercial chemical Substances
ELINCS: European List of Notified Chemical Substances
NLP: No-Longer Polymers
ENCS: Existing and New Chemical Substances Inventory
KECI: Korea Existing Chemicals Inventory
NZIoC: New Zealand Inventory of Chemicals
PICCS: Philippine Inventory of Chemicals and Chemical Substances
TSCA: Toxic Substances Control Act
TCSI: Taiwan Chemical Substance Inventory
INSQ: Inventario Nacional de Sustancias Químicas
NCI: National Chemical Inventory
FBEPH: Russian Register of Potentially Hazardous Chemical and Biological Substances

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