

# SAFETY DATA SHEET



# ILUKA

## 1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

### 1.1 Product identifier

**Product name** MONAZITE CONCENTRATE  
**Synonym(s)** MINERAL SANDS CONCENTRATE • MINERAL SEPARATION PLANT MAGNETIC ZIRCON • MONAZITE 85  
• ZIRCON CONCENTRATE

### 1.2 Uses and uses advised against

**Use(s)**  
Raw material for production of rare earth compounds.

### 1.3 Details of the supplier of the product

**Supplier name** ILUKA RESOURCES LIMITED  
**Address** Level 23, 140 St Georges Tce, Perth, WA, 6000, AUSTRALIA  
**Telephone** +61 8 9360 4700  
**Fax** +61 8 9360 4777  
**Website** <http://www.iluka.com>

### 1.4 Emergency telephone number(s)

**Emergency** +61 8 9780 3555; +61 13 11 26 (PIC)

## 2. HAZARDS IDENTIFICATION

### 2.1 Classification of the substance or mixture

CLASSIFIED AS HAZARDOUS ACCORDING TO AUSTRALIAN WHS REGULATIONS

**GHS classification(s)** Acute Toxicity: Inhalation: Category 4  
Acute Toxicity: Oral: Category 4

### 2.2 Label elements

**Signal word** WARNING

**Pictogram(s)**



### Hazard statement(s)

H302 Harmful if swallowed.  
H332 Harmful if inhaled.

### Prevention statement(s)

P261 Avoid breathing dust/fume/gas/mist/vapours/spray.  
P264 Wash thoroughly after handling.  
P270 Do not eat, drink or smoke when using this product.  
P271 Use only outdoors or in a well-ventilated area.

### Response statement(s)

P304 + P340 IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing.  
P312 Call a POISON CENTER or doctor/physician if you feel unwell.  
P330 Rinse mouth.

### Storage statement(s)

None allocated.

**PRODUCT NAME MONAZITE CONCENTRATE****Disposal statement(s)**

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

**2.3 Other hazards**

No information provided.

**3. COMPOSITION/ INFORMATION ON INGREDIENTS****3.1 Substances / Mixtures**

Ingredient	CAS Number	EC Number	Content
PHOSPHORUS PENTOXIDE	1314-56-3	215-236-1	24 to 26%
QUARTZ	14808-60-7	238-878-4	1 to 6%
URANIUM	7440-61-1	231-170-6	0.2 to 0.3%
MONAZITE	1306-41-8	-	72 to 86%
CERIUM OXIDE	1306-38-3	215-150-4	23 to 27%
LANTHANUM OXIDE	1312-81-8	215-200-5	11 to 14%
ZIRCONIUM DIOXIDE	1314-23-4	215-227-2	1 to 7%
THORIUM	7440-29-1	231-139-7	5 to 6%
ALUMINIUM OXIDE	1344-28-1	215-691-6	<5%
IRON OXIDE (FE <sub>2</sub> O <sub>3</sub> )	1309-37-1	215-168-2	<2%
TITANIUM DIOXIDE	13463-67-7	236-675-5	<2%

**4. FIRST AID MEASURES****4.1 Description of first aid measures**

<b>Eye</b>	If in eyes, hold eyelids apart and flush continuously with running water. Continue flushing until advised to stop by a Poisons Information Centre, a doctor, or for at least 15 minutes.
<b>Inhalation</b>	If inhaled, remove from contaminated area. Apply artificial respiration if not breathing.
<b>Skin</b>	If on skin (or hair), brush off loose particles and wash thoroughly. If on clothing, brush off loose particles and wash thoroughly.
<b>Ingestion</b>	For advice, contact a Poisons Information Centre or a doctor (at once). Due to product form and application, ingestion is considered unlikely.
<b>First aid facilities</b>	No information provided.

**4.2 Most important symptoms and effects, both acute and delayed**

See Section 11 for more detailed information on health effects and symptoms.

**4.3 Immediate medical attention and special treatment needed**

Treat symptomatically.

**5. FIRE FIGHTING MEASURES****5.1 Extinguishing media**

Use an extinguishing agent suitable for the surrounding fire.

**5.2 Special hazards arising from the substance or mixture**

Non flammable. May evolve toxic gases if strongly heated.

**5.3 Advice for firefighters**

No fire or explosion hazard exists.

**5.4 Hazchem code**

1WE	
1	Coarse Water Spray.
W	Risk of violent reaction or explosion. Wear liquid-tight chemical protective clothing and breathing apparatus. Contain spill and run-off.
E	Evacuation of people in and around the immediate vicinity of the incident should be considered.

## 6. ACCIDENTAL RELEASE MEASURES

### 6.1 Personal precautions, protective equipment and emergency procedures

Wear Personal Protective Equipment (PPE) as detailed in section 8 of the SDS. Clear area of all unprotected personnel. Ventilate area where possible. Contact emergency services where appropriate.

### 6.2 Environmental precautions

Prevent product from entering drains and waterways.

### 6.3 Methods of cleaning up

Collect and place in sealable containers for disposal as radioactive waste.

### 6.4 Reference to other sections

See Sections 8 and 13 for exposure controls and disposal.

## 7. HANDLING AND STORAGE

### 7.1 Precautions for safe handling

Before use carefully read the product label. Use of safe work practices are recommended to avoid eye or skin contact and inhalation. Observe good personal hygiene, including washing hands before eating. Prohibit eating, drinking and smoking in contaminated areas.

### 7.2 Conditions for safe storage, including any incompatibilities

Consult local authorities with respect to storage requirements. Store in a cool, dry, well ventilated area, removed from foodstuffs. Ensure containers are adequately labelled, protected from physical damage and sealed when not in use. Check regularly for leaks or spills.

### 7.3 Specific end use(s)

No information provided.

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

### 8.1 Control parameters

**Exposure standards** Radiation (combined alpha and gamma) exposure should be as low as reasonably achievable, (ALARA), but should not exceed a total of 100 milli-sieverts over 5 consecutive years for members of the workforce / occupationally exposed.

Ingredient	Reference	TWA		STEL	
		ppm	mg/m <sup>3</sup>	ppm	mg/m <sup>3</sup>
Aluminium oxide (a)	SWA (AUS)	--	10	--	--
Iron oxide fume (Fe <sub>2</sub> O <sub>3</sub> ) (as Fe)	SWA (AUS)	--	5	--	--
Phosphorus pentoxide	SWA (AUS)	--	--	--	--
Quartz (respirable dust)	SWA (AUS)	--	0.1	--	--
Titanium dioxide (a)	SWA (AUS)	--	10	--	--
Uranium (natural)	SWA (AUS)	--	0.2	--	0.6
Zirconium compounds	SWA (AUS)	--	5	--	10

### Biological limits

Ingredient	Determinant	Sampling Time	BEI
URANIUM	Uranium in urine	End of shift	200 µg/L

Reference: ACGIH Biological Exposure Indices

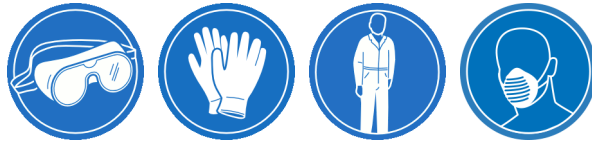
### 8.2 Exposure controls

**Engineering controls** Avoid inhalation. Use in well ventilated areas. Where an inhalation risk exists, mechanical extraction ventilation is recommended. Maintain dust levels below the recommended exposure standard.

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### PPE

<b>Eye / Face</b>	Wear safety glasses and if there is a potential for dust, wear dust-proof goggles.
<b>Hands</b>	Wear industrial grade gloves when handling material. Where heavy contamination is likely, wear PVC or rubber gloves.
<b>Body</b>	Where heavy contamination is likely, wear coveralls.
<b>Respiratory</b>	Where an inhalation risk exists, wear a Class P2 (Particulate) respirator.



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## 9. PHYSICAL AND CHEMICAL PROPERTIES

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### 9.1 Information on basic physical and chemical properties

<b>Appearance</b>	LIGHT BROWN TO YELLOW COLOURED GRANULAR SOLID
<b>Odour</b>	ODOURLESS
<b>Flammability</b>	NON FLAMMABLE
<b>Flash point</b>	NOT RELEVANT
<b>Boiling point</b>	NOT RELEVANT
<b>Melting point</b>	1900°C to 2300°C
<b>Evaporation rate</b>	NOT VOLATILE
<b>pH</b>	5 to 7.5
<b>Vapour density</b>	NOT AVAILABLE
<b>Specific gravity</b>	4.8 to 5.2
<b>Solubility (water)</b>	INSOLUBLE
<b>Vapour pressure</b>	NOT VOLATILE
<b>Upper explosion limit</b>	NOT RELEVANT
<b>Lower explosion limit</b>	NOT RELEVANT
<b>Partition coefficient</b>	NOT AVAILABLE
<b>Autoignition temperature</b>	NOT AVAILABLE
<b>Decomposition temperature</b>	NOT AVAILABLE
<b>Viscosity</b>	NOT AVAILABLE
<b>Explosive properties</b>	NOT AVAILABLE
<b>Oxidising properties</b>	NOT AVAILABLE
<b>Odour threshold</b>	NOT AVAILABLE

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## 10. STABILITY AND REACTIVITY

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### 10.1 Reactivity

Carefully review all information provided in sections 10.2 to 10.6.

### 10.2 Chemical stability

No information provided.

### 10.3 Possibility of hazardous reactions

No information provided.

### 10.4 Conditions to avoid

No information provided.

### 10.5 Incompatible materials

Compatible with most commonly used materials.

### 10.6 Hazardous decomposition products

May evolve toxic gases if heated to decomposition.

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## 11. TOXICOLOGICAL INFORMATION

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### 11.1 Information on toxicological effects

**PRODUCT NAME MONAZITE CONCENTRATE**

**Acute toxicity** Information available for the product:  
Harmful by inhalation and if swallowed.

Information available for the ingredient(s):

Ingredient	Oral Toxicity (LD50)	Dermal Toxicity (LD50)	Inhalation Toxicity (LC50)
CERIUM OXIDE	> 5 g/kg (rat)	> 2000 mg/kg (rat)	> 2.01 mg/L/4 hours
PHOSPHORUS PENTOXIDE	--	--	61 mg/m <sup>3</sup> /1 hour
LANTHANUM OXIDE	> 9968 mg/kg (rat)	--	--
URANIUM	750 mg/kg (rat)	--	--

**Skin** Not classified as a skin irritant. Contact may result in mechanical irritation.

**Eye** Not classified as an eye irritant. Contact may result in mechanical irritation.

**Sensitization** Not classified as causing skin or respiratory sensitisation.

**Mutagenicity** Not classified as a mutagen.

**Carcinogenicity** Zircon sand contains a small amount of respirable crystalline silica (up to 0.1%) and precautions should be taken to avoid inhaling the dust. The normal grain size of the product precludes it from being an inhalation hazard.

**Reproductive** Not classified as a reproductive toxin.

**STOT – single exposure** No known effects from this product.

**STOT – repeated exposure** Zircon monazite concentrate contains a small amount of respirable crystalline silica (up to 0.1%) and precautions should be taken to avoid inhaling the dust. The normal grain size of the product precludes it from being an inhalation hazard.

The zircon monazite concentrate contains naturally occurring radioactive elements of the uranium and thorium series. Low level gamma radiation from bulk or bagged stockpiles of zircon monazite concentrate can increase gamma levels above normal background.

**Aspiration** This product does not present an aspiration hazard.

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## 12. ECOLOGICAL INFORMATION

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### 12.1 Toxicity

No information provided.

### 12.2 Persistence and degradability

No information provided.

### 12.3 Bioaccumulative potential

No information provided.

### 12.4 Mobility in soil

No information provided.

### 12.5 Other adverse effects

No information provided.

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## 13. DISPOSAL CONSIDERATIONS

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### 13.1 Waste treatment methods

**Waste disposal** Contact local authorities with respect to the disposal of radioactive wastes. Contact the responsible Radiation Safety Officer for additional information.

**Legislation** Dispose of in accordance with relevant local legislation.

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## 14. TRANSPORT INFORMATION

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CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE



	<b>LAND TRANSPORT (ADG)</b>	<b>SEA TRANSPORT (IMDG / IMO)</b>	<b>AIR TRANSPORT (IATA / ICAO)</b>
<b>14.1 UN Number</b>	2912	2912	2912
<b>14.2 Proper Shipping Name</b>	RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-I), non fissile or fissile-excepted	RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-I), non fissile or fissile-excepted	RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-I), non fissile or fissile-excepted
<b>14.3 Transport hazard class</b>	7	7	7
<b>14.4 Packing Group</b>	None Allocated	None Allocated	None Allocated

**14.5 Environmental hazards** No information provided

**14.6 Special precautions for user**

**Hazchem code** 1WE  
**GTEPG** REFER  
**EMS** F-I, S-S

**Other information** Australian transport is regulated by:  
 ARPANSA "Code of Practice for the Safe Transport of Radioactive Material, 2001"  
 Australian Dangerous Goods (ADG) Code

Transport vehicles should be covered and tailgates sealed to prevent dispersion of dust when bulk materials are transported. Vehicles should be washed down after use.

**15. REGULATORY INFORMATION**

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

**Poison schedule** A poison schedule number has not been allocated to this product using the criteria in the Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP).

**Classifications** Safework Australia criteria is based on the Globally Harmonised System (GHS) of Classification and Labelling of Chemicals.

The classifications and phrases listed below are based on the Approved Criteria for Classifying Hazardous Substances [NOHSC: 1008(2004)].

**Hazard codes** Xn Harmful

**Risk phrases** R20/22 Harmful by inhalation and if swallowed.

**Safety phrases** S22 Do not breathe dust.  
 S24/25 Avoid contact with skin and eyes.  
 S26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice  
 S28 After contact with skin, wash immediately with plenty of water.  
 S36/37/39 Wear suitable protective clothing, gloves and eye/face protection.  
 S44 If you feel unwell, contact a doctor or Poisons Information Centre immediately (show label where possible).  
 S62 If swallowed, do not induce vomiting; seek medical advice immediately and show this container or label.

**Inventory listing(s)** **AUSTRALIA: AICS (Australian Inventory of Chemical Substances)**  
 All components are listed on AICS, or are exempt.

**16. OTHER INFORMATION**

**Additional information** RADIOACTIVE COMPOUNDS - ALPHA EMITTERS: Alpha radiation is emitted by radioactive materials as they decay. Alpha radiation does not penetrate below the outer layer of skin. Restrict all potential routes of internal exposure by inhalation, ingestion and contact with open wounds.

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**RADIOACTIVE COMPOUNDS - GAMMA EMITTERS:** Gamma radiation is emitted by radioactive materials as they decay. Gamma radiation penetrates the body and a distance in air. Based on the measured emission level of a gamma radiation source, warning signs may be required for identification. Reduction to gamma radiation exposure is achieved by increasing distance from the source, a reduction of the time in contact with the source and by the use of a shield made from lead, concrete or thick steel between a person and the source.

**RESPIRATORS:** In general the use of respirators should be limited and engineering controls employed to avoid exposure. If respiratory equipment must be worn ensure correct respirator selection and training is undertaken. Remember that some respirators may be extremely uncomfortable when used for long periods. The use of air powered or air supplied respirators should be considered where prolonged or repeated use is necessary.

### PERSONAL PROTECTIVE EQUIPMENT GUIDELINES:

The recommendation for protective equipment contained within this report is provided as a guide only. Factors such as method of application, working environment, quantity used, product concentration and the availability of engineering controls should be considered before final selection of personal protective equipment is made.

### HEALTH EFFECTS FROM EXPOSURE:

It should be noted that the effects from exposure to this product will depend on several factors including: frequency and duration of use; quantity used; effectiveness of control measures; protective equipment used and method of application. Given that it is impractical to prepare a ChemAlert report which would encompass all possible scenarios, it is anticipated that users will assess the risks and apply control methods where appropriate.

### Abbreviations

ACGIH	American Conference of Governmental Industrial Hygienists
CAS #	Chemical Abstract Service number - used to uniquely identify chemical compounds
CNS	Central Nervous System
EC No.	EC No - European Community Number
EMS	Emergency Schedules (Emergency Procedures for Ships Carrying Dangerous Goods)
GHS	Globally Harmonized System
GTEPG	Group Text Emergency Procedure Guide
IARC	International Agency for Research on Cancer
LC50	Lethal Concentration, 50% / Median Lethal Concentration
LD50	Lethal Dose, 50% / Median Lethal Dose
mg/m <sup>3</sup>	Milligrams per Cubic Metre
OEL	Occupational Exposure Limit
pH	relates to hydrogen ion concentration using a scale of 0 (high acidic) to 14 (highly alkaline).
ppm	Parts Per Million
STEL	Short-Term Exposure Limit
STOT-RE	Specific target organ toxicity (repeated exposure)
STOT-SE	Specific target organ toxicity (single exposure)
SUSMP	Standard for the Uniform Scheduling of Medicines and Poisons
SWA	Safe Work Australia
TLV	Threshold Limit Value
TWA	Time Weighted Average

### Report status

This document has been compiled by RMT on behalf of the manufacturer, importer or supplier of the product and serves as their Safety Data Sheet ('SDS').

It is based on information concerning the product which has been provided to RMT by the manufacturer, importer or supplier or obtained from third party sources and is believed to represent the current state of knowledge as to the appropriate safety and handling precautions for the product at the time of issue. Further clarification regarding any aspect of the product should be obtained directly from the manufacturer, importer or supplier.

While RMT has taken all due care to include accurate and up-to-date information in this SDS, it does not provide any warranty as to accuracy or completeness. As far as lawfully possible, RMT accepts no liability for any loss, injury or damage (including consequential loss) which may be suffered or incurred by any person as a consequence of their reliance on the information contained in this SDS.

**PRODUCT NAME MONAZITE CONCENTRATE**

**Prepared by**

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