

SAFETY DATA SHEET



ILUKA

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

Product identifier

Product name ZIRCON MONAZITE CONCENTRATE

Synonyms MINERAL SANDS CONCENTRATE • MINERAL SEPARATION PLANT MAGNETIC ZIRCON • MONAZITE 50 • MONAZITE CONCENTRATE • ZIRCON CONCENTRATE

Uses and uses advised against

Uses RAW MATERIAL FOR PRODUCTION OF RARE EARTH COMPOUNDS

Details of the supplier of the product

Supplier name ILUKA RESOURCES LIMITED

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Emergency telephone numbers

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2. HAZARDS IDENTIFICATION

Emergency overview

Light brown to yellow coloured granular solid. May be harmful if swallowed.

Classification of the substance or mixture

GHS classifications Acute Toxicity: Oral: Category 5

GHS Label elements

Signal word WARNING

Pictograms

None allocated.

Hazard statements

H303 May be harmful if swallowed.

Prevention statements

None allocated.

Response statements

P312 Call a POISON CENTER or doctor/physician if you feel unwell.

Storage statements

None allocated.

Disposal statements

None allocated.

Other hazards

No information provided.

3. COMPOSITION/ INFORMATION ON INGREDIENTS

PRODUCT NAME ZIRCON MONAZITE CONCENTRATE**Substances / Mixtures**

Ingredient	CAS Number	EC Number	Content
PHOSPHORUS PENTOXIDE	1314-56-3	215-236-1	14 to 21%
CERIUM OXIDE	1306-38-3	215-150-4	14 to 20%
QUARTZ (CRYSTALLINE SILICA)	14808-60-7	238-878-4	9 to 12%
ALUMINIUM OXIDE	1344-28-1	215-691-6	1 to 10%
LANTHANUM OXIDE	1312-81-8	215-200-5	7 to 10%
TITANIUM DIOXIDE	13463-67-7	236-675-5	1 to 9%
IRON OXIDE (FE2O3)	1309-37-1	215-168-2	2 to 5%
URANIUM	7440-61-1	231-170-6	0.1 to 0.2%
MONAZITE	1306-41-8	-	46 to 62%
ZIRCONIUM DIOXIDE	1314-23-4	215-227-2	8 to 20%
THORIUM	7440-29-1	231-139-7	3 to 5%

4. FIRST AID MEASURES

Description of first aid measures

Eye	If in eyes, rinse cautiously with water for several minutes, or until particle is removed. Remove contact lenses if present and easy to do - continue rinsing.
Inhalation	If inhaled move to fresh air and keep comfortable.
Skin	If skin or hair contact occurs, brush off loose particles. If on clothing, brush off loose particles. If irritation occurs, seek medical advice.
Ingestion	If swallowed, rinse mouth and get medical attention if you feel unwell.
First aid facilities	Eye wash facilities should be available.

Most important symptoms and effects, both acute and delayed

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

Specific advice for doctors

Treat symptomatically.

5. FIRE FIGHTING MEASURES

Extinguishing media

Use an extinguishing agent suitable for the surrounding fire.

Special hazards arising from the substance or mixture

Non flammable. May evolve toxic gases if strongly heated.

Precautions and protective measures for fire fighting

No fire or explosion hazard exists.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Wear Personal Protective Equipment (PPE) as detailed in section 8 of the SDS. Contact emergency services where appropriate.

Environmental precautions

Prevent product from entering drains and waterways.

Methods of cleaning and suggested disposal materials

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

Reference to other sections

See Sections 8 and 13 for exposure controls and disposal.

7. HANDLING AND STORAGE

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.

Conditions for safe storage

Store in a well ventilated area, removed from incompatible substances and foodstuffs. Ensure containers are adequately labelled, protected from physical damage and sealed when not in use. When stockpiled, ensure leachate and runoff cannot enter drains or waterways.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

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 ³	ppm	mg/m ³
Aluminium oxide (a)	SWA (AUS)	--	10	--	--
Iron oxide fume (Fe ₂ O ₃) (as Fe)	SWA (AUS)	--	5	--	--
Phosphorus pentoxide	NHFPC (China)	--	1 (Peak)	--	--
Phosphorus pentoxide	SWA (AUS)	--	--	--	--
Respirable Crystalline Silica	OSHA PEL (US)	--	0.05	--	--
Titanium dioxide (a)	SWA (AUS)	--	10	--	--
Uranium (natural)	SWA (AUS)	--	0.2	--	0.6
Zirconium and compounds, as Zr	NHFPC (China)	--	5	--	10
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

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. 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.

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.

PRODUCT NAME ZIRCON MONAZITE CONCENTRATE

Personal protective equipment

Eye / Face	Wear safety glasses and if there is a potential for dust, wear dust-proof goggles.
Hands	Wear industrial grade gloves when handling material. Where heavy contamination is likely, wear PVC or rubber gloves.
Body	Where heavy contamination is likely, wear coveralls.
Respiratory	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.



9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

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

10. STABILITY AND REACTIVITY

Chemical stability

Stable under recommended conditions of storage.

Possibility of hazardous reactions

Polymerization is not expected to occur.

Conditions to avoid

No information provided.

Incompatible materials

None in normal or expected use.

Hazardous decomposition products

May evolve toxic gases when heated to decomposition.

11. TOXICOLOGICAL INFORMATION

Acute toxicity May be harmful if swallowed.

PRODUCT NAME ZIRCON MONAZITE CONCENTRATE**Information available for the ingredients:**

Ingredient	Oral LD50	Dermal LD50	Inhalation LC50
PHOSPHORUS PENTOXIDE	--	--	61 mg/m ³ /1 hour (guinea pig)
CERIUM OXIDE	> 5 g/kg (rat)	> 2000 mg/kg (rat)	> 2.01 mg/L/4 hours (rat)
ALUMINIUM OXIDE	> 5000 mg/kg (rat)	--	--
LANTHANUM OXIDE	> 9968 mg/kg (rat)	--	--
TITANIUM DIOXIDE	5000 mg/kg (rat)	--	3.43 - 6.82 mg/L air (rat)
URANIUM	750 mg/kg (rat)	--	--

Skin corrosion/irritation	Not classified as a skin irritant. Contact may result in mechanical irritation.
Eye damage or irritation	Not classified as an eye irritant. Contact may result in mechanical irritation.
Respiration or skin sensitisation	Not classified as causing skin or respiratory sensitisation.
Mutagenicity	Not classified as a mutagen.
Carcinogenicity	This product contains a small amount of respirable crystalline silica and precautions should be taken to avoid inhaling the dust. Crystalline silica is classified as carcinogenic to humans (IARC Group 1). The normal grain size of the product precludes it from being an inhalation hazard.
Reproductive toxic STOT - single exposure	Not classified as a reproductive toxin. No known effects from this product.
STOT - repeated exposure	The normal grain size of the product precludes it from being an inhalation hazard. This product contains a small amount of respirable crystalline silica and precautions should be taken to avoid inhaling the dust. Radiation: This product contains low levels of naturally occurring radioactive elements of the uranium and thorium series. Low level gamma radiation from bulk or bagged stockpiles of this product can increase gamma levels slightly above normal background.
Aspiration hazard	This product does not present an aspiration hazard.

12. ECOLOGICAL INFORMATION**Toxicity**

No information provided.

Persistence and degradability

No information provided.

Bioaccumulative potential

No information provided.

Mobility in soil

No information provided.

13. DISPOSAL CONSIDERATIONS

Waste materials and contaminated packaging	Disposal must be in accordance with Federal, State and Local Council regulations. If approved, may be transferred to an approved landfill site. Many states are developing new regulations for the disposal of waste containing Naturally Occurring Radioactive Materials (NORM) or Technologically Enhanced Naturally Occurring Radioactive Materials (TENORM) above background levels. Consult and comply with current regulations.
Disposal considerations	Dispose of in accordance with relevant local legislation.

14. TRANSPORT INFORMATION**CLASSIFIED AS A DANGEROUS GOOD FOR TRANSPORT**



	LAND TRANSPORT (CNDG)	SEA TRANSPORT (IMDG / IMO)	AIR TRANSPORT (IATA / ICAO)
UN Number	2912	2912	2912
Proper Shipping Name	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
Transport hazard class	7	7	7
Packing Group	None allocated.	None allocated.	None allocated.

Environmental hazards

No information provided.

Special precautions for user

EMS

F-I, S-S

15. REGULATORY INFORMATION

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

Regulation	Ingredient(s)	Listed
Catalog of Hazardous Chemicals (2015)	PHOSPHORUS PENTOXIDE	Listed
Inventory of Existing Chemical Substance in China (IECSC)	ALUMINIUM OXIDE	Listed
	CERIUM OXIDE	Listed
	IRON OXIDE (FE2O3)	Listed
	LANTHANUM OXIDE	Listed
	MONAZITE	
	PHOSPHORUS PENTOXIDE	Listed
	QUARTZ (CRYSTALLINE SILICA)	Listed
	THORIUM TITANIUM DIOXIDE	Listed
List of Hazardous Chemicals for Priority Management - Precursors	URANIUM ZIRCONIUM DIOXIDE	
	PHOSPHORUS PENTOXIDE	Not Listed
List of Toxic Chemicals Restricted to be Imported/Exported - Priority Management	PHOSPHORUS PENTOXIDE	Not Listed

16. OTHER INFORMATION

Additional information

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 form of product, 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: form of product; 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 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
IARC	International Agency for Research on Cancer
LC50	Lethal Concentration, 50% / Median Lethal Concentration
LD50	Lethal Dose, 50% / Median Lethal Dose
mg/m ³	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)
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.

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