# SAFETY DATA SHEET

## 1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

### 1.1 Product identifier

**Product name** **MINERAL SANDS CONCENTRATE**

**Synonyms** ILMENITE ZIRCON MONAZITE CONCENTRATE ● MONAZITE 20

### 1.2 Uses and uses advised against

**Uses** RAW MATERIAL FOR PRODUCTION OF RARE EARTH COMPOUNDS

### 1.3 Details of the supplier of the product

**Supplier name** **ILUKA RESOURCES LIMITED**

**Address** Level 17, 240 St Georges Terrace, Perth, WA, 6000, AUSTRALIA

**Telephone** +61 8 9360 4700

**Fax** +61 8 9360 4777

**Website** http://www.iluka.com

### 1.4 Emergency telephone numbers

**Emergency** +61 8 9360 4700 (8:00 to 17:00 AWST)

**Poison Information Centre** 13 11 26

## 2. HAZARDS IDENTIFICATION

### 2.1 Classification of the substance or mixture

NOT CLASSIFIED AS HAZARDOUS ACCORDING TO SAFE WORK AUSTRALIA CRITERIA

**Physical Hazards**

Not classified as a Physical Hazard

**Health Hazards**

Acute Toxicity: Oral: Category 5

**Environmental Hazards**

Not classified as an Environmental Hazard

### 2.2 GHS Label elements

**Signal word** **WARNING**

**Pictograms**

**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.

### 2.3 Other hazards
No information provided.

## 3. COMPOSITION/ INFORMATION ON INGREDIENTS

### 3.1 Substances / Mixtures

| Ingredient | CAS Number | EC Number | Content |
|---|---|---|---|
| ZIRCON | 14940-68-2 | 239-019-6 | 20 to 25% |
| XENOTIME | 13817-22-6 | - | <5% |
| ILMENITE | 98072-94-7 | 308-551-1 | 30 to 40% |
| MONAZITE | 1306-41-8 | - | 15 to 25% |
| ALUMINOSILICATE | 1302-93-8 | 215-113-2 | 5 to 15% |

## 4. FIRST AID MEASURES

### 4.1 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.

### 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
None allocated.

## 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. 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 reuse or 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

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.

### 7.3 Specific end uses

No information provided.

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

### 8.1 Control parameters

**Exposure standards**

| Ingredient | Reference | TWA | | STEL | |
|---|---|---|---|---|---|
| | | ppm | mg/m³ | ppm | mg/m³ |
| Nuisance Dust | SWA [AUS] | -- | 10 | -- | -- |
| Zirconium compounds | SWA [AUS] | -- | 5 | -- | 10 |
| Zirconium compounds (as Zr) | SWA [AUS] | -- | 5 | -- | 10 |

**Biological limits**

No biological limit values have been entered for this product.

### 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.

**PPE**

**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

### 9.1 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 |

### 9.1 Information on basic physical and chemical properties

| | |
|---|---|
| **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

### 10.1 Reactivity

Carefully review all information provided in sections 10.2 to 10.6

### 10.2 Chemical stability

Stable under recommended conditions of storage.

### 10.3 Possibility of hazardous reactions

Polymerization is not expected to occur.

### 10.4 Conditions to avoid

No information provided.

### 10.5 Incompatible materials

None in normal or expected use.

### 10.6 Hazardous decomposition products

May evolve toxic gases when heated to decomposition.

## 11. TOXICOLOGICAL INFORMATION

### 11.1 Information on toxicological effects

| | |
|---|---|
| **Acute toxicity** | Non-toxic. There are no known hazards resulting from accidental ingestion of this product as may occur during normal handling. Ingestion of large quantities may cause irritation to the gastrointestinal system, mainly as a result of abrasion. |
| **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. |
| **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. Zircon, monazite and xenotime are slightly radioactive due to the presence of natural uranium and its daughter products which produce low levels of alpha particles and gamma rays. Although this radiation is classified as low level, unnecessary exposure to the product should be avoided. Some human data indicates that uranium compounds may lead to lung and bone cancers. These deposits also contain low levels of thorium, which is classified as a confirmed human carcinogen (IARC Group 1). |
| **Reproductive** | Not classified as a reproductive toxin. Radioactive materials are known to cause reproductive effects. |
| **STOT - single exposure** | 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** | This product does not present an aspiration hazard. |

## 12. ECOLOGICAL INFORMATION

### 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.

## 13. DISPOSAL CONSIDERATIONS

### 13.1 Waste treatment methods

**Waste disposal** 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.

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

## 14. TRANSPORT INFORMATION

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


| | LAND TRANSPORT (ADG) | SEA TRANSPORT (IMDG / IMO) | AIR TRANSPORT (IATA / ICAO) |
|---|---|---|---|
| **14.1 UN Number** | 2912 | 2912 | 2912 |
| **14.2 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 |
| **14.3 Transport hazard class** | 7 | 7 | 7 |
| **14.4 Packing Group** | None allocated. | None allocated. | None allocated. |

### 14.5 Environmental hazards
Not a Marine Pollutant

### 14.6 Special precautions for user

**Hazchem code** None allocated.

**GTEPG** REFER

**EMS** F-I, S-S

## 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.

**Inventory listings** **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.

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.

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 |
| 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/m³ | 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.

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