# SAFETY DATA SHEET

## 1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

### 1.1 Product identifier

**Product name** **MAK-RACODDIG**

**Synonyms** MAK-RACODDIG

### 1.2 Uses and uses advised against

**Uses** ANALYTICAL CHEMISTRY ● LABORATORY APPLICATIONS ● LABORATORY REAGENT

### 1.3 Details of the supplier of the product

**Supplier name** **MAK INDUSTRIAL WATER SOLUTIONS PTY LTD**

**Address** 36 Beringarra Ave, Malaga, Western Australia, 6090, AUSTRALIA

**Telephone** +61 8 9249 8007

**Fax** +61 8 9249 8004

**Email** service.wa@makwater.com.au

**Website** http://makwater.com.au

### 1.4 Emergency telephone numbers

**Emergency** +61 8 9249 8007

## 2. HAZARDS IDENTIFICATION

### 2.1 Classification of the substance or mixture

CLASSIFIED AS HAZARDOUS ACCORDING TO SAFE WORK AUSTRALIA CRITERIA

**Physical Hazards**

Not classified as a Physical Hazard

**Health Hazards**

Acute Toxicity: Oral: Category 3
Acute Toxicity: Skin: Category 3
Skin Corrosion/Irritation: Category 1A
Serious Eye Damage / Eye Irritation: Category 1
Acute Toxicity: Inhalation: Category 3
Specific Target Organ Toxicity (Repeated Exposure): Category 2

**Environmental Hazards**

Aquatic Toxicity (Chronic): Category 1

### 2.2 GHS Label elements

**Signal word** **DANGER**

**Pictograms**

**Hazard statements**

| | |
|---|---|
| H301 | Toxic if swallowed. |
| H311 | Toxic in contact with skin. |
| H314 | Causes severe skin burns and eye damage. |
| H318 | Causes serious eye damage. |
| H331 | Toxic if inhaled. |
| H373 | May cause damage to organs through prolonged or repeated exposure. |
| H410 | Very toxic to aquatic life with long lasting effects. |

**Prevention statements**

| | |
|---|---|
| P260 | Do not breathe 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. |
| P273 | Avoid release to the environment. |
| P280 | Wear protective gloves/protective clothing/eye protection/face protection/hearing protection. |

**Response statements**

| | |
|---|---|
| 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/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. |
| P310 | Immediately call a POISON CENTRE or doctor/physician. |
| P314 | Get medical advice/attention if you feel unwell. |
| P321 | Specific treatment is advised - see first aid instructions. |
| P361 + P364 | Take off immediately all contaminated clothing and wash it before reuse. |
| P363 | Wash contaminated clothing before reuse. |
| P391 | Collect spillage. |

**Storage statements**

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

**Disposal statements**

| | |
|---|---|
| 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 |
|---|---|---|---|
| SULPHURIC ACID | 7664-93-9 | 231-639-5 | 80 to 90% |
| SILVER SULPHATE | 10294-26-5 | 233-653-7 | 0.5 to 3% |
| MERCURY (II) SULPHATE | 7783-35-9 | 231-992-5 | 0.1 to 1% |
| CHROMIC (VI) ACID | 13530-68-2 | 236-881-5 | 0.01 to 0.1% |
| WATER | 7732-18-5 | 231-791-2 | 15 to 25% |

## 4. FIRST AID MEASURES

### 4.1 Description of first aid measures

**Eye** 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.

**Inhalation** If inhaled, remove from contaminated area. To protect rescuer, use a Full-face Type B (Inorganic and acid gas) respirator or an Air-line respirator (in poorly ventilated areas). Apply artificial respiration if not breathing.

**Skin** If skin or hair contact occurs, remove contaminated clothing and flush skin and hair with running water. Continue flushing with water until advised to stop by a Poisons Information Centre or a doctor.

**Ingestion** For advice, contact a Poisons Information Centre on 13 11 26 (Australia Wide) or a doctor (at once). If swallowed, do not induce vomiting.

**First aid facilities** Eye wash facilities and safety shower 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 (sulphur/ mercury oxides) when heated to decomposition. May evolve flammable hydrogen gas in contact with some metals.

### 5.3 Advice for firefighters
Evacuate area and contact emergency services. Toxic gases may be evolved in a fire situation. Remain upwind and notify those downwind of hazard. Wear full protective equipment including Self Contained Breathing Apparatus (SCBA) when combating fire. Use waterfog to cool intact containers and nearby storage areas.

### 5.4 Hazchem code
2P

| | |
|---|---|
| 2 | Fine Water Spray. |
| P | Risk of violent reaction or explosion. Wear liquid-tight chemical protective clothing and breathing apparatus. Dilute spill and run-off. |

## 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
Contain spillage, then cover / absorb spill with sodium bicarbonate or 50-50 mixture of sodium carbonate and calcium hydroxide. Collect for complete neutralisation and appropriate disposal.

### 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 secured, cool, dry, well ventilated area, removed from incompatible substances, heat or ignition sources and foodstuffs. Ensure containers are adequately labelled and protected from physical damage when not in use. Check regularly for leaks or spills. Large storage areas should have appropriate ventilation and fire protection systems.

### 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 |
| Chromium (VI) (as Cr) | SWA [Proposed] | -- | 7E-6 | -- | -- |
| Chromium (VI) compounds (as Cr) | SWA [AUS] | -- | 0.05 | -- | -- |
| Mercury, inorganic divalent compounds (as Hg) | SWA [AUS] | 0.003 | 0.025 | -- | -- |
| Silver, metal | SWA [AUS] | -- | 0.1 | -- | -- |
| Sulphuric acid | SWA [AUS] | -- | 1 | -- | 3 |
| Sulphuric acid | SWA [Proposed] | -- | 0.1 | -- | -- |

**Biological limits**

| Ingredient | Determinant | Sampling Time | BEI |
|---|---|---|---|
| CHROMIC (VI) ACID | Total chromium in urine | End of shift at end of workweek | 25 µg/L |
| | Total chromium in urine | Increase during shift | 10 µg/L |
| | Total chromium in urine | Post shift | 10 µmol chromium/mol creatinine in urine |
| | Total chromium in urine | End of shift at end of workweek | 30 µg/L |
| | Total chromium in urine | End of shift at end of workweek | 25 µg/L |

Reference: ACGIH Biological Exposure Indices

### 8.2 Exposure controls

**Engineering controls** Avoid inhalation. In a laboratory situation use under a fume cupboard or other localised extraction ventilation equipment. Maintain vapour levels below the recommended exposure standard.

**PPE**

**Eye / Face** Wear a faceshield and splash-proof goggles.

**Hands** Wear PVC or rubber gloves.

**Body** Wear coveralls. When using large quantities or where heavy contamination is likely, wear rubber boots and a PVC apron. In a laboratory situation, wear a laboratory coat.

**Respiratory** Where an inhalation risk exists, wear a Type B-Class P2 (Inorganic gases/vapors and Particulate) respirator or a Type Hg (mercury) - Half facepiece respirator. At high vapour levels, wear an Air-line respirator.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

### 9.1 Information on basic physical and chemical properties

| | |
|---|---|
| **Appearance** | TURBID LIGHT ORANGE LIQUID |
| **Odour** | SLIGHT ODOUR |
| **Flammability** | NON FLAMMABLE |
| **Flash point** | NOT RELEVANT |
| **Boiling point** | 105°C (Approximately) |
| **Melting point** | NOT AVAILABLE |
| **Evaporation rate** | NOT AVAILABLE |
| **pH** | < 0.5 |
| **Vapour density** | NOT AVAILABLE |
| **Relative density** | 1.78 (Approximately) |
| **Solubility (water)** | SOLUBLE |

### 9.1 Information on basic physical and chemical properties

| | |
|---|---|
| **Vapour pressure** | NOT AVAILABLE |
| **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

Potential for exothermic hazard.

### 10.3 Possibility of hazardous reactions

Hazardous polymerisation is not expected to occur.

### 10.4 Conditions to avoid

Avoid heat, sparks, open flames and other ignition sources.

### 10.5 Incompatible materials

Incompatible with oxidising agents (e.g. hypochlorites), alkalis (e.g. sodium hydroxide) and some metals.

### 10.6 Hazardous decomposition products

May evolve toxic gases (sulphur/ mercury oxides) when heated to decomposition.

## 11. TOXICOLOGICAL INFORMATION

### 11.1 Information on toxicological effects

**Acute toxicity** Toxic if swallowed, in contact with skin or if inhaled. Ingestion may result in severe burns of the mouth and throat, as well as a danger of perforation of the oesophagus and the stomach.

**Information available for the ingredients:**

| Ingredient | Oral LD50 | Dermal LD50 | Inhalation LC50 |
|---|---|---|---|
| SULPHURIC ACID | 2140 mg/kg (rat) | -- | 18 mg/m³ (guinea pig); 510 mg/m3/2hrs (rat) |
| MERCURY (II) SULPHATE | 25 mg/kg (mouse) | 625 mg/kg (rat) | -- |

**Skin** Causes severe burns. Contact may result in irritation, redness, pain, rash, dermatitis, blistering and severe burns. May cause discolouration of the skin. Effects may be delayed.

**Eye** Causes severe burns. Contact may result in irritation, lacrimation, pain, redness, corneal burns and serious eye damage.

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

**Mutagenicity** Insufficient data available to classify as a mutagen.

**Carcinogenicity** Occupational exposure to strong inorganic acid mists containing sulphuric acid is classified as carcinogenic to humans (IARC Group 1).

**Reproductive** May damage fertility or the unborn child. Mercury can cross the placental barrier, causing birth defects including mental retardation, ataxia, constriction of the visual field, blindness, and cerebral palsy.

**STOT - single exposure** Over exposure may result in mucous membrane irritation of the respiratory tract, coughing, bronchitis, ulceration, bloody nose, lung tissue damage and deterioration of pulmonary function. High level exposure to mercury may result in tightness in the chest, nausea, vomiting, breathing difficulties, metallic taste, bronchitis and chemical pneumonitis.

**STOT - repeated exposure** Mercury is a cumulative poison and may result in damage to the CNS and kidneys.

**Aspiration** Not classified as causing aspiration.

## 12. ECOLOGICAL INFORMATION

### 12.1 Toxicity

Very toxic to aquatic life with long lasting effects.

### 12.2 Persistence and degradability

Mercury and its compounds are highly persistent in water and the environment.

### 12.3 Bioaccumulative potential

Mercury and its compounds are highly persistent in water and the environment and will bioaccumulate or concentrate in the tissues of fish. These concentrations will be considerably higher than the water from which the fish is taken.

### 12.4 Mobility in soil

Mercury is an element and does not breakdown in soil.

### 12.5 Other adverse effects

Sulphuric acid is harmful to aquatic life in very low concentrations. It may cause corrosion and deterioration of many common materials found in the environment. Mercury is converted to methyl mercury by bacteria in the environment. Methyl mercury is dangerous and may accumulate in fish and move through the food chain to humans. It is removed very slowly and has the potential to bioaccumulate.

## 13. DISPOSAL CONSIDERATIONS

### 13.1 Waste treatment methods

**Waste disposal** Wearing the protective equipment detailed above, neutralise to pH 6-8 by SLOW addition to a saturated sodium bicarbonate solution or similar basic solution. Remove mercury compounds by dissolving (insoluble salts should be converted to soluble nitrates). Adjust the acidity and precipitate as mercuric sulphide using hydrogen sulphide. Once the mercury is removed, absorb the residual liquid with sand or similar, collect and dispose of to an approved landfill site.

**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** | 1830 | 1830 | 1830 |
| **14.2 Proper Shipping Name** | SULFURIC ACID with more than 51% acid | SULFURIC ACID with more than 51% acid | SULFURIC ACID with more than 51% acid |
| **14.3 Transport hazard class** | 8 | 8 | 8 |
| **14.4 Packing Group** | II | II | II |

### 14.5 Environmental hazards

Marine Pollutant.

### 14.6 Special precautions for user

**Hazchem code** 2P

**GTEPG** 8A2

**EmS** F-A, S-B

## 15. REGULATORY INFORMATION

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

**Poison schedule** Classified as a Schedule 6 (S6) Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP).

**Classifications** Safe Work Australia criteria is based on the Globally Harmonised System (GHS) of Classification and Labelling of Chemicals (GHS Revision 7).

**Inventory listings**

**AUSTRALIA: AIIC (Australian Inventory of Industrial Chemicals)**
All components are listed on AIIC, or are exempt.
**UNITED STATES: TSCA (US Toxic Substances Control Act)**
All components are listed on the TSCA inventory, or are exempt.

## 16. OTHER INFORMATION

**Additional information**

ACIDS: When mixing acids with water (diluting), caution must be taken as heat will be generated which causes violent spattering. Always add a small volume of acid to a large volume of water, NEVER the reverse.

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.

IARC GROUP 1 - CONFIRMED HUMAN CARCINOGEN. This product contains an ingredient for which there is sufficient evidence to have been classified by the International Agency for Research into Cancer as a human carcinogen. The use of products known to be human carcinogens should be strictly monitored and controlled.

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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