**Zirconium Hydroxide:** MELCat, Isolux, MELSorb, 302M

**Safety Data Sheet**


Date of issue: 19/08/2013

**SECTION 1: Identification of the substance/mixture and of the company/undertaking**

1. **Product identifier**

<table>
<thead>
<tr>
<th>Product form</th>
<th>Substance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Substance name</td>
<td>Zirconium Hydroxide</td>
</tr>
<tr>
<td>Trade names</td>
<td>MELCat, Isolux, MELSorb, 302M</td>
</tr>
<tr>
<td>EC no</td>
<td>238-472-7</td>
</tr>
<tr>
<td>CAS No</td>
<td>14475-63-9</td>
</tr>
<tr>
<td>Formula</td>
<td>H4O4Zr</td>
</tr>
<tr>
<td>Product group</td>
<td>Trade product</td>
</tr>
</tbody>
</table>

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

1.2.1. Relevant identified uses

Use of the substance/mixture: Catalyst

1.2.2. Uses advised against

No additional information available

1.3. Details of the supplier of the safety data sheet

MEL Chemicals
P.O. Box 6 Lumns Lane Swinton
Manchester M27 8LS - England
T +44 (0) 161 911 1100
F +44 (0) 161 911 1099
melchemsales@melchemicals.com
www.zrchem.com

International Manufacturers / Importers

**United States**

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500 Barbertown Point Breeze Road
Flemington, NJ 08822-9111
USA
melchemsales@melchemicals.com
www.zrchem.com

**Australia**

Achemtech Co. Ltd
445-160, 26-21
Dongtanjungssimsangga s gil
Hwaseong Si
Gyeonggi-Do
South Korea
T 82-31-372-8090

**South Korea**

Achemtech Co. Ltd
445-160, 26-21
Dongtanjungssimsangga s gil
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Gyeonggi-Do
South Korea
T 82-31-372-8090

1.4. Emergency telephone number

Emergency number: +44 (0) 161 911 1100 (MEL Chemicals)
+1 800 424 9300 (CHEMTREC United States 24 hrs/7 days)
+1 (703) 527-3887 (CHEMTREC International 24 hrs/7 days)
+44 (0) 1865 407333 (Global Service)

**SECTION 2: Hazards identification**

2.1. Classification of the substance or mixture

Classification in accordance with GHS regulations referenced above
Not classified

Classification in accordance with Canadian WHMIS
Not classified
Zirconium Hydroxide: MELCat, Isolux, MELSorb, 302M
Safety Data Sheet
according to GHS

2.2. Label elements

GHS Labelling
No labelling applicable

Labeling according to Canadian WHMIS
No labelling applicable

2.3. Other hazards
No additional information

2.4. Unknown acute toxicity
No unknown acute toxicities.

SECTION 3: Composition/information on ingredients

3.1. Substances
Substance type: Mono-constituent
Name: Zirconium Hydroxide
CAS No: 14475-63-9

<table>
<thead>
<tr>
<th>Name</th>
<th>Product identifier</th>
<th>%</th>
<th>Classification (GHS): (US, Mexico, Japan, Korea, Australia, South Africa, Brazil, China, Indonesia, Thailand)</th>
<th>Classification Canadian WHMIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zirconium tetrahydroxide</td>
<td>(CAS No) 14475-63-9 (KECI no) KE-36556</td>
<td>90 - 100</td>
<td>Not classified</td>
<td>Not classified</td>
</tr>
</tbody>
</table>

Full text of R-, H- and EUH-phrases: see section 16

3.2. Mixture
Not applicable

SECTION 4: First aid measures

4.1. Description of first aid measures
First-aid measures after inhalation: If inhaled and if breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing. If you feel unwell, seek medical advice.
First-aid measures after skin contact: Gently wash with plenty of soap and water. Remove contaminated clothing and shoes. If skin irritation occurs: Get medical advice/attention.
First-aid measures after eye contact: If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Obtain medical attention if pain, blinking or redness persist.
First-aid measures after ingestion: Do NOT induce vomiting unless directed to do so by medical personnel. Call a POISON CENTER/doctor/physician if you feel unwell.

4.2. Most important symptoms and effects, both acute and delayed
Symptoms/injuries after inhalation: Inhalation may cause: irritation, coughing, shortness of breath.
Symptoms/injuries after skin contact: Effects of skin contact may include: skin irritation.
Symptoms/injuries after eye contact: May cause slight irritation.

4.3. Indication of any immediate medical attention and special treatment needed
No special procedures required.

SECTION 5: Firefighting measures

5.1. Extinguishing media
Suitable extinguishing media: Not combustible. If there is a fire close by, use suitable extinguishing agents.
Unsuitable extinguishing media: None known.

5.2. Special hazards arising from the substance or mixture
Fire hazard: The product itself does not burn.
Reactivity: Normally stable, even under fire exposure conditions, and not reactive with water. No dangerous reactions known.

5.3. Advice for firefighters
Protection during firefighting: Do not enter fire area without proper protective equipment, including respiratory protection. Wear a self contained breathing apparatus. Wear fire/flame resistant/retardant clothing.
SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel
Protective equipment : Avoid contact with skin and eyes.
Emergency procedures : Stop leak without risks if possible. Avoid all unnecessary exposure.

6.1.2. For emergency responders
Protective equipment : Equip cleanup crew with proper protection. Safety glasses, Gloves.
Emergency procedures : Stop leak if safe to do so. Ventilate area.

6.2. Environmental precautions
Contains no substances known to be hazardous to the environment. Prevent dispersion.

6.3. Methods and material for containment and cleaning up
For containment : Contain and collect as any solid.
Methods for cleaning up : Large spills: scoop solid spill into closing containers.

6.4. Reference to other sections
Section 7: safe handling.
Section 8: personal protective equipment.
Section 13: disposal information.

SECTION 7: Handling and storage

7.1. Precautions for safe handling
Precautions for safe handling : Avoid all eyes and skin contact and do not breathe vapour and mist.
Hygiene measures : Always wash your hands immediately after handling this product, and once again before leaving the workplace.

7.2. Conditions for safe storage, including any incompatibilities
Storage conditions : Store in a dry, cool and well-ventilated place. Store in original container.
Incompatible materials : None known.

7.3. Specific end use(s)
Catalyst.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters
No additional information available

8.2. Exposure controls
Appropriate engineering controls : Provide local exhaust or general room ventilation to minimize exposure to dust. No special work practices are needed beyond the above recommendations under anticipated conditions of normal use.
Hand protection : Wear suitable gloves resistant to chemical penetration.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties
Physical state : Solid
Appearance : Powder.
Molecular mass : 159.253 g/mol
Colour : White.
Odour : Odourless.
Odour threshold : Not applicable
pH : Not applicable
pH solution : 3 - 8 10% slurry in water
Relative evaporation rate (butylacetate=1) : Not applicable
Melting point : > 100 °C
Freezing point : > 100 °C
Boiling point : Not applicable
Flash point : Not applicable
Self ignition temperature : Not applicable
Decomposition temperature : 550 °C
Flammability (solid, gas) : Non flammable.
Zirconium Hydroxide: MELCat, Isolux, MELSorb, 302M
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according to GHS

Vapour pressure : No data available
Relative vapour density at 20 °C : No data available
Relative density : 0.8 - 1.2
Solubility : Water: < 1 mg/l
Log Pow : Not applicable
Log Kow : Not applicable
Viscosity, kinematic : Not applicable
Viscosity, dynamic : Not applicable
Explosive properties : Product is not explosive.
Oxidising properties : No oxidizing properties.
Explosive limits : Not applicable

9.2 Other information
VOC content : 0 %

SECTION 10: Stability and reactivity

10.1 Reactivity
Normally stable, even under fire exposure conditions, and not reactive with water. No dangerous reactions known.

10.2 Chemical stability
Stable under normal conditions.

10.3 Possibility of hazardous reactions
No additional information available

10.4 Conditions to avoid
Extremely high or low temperatures.

10.5 Incompatible materials
None known.

10.6 Hazardous decomposition products
On heating, decomposes to zirconium oxide.

SECTION 11: Toxicological information

11.1 Likely Routes of Exposure
Inhalation; dermal

11.2 Symptoms Related to Physical, Chemical and Toxicological Characteristic
Symptoms of exposure may include slight redness and irritation.

11.3 Effects from Exposure
No additional information.

11.4 Information on toxicological effects
Acute toxicity : Not classified (Conclusive but not sufficient for classification)

Zirconium Hydroxide (14475-63-9)

LD50 oral rat | > 2000 (≤ 5000) mg/kg Read-across from ZrO2: One key study was identified (Klimisch 1). Acute toxicity was determined via the acute class method (OECD Guideline 423 and EU Method B1 tris) in female Sprague-Dawley rats. The LD50 -value was > 5000 mg/kg. Three supporting studies were identified (Klimisch 2) which studied the acute oral toxicity via a standard acute test in Crj: CD (SD) IGS male and female rats. The LD50 -values determined in these studies were > 2000 mg/kg.

LD50 dermal rabbit | Read-across from ZrO2: According to the REACH Regulation, in addition to the oral route, for substances other than gases, the information mentioned under sections 8.5.2 to 8.5.3 shall be provided for at least one other route. The choice for the second route will depend on the nature of the substance and the likely route of human exposure. Based on the properties of the substance, the dermal route of exposure is not considered to be relevant (column 2 adaptation, Annex VIII, section 8.5).

LC50 inhalation rat (mg/l) | > 4.3 mg/l/4h Read-across from ZrO2: Ref: Andrew J. Smith (2010)

Skin corrosion/irritation : OECD Guideline 404; New Zealand White rabbit. Not irritating to skin (Conclusive but not sufficient for classification)
Serious eye damage/irritation : OECD 405. New Zealand white rabbit. Not irritating to eyes (Conclusive but not sufficient for classification)
Respiratory or skin sensitisation : OECD 406. No sensitizing reaction was observed for guinea pigs. (Lack of data)
Germ cell mutagenicity : Negative in vitro and in vivo tests. (Conclusive but not sufficient for classification)
Carcinogenicity : Not classified (Lack of data)
Zirconium Hydroxide: MELCat, Isolux, MELSorb, 302M
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according to GHS

Reproductive toxicity: Not classified (Lack of data)
Specific target organ toxicity (single exposure): Not classified (Conclusive but not sufficient for classification)
Specific target organ toxicity (repeated exposure): Not classified (Conclusive but not sufficient for classification)

<table>
<thead>
<tr>
<th>Zirconium Hydroxide (14475-63-9)</th>
<th>NOAEL (oral, rat, 90 days)</th>
<th>&gt; 3150 mg/kg bodyweight/day Read-across from ZrO2</th>
</tr>
</thead>
</table>

Aspiration hazard: Not classified (Lack of data)

11.5. Carcinogenicity Lists
Does not appear on IARC, NTP or OSHA carcinogen lists.

SECTION 12: Ecological information

12.1. Toxicity
Ecology - general: No ecotoxicological data about this product are known.

<table>
<thead>
<tr>
<th>Zirconium Hydroxide (14475-63-9)</th>
<th>LC50 fishes 1</th>
<th>&gt; 100 mg/l OECD Guideline 203. Read-across from ZrO2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>EC50 Daphnia 1</td>
<td>&gt; 100 mg/l EU Method C.2. Read-across from ZrO2</td>
</tr>
<tr>
<td></td>
<td>ErC50 (algae)</td>
<td>&gt; 100 mg/l OECD Guideline 201; Read-across from ZrO2</td>
</tr>
</tbody>
</table>

12.2. Persistence and degradability
Zirconium Hydroxide (14475-63-9)
Persistence and degradability: Not readily biodegradable.

12.3. Bioaccumulative potential
Zirconium Hydroxide (14475-63-9)
Bioaccumulative potential: Does not bioaccumulate beyond algae and shellfish.

12.4. Mobility in soil
Zirconium Hydroxide (14475-63-9)
Ecology - soil: Partitions to soil.

12.5. Results of PBT and vPvB assessment
Zirconium Hydroxide (14475-63-9)
PBT: not relevant – no registration required
vPvB: not relevant – no registration required
Results of PBT assessment: According to the Guidance on information requirements and chemical safety assessment, Chapter R.11: PBT assessment, “the PBT and vPvB criteria of Annex XIII to the regulation do not apply to inorganic substances”. Therefore the substance is not considered to require any further assessment of PBT properties.

12.6. Other adverse effects
No additional information available

SECTION 13: Disposal considerations

13.1. Waste treatment methods
Regional legislation (waste): Disposal must be done according to official regulations.
EURLW code: For disposal within the EC, the appropriate code according to the European Waste Catalogue (EWC) should be used.

SECTION 14: Transport information

In accordance with ADR / RID / ADNR / IMDG / ICAO / IATA

14.1. UN number
Not considered a dangerous good with regard to transport regulations

14.2. UN proper shipping name
Not applicable

14.3. Transport hazard class(es)
Overland transport: Not applicable
Transport by sea: Not applicable
Zirconium Hydroxide: MELCat, Isolux, MELSorb, 302M
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Air transport
Not applicable

SECTION 15: Regulatory information

15.1 US Federal regulations
Zirconium Hydroxide (14475-63-9)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

15.2 US State regulations
Zirconium Hydroxide (14475-63-9)
State or local regulations
Not included in State Right-to-Know Hazardous Chemicals Lists

15.3 International regulations
Zirconium Hydroxide (14475-63-9)
Not listed on Inventory of Chemicals and Chemical Substances (PICCS).
Listed on Inventory of Existing Chemical Substances (IECSC).
Not listed on New Zealand - Inventory of Chemicals (NZIoC).
Not listed on the AICS (the Australian Inventory of Chemical Substances).
Listed on the Canadian NDSL (Non-domestic Substances List) inventory.
Listed on the Japanese ENCS (Existing & New Chemicals Substances) inventory (1-734).

CANADA

Zirconium Hydroxide (14475-63-9)
Listed on the Canadian DSL (Domestic Substances List) inventory.
WHMIS Classification
Uncontrolled product according to WHMIS classification criteria

KOREA

Zirconium Hydroxide (KE-35656)
Disposal must be done according to official regulations.

EU-Regulations

Zirconium Hydroxide (14475-63-9)
Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances) substances.
No REACH Annex XVII restrictions
Contains no REACH candidate substance
VOC content : 0%
Contains no REACH Annex XIV substances. Annex XVII is not applicable for any constituents under the defined use.
Water hazard class (WGK): nwg - non-hazardous to water
WGK remark: Classification based on the components in compliance with Verwaltungsvorschrift wassergefährdender Stoffe (VwVwS)
Storage class (LGK): LGK 13 - Non-combustible solids

15.4 Chemical safety assessment
A chemical safety assessment has not been carried out

SECTION 16: Other information

Indication of changes: Original document

NFPA health hazard : 0 - Exposure under fire conditions would offer no hazard beyond that of ordinary combustible materials.
NFPA fire hazard : 0 - Materials that will not burn
NFPA reactivity : 0 - Normally stable, even under fire exposure conditions, and not reactive with water.
Zirconium Hydroxide: MELCat, Isolux, MELSorb, 302M
Safety Data Sheet
according to GHS

Data sources

:: Australia Worksafe “Preparation of Safety Data Sheets for Hazardous Chemicals”

:: Brazil ABNT NBR 14725


Chemical Inspection & Regulation Service; accessed at: http://www.cirs-reach.com/Inventory/Global_Chemical_Inventories.html

Chemical Safety Report: Zirconium dioxide; Magnesium Elektron Ltd; 2010-09-22

China GB T 16483:2008


Korean "Standard for Classification Labeling of Chemical Substance and Material Safety Data Sheet" Public Notice No. 2012-14


OSHA 29CFR 1910.1200


SANO, Hiroshi, Dept of Occupational Health and Toxicology, KITASATO University. "Implementation of GHS in Japan".


Abbreviations and acronyms

:: ATE: Acute Toxicity Estimate

:: CAS (Chemical Abstracts Service) number

:: CLP: Classification, Packaging and Labelling (of hazardous chemicals)

:: EC50: Environmental Concentration associated with a response by 50% of the test population.

:: GHS: Globally Harmonized System (of Classification and Labeling of Chemicals).

:: LD50: Lethal Dose for 50% of the test population.

:: OSHA: (US) Occupational Safety & Health Administration

:: PBT: Persistent, Bioaccumulative, Toxic.

:: REACH: Registration, Evaluation & Authorization of Chemicals

:: TSCA: Toxic Substances Control Act.

:: VOC: Volatile Organic Content


Training advice

:: Normal use of this product shall imply use in accordance with the instructions on the packaging.

Full text of R-, H- and EUH-phrases:

Not applicable

Redstone SDS ROW for MEL UK

SDS Prepared by: The Redstone Group, LLC
6397 Emerald Pkwy.
Suite 200
Dublin, OH 43016
T 614-923-7472
www.redstonegrp.com

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.