1 Commercial product name and supplier

Commercial product name: AxZir zirconia block

Designation/application/use: zirconium for dental use

Producer/Supplier: Shenyang Upcera Co., Ltd

TOX Emergency Number: 0086-24 88086882

2 Composition

chem. characterisation: presintered, prous ZrO₂ -Block

composition:

<table>
<thead>
<tr>
<th>Composition</th>
<th>CAS-Nr.</th>
<th>Symbol</th>
<th>R-infos</th>
<th>EG-Nr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zirkonium oxide (ZrO₂)</td>
<td>94%</td>
<td>134-23-4</td>
<td></td>
<td>215-222-7</td>
</tr>
<tr>
<td>&amp; hafnium oxide</td>
<td>7440-58-6</td>
<td></td>
<td></td>
<td>231-166-4</td>
</tr>
<tr>
<td>Aluminium oxide</td>
<td>&lt;0.5%</td>
<td>1344-28-1</td>
<td></td>
<td>215-691-6</td>
</tr>
<tr>
<td>Yttrium oxide</td>
<td>&lt;5.5%</td>
<td>1344-36-9</td>
<td></td>
<td>215-233-5</td>
</tr>
</tbody>
</table>

additional notes: the hazards in chapter 4-8 and 12 revere not to the product itself but on the dust released by processing.

3 Hazard Identification

Hazard denomination: not hazardous according to 99/45/ECC

Special hazard identification: None.

for men and environment: None.

4 First Aid measures:

general information: no special measures needed.

after swallowing: do not induce vomiting. rinse mouth thoroughly with water if person is conscious.

Eye contact: wash eyes with large quantities of clean water for at least 15 minutes. In case after-effects occur call a physician.

Skin contact: Wash thoroughly with warm water, if irritations occur or persist, consult physician.

Inhalation: Move person into fresh air, if irritations occur or persist, consult physician.

5 Fire fighting measures:

flammability: No, no special fire fighting measures required.

non suitable extinguishing agent: not known

further informations: none

6 Accidental release measures

Individual protection: use protective dust mask and object dust suction

Environmental protection: Avoid discharge into drains or surface water.

Cleansing: Clean up mechanically.

Additional indications: No hazardous substances are released.
7 Handling and storage

Handling: Only adequately trained personnel should handle this product. Keep out of reach of children.

Industrial hygiene: Usual hygienic measures are necessary. When using, do not eat or drink or smoke.

Storage: No special requirements for place of storage and containers. Not further indications necessary for storage, no restrictions for storage with other products.

Fire and explosion protection: Not required.

Indications for safe handling: Provide adequate local ventilation or suction unit, especially in case of dust exposure.

Further indications: Not required.

8 Exposure controls/personal protection

Exposition threshold / common dust threshold see TRGS 900

<table>
<thead>
<tr>
<th>Component</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>alveolar fraction</td>
<td>3 mg/cm³</td>
</tr>
<tr>
<td>inhaleable fraction</td>
<td>10 mg/cm³</td>
</tr>
<tr>
<td>zirkoniumdioxid (ZrO2)</td>
<td></td>
</tr>
<tr>
<td>CAS-Nr. 1314-23-4</td>
<td></td>
</tr>
<tr>
<td>EG-Nr. 215-222-7</td>
<td></td>
</tr>
<tr>
<td>TRGS 900</td>
<td></td>
</tr>
<tr>
<td>zirkoncompounds</td>
<td></td>
</tr>
<tr>
<td>inhaleable fraction</td>
<td>5 mg/cm³</td>
</tr>
<tr>
<td>peak threshold</td>
<td>4 mg/cm³</td>
</tr>
</tbody>
</table>

Technical measures: Provide adequate local ventilation or suction unit

Personal safety measures: use respirator if no adequate local suction is available.

If dust occurs: wear protective goggles with side protection and light protective clothing,

Clean skin after exposure and attend to skin with skin care.

Personal attitude: avoid contact with skin, mouth, eyes and clothing.

Wear protective goggles with side protection and light protective clothing,

Clean skin after exposure and attend to skin with skin care.

Do not eat, drink or smoke while working

Keep away from food or drinks

9. Toxicological information

There are no toxic reactions known at intended use.

Inhaling dust can cause irritations, dust contact with the skin can cause irritations

10. Physical and chemical properties

Odour: odourless

Melting point: app. 2680°C

Boiling point: app. 5500°C

Flashpoint: not flammable

Density: appr. 3 g/cm³

Solubility in water: insoluble in water

This product is not flammable or explosive
11. stability and reactivity

Avoidable terms: n.a.

Avoidable substances: n.a.

Hazardous corrosion products: n.a.

12. ecological hazards

No environmental hazard at intended use and properly disposal.

13. Disposal considerations

Take to an approved landfill or waste incineration plant, under conditions approved by the local authorities.

Take empty and contaminated containers to an approved landfill or waste incineration plant, under conditions approved by the local authorities.

14. transport information

Product does not classify as hazardous materials.

15. regulatory information

The usual precaution for the use of chemical substances should be taken.

Identification according to EC rules:

- According to EC rules the product is not subject to declaration.

National regulations:

- Water hazard class: n.a.
- Not subject to declaration according to ordinance on hazardous substances

The above mentioned data correspond to our present state of knowledge and experience. The safety data sheet serves as description of the products in regard to necessary safety measures. The indications do not have the meaning of guarantees on properties.

**Physical and Chemical Properties**

<table>
<thead>
<tr>
<th></th>
<th>Upcera Zir-Blank</th>
<th>Requirements for ISO 13356:1997</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bending strength</td>
<td>1200MPa</td>
<td>≥500MPa</td>
</tr>
<tr>
<td>Sintering density</td>
<td>6.06g/cm³</td>
<td>≥6.0 g/cm³</td>
</tr>
<tr>
<td>Vicker's hardness</td>
<td>12.8GPa</td>
<td>N/A</td>
</tr>
<tr>
<td>Average grain size</td>
<td>0.5µm</td>
<td>≤0.6µm</td>
</tr>
<tr>
<td>Chemical solubility</td>
<td>10µg/cm²</td>
<td>100µg/cm² (ISO 6872)</td>
</tr>
<tr>
<td>Radioactivity</td>
<td>0.1Bq/g</td>
<td>≤0.8 Bq/g (ISO 6872)</td>
</tr>
</tbody>
</table>

**Test Report**

<table>
<thead>
<tr>
<th></th>
<th>Tests performed</th>
<th>Standard requirements</th>
<th>Test results</th>
<th>Complied with standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biological properties</td>
<td>Cytotoxicity test</td>
<td>Cytotoxicity should be grade 0</td>
<td>The grade of the cytotoxicity is 0, the tested sample has no cytotoxicity</td>
<td>Complied</td>
</tr>
</tbody>
</table>

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The information provided is based on the Safety Data Sheet According to 91/155 EEC. It includes physical and chemical properties, disposal considerations, and regulatory information. The data is intended to provide a description of the product's characteristics and safety measures necessary for its use.
<table>
<thead>
<tr>
<th>Biological properties</th>
<th>Short term systemic toxicity test – oral route</th>
<th>Sensitization test (Delayed-type hypersensitivity test)</th>
<th>Intracutaneous reactivity test</th>
<th>Complied</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The sample should be no toxicity</td>
<td>The sample should have no sensitization</td>
<td>No intracutaneous reactivity</td>
<td>Complied</td>
</tr>
<tr>
<td></td>
<td>During the experimental period, no significant differences were found between the test group and the control group. This indicated that the tested sample has no systemic toxicity</td>
<td>The scales of reactions of 10 animals were &quot;0&quot;, less than &quot;1&quot;. This indicated that the tested sample has no sensitization</td>
<td>The primary irritation index of the tested product by sodium chloride extraction is &quot;0&quot;, by cotton seed oil extraction is 0.17, no irritation</td>
<td>Complied</td>
</tr>
</tbody>
</table>