1. PRODUCT AND COMPANY IDENTIFICATION

Product name: CTA 3
Application: Absorber material for gas treatment
Company: Centrotherm Clean Solutions GmbH & Co. KG
          Johannes-Schmid-Str. 3
          89143 Blaubeuren, Germany
Phone: +49 7344 918 0
Fax: +49 7344 918 1388
Emergency phone number: +49 7344 918 1600

2. COMPOSITION / INFORMATION ON INGREDIENTS

Chemical characterization:

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>EINECS-No.</th>
<th>CAS-No.</th>
<th>Weight-%</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copper oxide</td>
<td>215-269-1</td>
<td>1317-38-0</td>
<td>50 ± 10</td>
<td>Xn, R22</td>
</tr>
<tr>
<td>Manganese oxide</td>
<td>215-202-6</td>
<td>1313-13-9</td>
<td>30 ± 10</td>
<td>Xn, R20/22; S25</td>
</tr>
<tr>
<td>Other metal oxides</td>
<td></td>
<td></td>
<td>&lt; 10</td>
<td></td>
</tr>
<tr>
<td>Aluminium oxide</td>
<td>215-691-6</td>
<td>1344-28-1</td>
<td>10 ± 5</td>
<td></td>
</tr>
<tr>
<td>Humidity</td>
<td>n.a.</td>
<td>n.a.</td>
<td>&lt; 5</td>
<td></td>
</tr>
</tbody>
</table>

3. HAZARDS IDENTIFICATION

R20/22 Harmful by inhalation or if swallowed
Causes irritation to skin, eyes and respiratory tract

4. FIRST AID MEASURES

General Remarks: If you feel unwell, seek medical advice
Eye contact: Flush eye with copious amounts of water for at least 15 minutes; get medical attention
Skin contact: Flush affected area with soap and copious amounts of water
Inhalation: Remove person to fresh air; get medical attention
Ingestion: Rinse mouth with plenty of water; get medical attention

5. FIRE FIGHTING MEASURES

Extinguishing media: The material itself is noncombustible; use extinguishing media appropriate for surrounding materials
Special firefighting procedures: None
Unusual fire hazards: The material is an oxidizer under certain conditions and may accelerate the burning of combustible material

6. ACCIDENTAL RELEASE MEASURES

General remark Avoid generation of dust
Environmental precautions: Avoid release into drains and the environment
Cleaning procedure: Pick up (e.g. with a scoop) and place in a suitable container for reclamation or disposal

7. HANDLING AND STORAGE

Handling: Avoid generation of dust; observe personal protective measures and exposure limits
Storage: Store in a cool, dry area in closed container
Segregate from easily oxidizable materials
8. EXPOSURE CONTROLES / PERSONAL PROTECTION

Ingredients for which exposure limits at the work place are specified:

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>TLV-TWA</th>
<th>Source</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total dust</td>
<td>10 mg/m³</td>
<td>ACGIH</td>
<td>General exposure limit for dust</td>
</tr>
<tr>
<td>Respirable dust</td>
<td>5 mg/m³</td>
<td>ACGIH</td>
<td>General exposure limit for dust</td>
</tr>
<tr>
<td>Copper oxid</td>
<td>1 mg/m³</td>
<td>ACGIH</td>
<td>Copper and its compounds as dust</td>
</tr>
<tr>
<td>Manganese oxide</td>
<td>1 mg/m³</td>
<td>ACGIH</td>
<td>Manganese and its compounds as dust</td>
</tr>
</tbody>
</table>

Personal protection:
- General remarks: General safety measures for handling of chemicals should be followed
- Hygienic measures: Do not eat, drink or smoke, while working with this material; wash your hands thoroughly after finishing work
- Respiratory protection: In case where high dust exposure may exist, the use of a NIOSH approved dust respirator or an air-supplied respirator is advised. Engineering or administrative controls should be implemented to control dust.
- Hand protection: Rubber gloves
- Eye protection: Safety glasses
- Protective clothing: Normal work clothing sufficient

9. PHYSICAL AND CHEMICAL PROPERTIES

Appereance:
- Form: Extrudate, 4 mm
- Color: Black/dark gray
- Odor: none

Additional information:
- Melting point: > 1200 °C
- Boiling point: n.a.
Flash point: n.a.
Ignition temperature: n.a.
Lower explosion limit: n.a.
Upper explosion limit: n.a.
Bulk density: 0.9 - 1.0 kg/l
Solubility in water: Insoluble
pH-Value: 6 - 8

10. STABILITY AND REACTIVITY

Stability: Stable under ordinary conditions of use and storage
Hazardous decomposition products: None
Conditions to avoid: Contact with incompatible materials or heat (> 450°C)
Incompatible materials: Avoid contact with acids; May ignite organic materials, especially organic solvents; may form unstable acetylides in contact with acetylene

11. TOXICOLOGICAL INFORMATION

Inhalation: Breathing dust may irritate the nose, throat and mucous membrane of the respiratory tract and cause coughing and chest discomfort. Prolonged inhalation of excessive dust may produce pulmonary disorders.
Ingestion: Reports of adverse effects in humans from ingestion of manganese and copper compounds are rare
Skin: Contact with dust may irritate the skin
Eyes: Contact with dust may irritate the eyes
LD 50 / LC 50 Values: No information found relating to normal routes of occupational exposure
12. ECOLOGICAL INFORMATION

Environmental fate: When released into the soil or water this material is not expected to biodegrade

Environmental toxicity: Low hazardous to water

13. DISPOSAL CONSIDERATIONS

Product: Unused product should be managed in an appropriate and approved waste disposal facility in accordance with federal, state and local requirements. Recovery or recycling should be favored over disposal. Spent (contaminated) material may have different hazardous properties than the original material. Ask the supplier for information on appropriate disposal/recycling of spent material.

Container: Can be reused after emptying and cleaning

14. TRANSPORT INFORMATION

By truck: Not regulated
By see: Not regulated
By plane: Not regulated
General remarks: Spent (contaminated) material may have different hazardous properties than the original material. After usage the material might be contaminated with phosphorus, arsenic (e.g.) and then classifies as dangerous good for transportation. Contact the supplier in individual cases

15. REGULATORY INFORMATION

General remarks: Compounds of this product are classified and labeled according to EU directives;
Compounds of this product are listed on the TSCA Inventory

**Hazardous ingredients:** Copper oxide, manganese oxide

**Symbol:** Xn Harmful

**R-Phrases:**
- R20/22 Harmful by inhalation or if swallowed

**S-Phrases:**
- S2 Keep out of reach of children
- S22 Do not breathe dust
- S24/25 Avoid contact with skin and eyes

16. OTHER INFORMATION

Used product may have different hazardous properties than the original material. For that reason this MSDS does not apply for spent (contaminated) material.

The information contained herein is accurate to the best of our knowledge. The MSDS is intended to describe the product for the purpose of health, safety and environmental requirements only. It should therefore not be construed as guarantee of any specific property of the product. The information in the MSDS is intended only as a guide to the appropriate precautionary handling of the material and does not in any way excuse the user from knowing and applying all the regulations governing his activity. It is the sole responsibility of the user to take all precautions required in handling the product.