1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

Product identifier: BENTONITE

Version No.: 17

Issue date: 01-February-2012

Revision date: 04-August-2014

Supersedes date: 03-October-2013

CAS #: 1302-78-9

Synonym(s): SMECTITE CLAY * BENTONITE

Manufacturer information:

CETCO
2870 Forbs Avenue
Hoffman Estates, IL 60192 United States

safetydata@amcol.com

http://www.cetco.com/

General Information: 800 527-9948

Americas: 1.866.519.4752 (US, Canada, Mexico) 1 760 476 3962

2. Hazards Identification

Potential health effects:

Eyes: Dust or powder may irritate eye tissue. Mild irritant to eyes (according to the modified Kay & Calandra criteria).

Inhalation: Inhalation of dusts may cause respiratory irritation.

Ingestion: No significant adverse effects are expected upon ingestion of the product.

Signs and Symptoms:

None known.

3. Composition/Information on Ingredients

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS #</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>BENTONITE</td>
<td>1302-78-9</td>
<td>100</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Constituents</th>
<th>CAS #</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>SMECTITE GROUP MINERALS</td>
<td>1318-93-0</td>
<td></td>
</tr>
<tr>
<td>Calcium carbonate</td>
<td>471-34-1</td>
<td></td>
</tr>
<tr>
<td>Quartz</td>
<td>14808-60-7</td>
<td>&lt;= 8</td>
</tr>
<tr>
<td>Cristobalite</td>
<td>14464-46-1</td>
<td>&lt;= 2</td>
</tr>
</tbody>
</table>

Composition comments: The purity of the product is 100% w/w. Impurities are not applicable for a UVCB substance.

4. FIRST-AID MEASURES

First aid procedures:

Eye contact: No specific first aid measures noted. Flush thoroughly with water. If irritation occurs, get medical assistance.

Skin contact: No specific first aid measures noted. Wash skin with soap and water. Get medical attention if irritation develops and persists.

Inhalation: No specific first aid measures noted. Move to fresh air. Call a physician if symptoms develop or persist.

Ingestion: No specific first aid measures noted. Rinse mouth thoroughly. Get medical attention if any discomfort occurs.

Notes to physician: Provide general supportive measures and treat symptomatically.

General advice: No hazards which require special first aid measures. Provide general supportive measures and treat symptomatically.
5. Fire-fighting measures

**Flammable properties**
The product is not flammable.

**Extinguishing media**

- **Suitable extinguishing media**
  Use any media suitable for the surrounding fires.

- **Unsuitable extinguishing media**
  Not applicable, non-combustible.

**Protection of firefighters**

- **Specific hazards arising from the chemical**
  None known. The product itself does not burn.

- **Protective equipment for firefighters**
  None known.

**Fire fighting equipment/instructions**
Material can be slippery when wet.

**Explosion data**

- **Sensitivity to static discharge**
  Not available.

- **Sensitivity to mechanical impact**
  Not available.

**General fire hazards**
This material will not burn.

6. ACCIDENTAL RELEASE MEASURES

**Personal precautions**
No special precautions are necessary beyond normal good hygiene practices. See Section 8 for additional personal protection advice when handling this product.

**Environmental precautions**
No special environmental precautions required. Prevent further leakage or spillage if safe to do so.

7. HANDLING AND STORAGE

**Handling**
Keep formation of airborne dusts to a minimum. Provide appropriate exhaust ventilation at places where dust is formed. In case of insufficient ventilation, wear suitable respiratory equipment.

**Storage**
Store in a dry area. Keep the container dry. No special restrictions on storage with other products.

8. Exposure Controls / Personal Protection

**Occupational exposure limits**

**US. ACGIH Threshold Limit Values**

<table>
<thead>
<tr>
<th>Constituents</th>
<th>Type</th>
<th>Value</th>
<th>Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>INERT OR NUISANCE DUSTS (CAS SEQ250)</td>
<td>TWA</td>
<td>3 mg/m3</td>
<td>Respirable particles.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10 mg/m3</td>
<td>Inhalable particles.</td>
</tr>
</tbody>
</table>

**Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2)**

<table>
<thead>
<tr>
<th>Constituents</th>
<th>Type</th>
<th>Value</th>
<th>Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>INERT OR NUISANCE DUSTS (CAS SEQ250)</td>
<td>TWA</td>
<td>3 mg/m3</td>
<td>Respirable particles.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10 mg/m3</td>
<td>Total particulate.</td>
</tr>
</tbody>
</table>

**Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended)**

<table>
<thead>
<tr>
<th>Constituents</th>
<th>Type</th>
<th>Value</th>
<th>Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>INERT OR NUISANCE DUSTS (CAS SEQ250)</td>
<td>TWA</td>
<td>3 mg/m3</td>
<td>Respirable fraction.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10 mg/m3</td>
<td>Total dust.</td>
</tr>
<tr>
<td>Constituents</td>
<td>Type</td>
<td>Value</td>
<td>Form</td>
</tr>
<tr>
<td>--------------</td>
<td>-------</td>
<td>----------</td>
<td>-----------------</td>
</tr>
<tr>
<td></td>
<td>TWA</td>
<td>3 mg/m³</td>
<td>Respirable particles.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10 mg/m³</td>
<td>Inhalable particles.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>TWA</td>
<td>3 mg/m³</td>
<td>Respirable particles.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10 mg/m³</td>
<td>Inhalable</td>
</tr>
<tr>
<td></td>
<td>TWA</td>
<td>10 mg/m³</td>
<td>Total dust.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PEL</td>
<td>5 mg/m³</td>
<td>Respirable fraction.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>15 mg/m³</td>
<td>Total dust.</td>
</tr>
<tr>
<td></td>
<td>TWA</td>
<td>5 mg/m³</td>
<td>Respirable fraction.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>15 mg/m³</td>
<td>Total dust.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>50 millions of particles</td>
<td>Total dust.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>15 millions of particle</td>
<td>Respirable fraction.</td>
</tr>
</tbody>
</table>

**Biological limit values**
No biological exposure limits noted for the ingredient(s).

**Engineering controls**
Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits. If these are not sufficient to maintain concentrations of particulates and solvent vapour below the OEL, suitable respiratory protection must be worn.

**Personal protective equipment**

- **Eye / face protection**
  Wear dust-resistant safety goggles where there is danger of eye contact.

- **Skin protection**
  No special protective equipment required. Normal work clothing (long sleeved shirts and long pants) is recommended.

- **Respiratory protection**
  Use a particulate filter respirator for particulate concentrations exceeding the Occupational Exposure Limit.

**9. Physical & Chemical Properties**

- **Appearance**
  Lump, granular or fine powder.

- **Physical state**
  Solid.

- **Form**
  Various.

- **Colour**
  Various.

- **Odour**
  None.

- **Odour threshold**
  Not applicable.

- **pH**
  8.5 - 11

- **Vapour pressure**
  0 kPa at 25 °C
  Not applicable.

- **Vapour density**
  Not applicable.

- **Boiling point**
  Not applicable.
Melting point/freezing point: > 450 °C (> 842 °F) / Not applicable.
Solubility (water): < 0.9 mg/l
Specific gravity: Not applicable.
Relative density: 2.6 g/cm³
Flash point: Not applicable.
Flammability limits in air, upper, % by volume: Not applicable.
Flammability limit - upper (%): Not applicable.
Flammability limits in air, lower, % by volume: Not applicable.
Flammability limit - lower (%): Not applicable.
Auto-ignition temperature: Not applicable.
VOC: 0 %
Evaporation rate: Not applicable.
Viscosity: Not applicable.
Viscosity temperature: Not applicable.
Percent volatile: 0 %
Partition coefficient: Not applicable.
(n-octanol/water): Not applicable.
Flammability (Train fire): Not applicable.
Bulk density: 0.9 - 1.4 g/cm³
Molecular weight: Not applicable.
Molecular formula: UVCB Substance

Decomposition temperature: > 500 °C (> 932 °F)
Explosive limit: Not applicable.
Explosive limit - lower (%): Not applicable.
Explosive limit - lower (%): Not applicable.
Explosive limit – upper (%): Not applicable.
Explosive limit - upper (%): Not applicable.
Explosive properties: Not explosive
Explosivity: Not applicable.
Fire point: Not applicable.
Flame extension: Not applicable.
Flame projection: Not applicable.
Flammability: Not applicable.
Flammability (flash back): Not applicable.
Flammability (Heat of combustion): Not applicable.
Flammability (solid, gas): This product is not flammable.
Flash point class: Not flammable
Oxidizing properties: None.
pH in aqueous solution: 8.5 - 11
10. Chemical Stability & Reactivity Information

Chemical stability
Stable at normal conditions.

Conditions to avoid
Moisture.

Incompatible materials
None known.

Hazardous decomposition products
Irritating and/or toxic fumes and gases may be emitted upon the products decomposition.

Possibility of hazardous reactions
Will not occur.

11. TOXICOLOGICAL INFORMATION

Toxicological data

<table>
<thead>
<tr>
<th>Product</th>
<th>Species</th>
<th>Test results</th>
</tr>
</thead>
<tbody>
<tr>
<td>BENTONITE (CAS 1302-78-9)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Acute**

**Inhalation**

<table>
<thead>
<tr>
<th></th>
<th>Specimen</th>
<th>Test results</th>
</tr>
</thead>
<tbody>
<tr>
<td>LC50</td>
<td>Rat</td>
<td>&gt; 5.27 mg/l, 4 hrOECD 436</td>
</tr>
</tbody>
</table>

**Oral**

<table>
<thead>
<tr>
<th></th>
<th>Specimen</th>
<th>Test results</th>
</tr>
</thead>
<tbody>
<tr>
<td>LD50</td>
<td>Rat</td>
<td>&gt; 2000 mg/kgOECD 425</td>
</tr>
</tbody>
</table>

**Acute effects**
Not classified.

**Carcinogenicity**
No carcinogenicity data available for this product. Sepiolite was evaluated by IARC as class 3 ("Cannot be classified as to carcinogenicity to humans"). Based on read-across with sepiolite, bentonite was assessed as non-carcinogenic. Therefore classification of bentonite for carcinogenicity is not warranted.

**Mutagenicity**
Not classified.

**Reproductive effects**
Not classified.

**Symptoms and target organs**
None known.

12. ECOLOGICAL INFORMATION

Ecotoxicological data

<table>
<thead>
<tr>
<th>Product</th>
<th>Species</th>
<th>Test results</th>
</tr>
</thead>
<tbody>
<tr>
<td>BENTONITE (CAS 1302-78-9)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Aquatic**

<table>
<thead>
<tr>
<th></th>
<th>Specimen</th>
<th>Test results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crustacea</td>
<td>Daphnia</td>
<td>&gt; 100 mg/l, 48 hours</td>
</tr>
<tr>
<td>EC50</td>
<td>Freshwater algae</td>
<td>&gt; 100 mg/l, 72 hours</td>
</tr>
<tr>
<td>Other</td>
<td>Freshwater fish</td>
<td>16000 mg/l, 96 hours</td>
</tr>
<tr>
<td>LC50</td>
<td>Marine water fish</td>
<td>2800 - 3200 mg/l, 24 hours</td>
</tr>
<tr>
<td></td>
<td>Coon stripe shrimp (Pandalus danae)</td>
<td>24.8 mg/l, 96 hours</td>
</tr>
<tr>
<td></td>
<td>Dungeness or edible crab (Cancer magister)</td>
<td>81.6 mg/l, 96 hours</td>
</tr>
<tr>
<td>Fish</td>
<td>Rainbow trout, donaldson trout</td>
<td>19000 mg/l, 96 hours</td>
</tr>
<tr>
<td>LC50</td>
<td>(Oncorhynchus mykiss)</td>
<td></td>
</tr>
</tbody>
</table>

**Persistence and degradability**
Not relevant for inorganic substances

**Bioaccumulation / Accumulation**
Will not bio-accumulate.

**Partition coefficient**
Not applicable.

**Mobility in environmental media**
Low water solubility, expected to sink and migrate into the sediment. Expected to partition to sediment and wastewater solids.

13. DISPOSAL CONSIDERATIONS

Disposal instructions
Dispose in accordance with all applicable regulations.

Waste from residues / unused products
Dispose of in accordance with local regulations.

Contaminated packaging
Store containers and offer for recycling of material when in accordance with the local regulations.
14. Transport information

TDG
Not regulated as dangerous goods.

IATA
Not regulated as dangerous goods.

IMDG
Not regulated as dangerous goods.

15. REGULATORY INFORMATION

WHMIS status
Controlled

WHMIS Classification
D2A - Other Toxic Effects-VERY TOXIC

WHMIS labeling

Inventory status

<table>
<thead>
<tr>
<th>Country(s) or region</th>
<th>Inventory name</th>
<th>On inventory (yes/no)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>Australian Inventory of Chemical Substances (AICS)</td>
<td>Yes</td>
</tr>
<tr>
<td>Canada</td>
<td>Domestic Substances List (DSL)</td>
<td>Yes</td>
</tr>
<tr>
<td>Canada</td>
<td>Non-Domestic Substances List (NDSL)</td>
<td>No</td>
</tr>
<tr>
<td>China</td>
<td>Inventory of Existing Chemical Substances in China (IECSC)</td>
<td>Yes</td>
</tr>
<tr>
<td>Europe</td>
<td>European Inventory of Existing Commercial Chemical Substances (EINECS)</td>
<td>Yes</td>
</tr>
<tr>
<td>Europe</td>
<td>European List of Notified Chemical Substances (ELINCS)</td>
<td>No</td>
</tr>
<tr>
<td>Japan</td>
<td>Inventory of Existing and New Chemical Substances (ENCS)</td>
<td>No</td>
</tr>
<tr>
<td>Korea</td>
<td>Existing Chemicals List (ECL)</td>
<td>Yes</td>
</tr>
<tr>
<td>New Zealand</td>
<td>New Zealand Inventory</td>
<td>Yes</td>
</tr>
<tr>
<td>Philippines</td>
<td>Philippine Inventory of Chemicals and Chemical Substances (PICCS)</td>
<td>Yes</td>
</tr>
<tr>
<td>United States &amp; Puerto Rico</td>
<td>Toxic Substances Control Act (TSCA) Inventory</td>
<td>Yes</td>
</tr>
</tbody>
</table>

* A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s).

A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

16. OTHER INFORMATION

Recommended restrictions
None known.

Further information
This safety datasheet only contains information relating to safety and does not replace any product information or product specification.

HMIS® ratings
Health: 1
Flammability: 0
Physical Hazard: 0

NFPA ratings
Health: 0
Flammability: 0
Instability: 0

Disclaimer
The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The manufacturer expressly does not make any representations, warranties, or guarantees as to its accuracy, reliability or completeness nor assumes any liability, for its use. It is the user's responsibility to verify the suitability and completeness of such information for each particular use. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

Prepared by
EHS Department