# Material Safety Data Sheet

## 1. Product and company identification

<table>
<thead>
<tr>
<th>Product name</th>
<th>Molecular Sieve</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material uses</td>
<td>Analytical chemistry.</td>
</tr>
<tr>
<td>Supplier/Manufacturer</td>
<td>Agilent Technologies, Inc.</td>
</tr>
<tr>
<td>Logistics Center - Americas</td>
<td>500 Ships Landing Way</td>
</tr>
<tr>
<td>New Castle, Delaware 19720</td>
<td>800-227-9770</td>
</tr>
<tr>
<td>Part No.</td>
<td>F4156301</td>
</tr>
<tr>
<td>Validation date</td>
<td>01/16/2013</td>
</tr>
<tr>
<td>In case of emergency</td>
<td>Chemtrec: 1-800-424-9300</td>
</tr>
</tbody>
</table>

## 2. Hazards identification

<table>
<thead>
<tr>
<th>Physical state</th>
<th>Solid. [Pellets.]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Odor</td>
<td>None</td>
</tr>
<tr>
<td>OSHA/HCS status</td>
<td>This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).</td>
</tr>
</tbody>
</table>

### Emergency overview

- **Signal word**: DANGER!
- **Hazard statements**: CAUSES RESPIRATORY TRACT, DIGESTIVE TRACT, EYE AND SKIN BURNS. CONTAINS MATERIAL THAT MAY CAUSE TARGET ORGAN DAMAGE, BASED ON ANIMAL DATA. SUSPECT CANCER HAZARD - CONTAINS MATERIAL WHICH MAY CAUSE CANCER.

### Precautions

- Avoid exposure - obtain special instructions before use. Do not breathe dust. Do not ingest. Do not get in eyes or on skin or clothing. Use only with adequate ventilation. Keep container tightly closed and sealed until ready for use. Wash thoroughly after handling.

### Potential acute health effects

- **Inhalation**: Corrosive to the respiratory system.
- **Ingestion**: Corrosive to the digestive tract. Causes burns.
- **Skin**: Corrosive to the skin. Causes burns.
- **Eyes**: Corrosive to eyes. Causes burns.

### Potential chronic health effects

- **Chronic effects**: Contains material that may cause target organ damage, based on animal data.
- **Carcinogenicity**: Contains material which may cause cancer. Risk of cancer depends on duration and level of exposure.

- **Mutagenicity**: No known significant effects or critical hazards.
- **Teratogenicity**: No known significant effects or critical hazards.
- **Developmental effects**: No known significant effects or critical hazards.
- **Fertility effects**: No known significant effects or critical hazards.
- **Target organs**: Contains material which may cause damage to the following organs: blood, kidneys, lungs, the nervous system, mucous membranes, upper respiratory tract, skin, eye, lens or cornea, testes.

### Over-exposure signs/symptoms

- **Inhalation**: Adverse symptoms may include the following: respiratory tract irritation, coughing

- **Ingestion**: Adverse symptoms may include the following: stomach pains

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2.  Hazards identification

Skin : Adverse symptoms may include the following:
- pain or irritation
- redness
- blistering may occur

Eyes : Adverse symptoms may include the following:
- pain
- watering
- redness

Medical conditions aggravated by over-exposure : Pre-existing disorders involving any target organs mentioned in this MSDS as being at risk may be aggravated by over-exposure to this product.

See toxicological information (Section 11)

3.  Composition/information on ingredients

<table>
<thead>
<tr>
<th>Name</th>
<th>CAS number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silicon dioxide</td>
<td>7631-86-9</td>
<td>60 - 100</td>
</tr>
<tr>
<td>Aluminium oxide</td>
<td>1344-28-1</td>
<td>30 - 60</td>
</tr>
<tr>
<td>Disodium oxide</td>
<td>1313-59-3</td>
<td>10 - 30</td>
</tr>
<tr>
<td>Magnesium oxide</td>
<td>1309-48-4</td>
<td>1 - 5</td>
</tr>
<tr>
<td>Quartz (SiO2)</td>
<td>14808-60-7</td>
<td>1 - 5</td>
</tr>
</tbody>
</table>

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

4.  First aid measures

Eye contact : Check for and remove any contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical attention immediately.

Skin contact : In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention immediately.

Inhalation : Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Ingestion : Wash out mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

Notes to physician : No specific treatment. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

5.  Fire-fighting measures

Flammability of the product : No specific fire or explosion hazard.

Extinguishing media

Suitable : Use an extinguishing agent suitable for the surrounding fire.

Not suitable : None known.

Special exposure hazards : No action shall be taken involving any personal risk or without suitable training.

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5. Fire-fighting measures

Hazardous thermal decomposition products: Decomposition products may include the following materials: metal oxide/oxides

Special protective equipment for fire-fighters: Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

6. Accidental release measures

Personal precautions: No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see Section 8).

Environmental precautions: Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods for cleaning up: Move containers from spill area. Vacuum or sweep up material and place in a designated, labeled waste container. Dispose of via a licensed waste disposal contractor.

7. Handling and storage

Handling: Put on appropriate personal protective equipment (see Section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. Avoid exposure - obtain special instructions before use. Do not get in eyes or on skin or clothing. Do not ingest. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

Storage: Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

8. Exposure controls/personal protection

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Exposure limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silicon dioxide</td>
<td>NIOSH REL (United States, 6/2009). TWA: 6 mg/m³ 10 hours. OSHA PEL 1989 (United States, 3/1989). TWA: 10 mg/m³ 8 hours. Form: Dust TWA: 5 mg/m³ 8 hours. Form: Respirable fraction ACGIH TLV (United States). TWA: 1 mg/m³ Form: Respirable OSHA PEL (United States, 6/2010). TWA: 5 mg/m³ 8 hours. Form: Respirable fraction TWA: 15 mg/m³ 8 hours. Form: Total dust ACGIH TLV (United States, 3/2012). TWA: 1 mg/m³ 8 hours. Form: Respirable fraction NIOSH REL (United States, 6/2009). Notes: as Al TWA: 5 mg/m³, (as Al) 10 hours. Form: PYRO POWDERS AND WELDING FUMES</td>
</tr>
<tr>
<td>Aluminium oxide</td>
<td></td>
</tr>
<tr>
<td>Magnesium oxide</td>
<td>ACGIH TLV (United States, 3/2012). TWA: 10 mg/m³ 8 hours. Form: Inhalable fraction OSHA PEL (United States, 6/2010). TWA: 15 mg/m³ 8 hours. Form: Total particulates OSHA PEL 1989 (United States, 3/1989). TWA: 10 mg/m³ 8 hours. Form: Total particulates</td>
</tr>
<tr>
<td>Quartz (SiO2)</td>
<td>OSHA PEL Z3 (United States, 9/2005). Notes: 250/(%SiO2+5) TWA: 250 mppcf 8 hours. Form: Respirable</td>
</tr>
</tbody>
</table>

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Recommended monitoring procedures: If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to appropriate monitoring standards. Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

Engineering measures: Use only with adequate ventilation. If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Hygiene measures: Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal protection

Respiratory: Use a properly fitted, particulate filter respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Hands: Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

Eyes: Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles and/or face shield. If inhalation hazards exist, a full-face respirator may be required instead.

Skin: Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Environmental exposure controls: Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Other protection: Not available.
9. Physical and chemical properties

- **Physical state**: Solid. [Pellets.]
- **Flash point**: Closed cup: Not applicable.
- **Auto-ignition temperature**: Not applicable.
- **Flammable limits**: Not available.
- **Color**: Tan.
- **Odor**: None
- **pH**: Not available.
- **Boiling/condensation point**: Not available.
- **Melting/freezing point**: Not available.
- **Density**: Not applicable.
- **Vapor pressure**: Not available.
- **Vapor density**: Not available.
- **Odor threshold**: Not available.
- **Evaporation rate**: Not available.
- **Viscosity**: Dynamic (room temperature): Not applicable.

10. Stability and reactivity

- **Chemical stability**: The product is stable.
- **Conditions to avoid**: No specific data.
- **Materials to avoid**: Reactive or incompatible with the following materials: oxidizing materials, acids, alkalis and moisture.
  Hydrogen chloride (HCl).
- **Hazardous decomposition products**: Under normal conditions of storage and use, hazardous decomposition products should not be produced.
- **Possibility of hazardous reactions**: Under normal conditions of storage and use, hazardous reactions will not occur.

11. Toxicological information

- **Acute toxicity**: Not available.
- **Chronic toxicity**: Not available.

  - **Conclusion/Summary**: Not available.

- **Irritation/Corrosion**

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Score</th>
<th>Exposure</th>
<th>Observation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silicon dioxide</td>
<td>Eyes - Mild irritant</td>
<td>Rabbit</td>
<td>-</td>
<td>24 hours 25 milligrams</td>
<td>-</td>
</tr>
</tbody>
</table>

- **Sensitizer**

  - **Conclusion/Summary**: Not available.

- **Carcinogenicity**

- **Classification**

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>ACGIH</th>
<th>IARC</th>
<th>EPA</th>
<th>NIOSH</th>
<th>NTP</th>
<th>OSHA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silicon dioxide</td>
<td>-</td>
<td>3</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Aluminium oxide</td>
<td>A4</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Magnesium oxide</td>
<td>A4</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Quartz (SiO2)</td>
<td>A2</td>
<td>1</td>
<td>-</td>
<td>+</td>
<td>Proven.</td>
<td>-</td>
</tr>
</tbody>
</table>

- **Mutagenicity**

  - **Conclusion/Summary**: Not available.

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11. Toxicological information

**Teratogenicity**

**Conclusion/Summary** : Not available.

**Reproductive toxicity**

**Conclusion/Summary** : Not available.

12. Ecological information

**Ecotoxicity** : No known significant effects or critical hazards.

**Aquatic ecotoxicity**

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminium oxide</td>
<td>Acute NOEC &gt;100 mg/l</td>
<td>Algae</td>
<td>72 hours</td>
</tr>
<tr>
<td></td>
<td>Acute NOEC &gt;100 mg/l</td>
<td>Daphnia</td>
<td>48 hours</td>
</tr>
</tbody>
</table>

**Other adverse effects** : No known significant effects or critical hazards.

13. Disposal considerations

**Waste disposal** : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Disposal should be in accordance with applicable regional, national and local laws and regulations. Local regulations may be more stringent than regional or national requirements.

The information presented below only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

14. Transport information

**Regulatory information**

**DOT / IMDG / IATA /** : Not regulated.

15. Regulatory information

**HCS Classification**

- Corrosive material
- Carcinogen
- Target organ effects

**U.S. Federal regulations**

- **TSCA 8(a) IUR Exempt/Partial exemption**: Not determined
- **United States inventory (TSCA 8b)**: All components are listed or exempted.
- **SARA 302/304/311/312 extremely hazardous substances**: No products were found.
- **SARA 302/304 emergency planning and notification**: No products were found.
- **SARA 302/304/311/312 hazardous chemicals**: Aluminium oxide; Disodium oxide; Magnesium oxide; Quartz (SiO2)
- **SARA 311/312 MSDS distribution - chemical inventory - hazard identification**:
  - Aluminium oxide: Immediate (acute) health hazard; Disodium oxide: Immediate (acute) health hazard; Magnesium oxide: Immediate (acute) health hazard; Quartz (SiO2): Immediate (acute) health hazard, Delayed (chronic) health hazard

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15. Regulatory information

Clean Air Act Section 112(b) Hazardous Air Pollutants (HAPs): Not listed
Clean Air Act Section 602 Class I Substances: Not listed
Clean Air Act Section 602 Class II Substances: Not listed
DEA List I Chemicals (Precursor Chemicals): Not listed
DEA List II Chemicals (Essential Chemicals): Not listed

SARA 313

<table>
<thead>
<tr>
<th>Product name</th>
<th>CAS number</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form R - Reporting requirements Aluminium oxide</td>
<td>1344-28-1</td>
<td>15 - 40</td>
</tr>
<tr>
<td>Supplier notification       Aluminium oxide</td>
<td>1344-28-1</td>
<td>15 - 40</td>
</tr>
</tbody>
</table>

SARA 313 notifications must not be detached from the MSDS and any copying and redistribution of the MSDS shall include copying and redistribution of the notice attached to copies of the MSDS subsequently redistributed.

State regulations

Massachusetts: The following components are listed: AMORPHOUS SILICA; ALUMINUM OXIDE; MAGNESIUM OXIDE FUME; SILICA, CRYSTALLINE, QUARTZ
New York: None of the components are listed.
New Jersey: The following components are listed: ALUMINUM OXIDE; alpha-ALUMINA; MAGNESIUM OXIDE; SILICA, QUARTZ; QUARTZ (SiO2)
Pennsylvania: The following components are listed: SILICA; ALUMINUM OXIDE (AL2O3); MAGNESIUM OXIDE (MGO); QUARTZ (SiO2)

California Prop. 65

WARNING: This product contains a chemical known to the State of California to cause cancer.

<table>
<thead>
<tr>
<th>Ingredient name</th>
<th>Cancer</th>
<th>Reproductive</th>
<th>No significant risk level</th>
<th>Maximum acceptable dosage level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quartz (SiO2)</td>
<td>Yes.</td>
<td>No.</td>
<td>No.</td>
<td>No.</td>
</tr>
</tbody>
</table>

16. Other information

Label requirements: CAUSES RESPIRATORY TRACT, DIGESTIVE TRACT, EYE AND SKIN BURNS. CONTAINS MATERIAL THAT MAY CAUSE TARGET ORGAN DAMAGE, BASED ON ANIMAL DATA. SUSPECT CANCER HAZARD - CONTAINS MATERIAL WHICH MAY CAUSE CANCER.

Date of issue: 01/16/2013
Date of previous issue: No previous validation.
Version: 1

Indicates information that has changed from previously issued version.

Notice to reader

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