MOLSIV® ADSORBENT Type 4A

Description

MOLSIV® ADSORBENT Type 4A, the sodium form of the Type A crystal structure, is an alkali metal alumino-silicate. Type 4A will adsorb molecules with critical diameters up to 4 angstroms.

Applications

Type 4A is the preferred Molecular Sieve adsorbent for static dehydration in a closed gas or liquid system. It is used in packaging of drugs, electronic components, and perishable chemicals, and as a water scavenger in paint and plastic systems. Type 4A is also used commercially in drying saturated hydrocarbon streams.

All molecules which can be adsorbed on Molecular Sieve Type 3A can be adsorbed on Molecular Sieve Type 4A.

Chemical Formula

\[ \text{Na}_{10}[(\text{AlO}_2)_3(\text{SiO}_2)_2] \cdot \text{X H}_2\text{O} \]

Regeneration

MOLSIV® ADSORBENT Type 4A can be regenerated for re-use by purging or evacuating at elevated temperatures. The degree of regeneration (water removal) is dependent on the temperature and humidity of the purge gas.

Shipping Information

MOLSIV® ADSORBENT Type 4A is available in powder form, 1/16-in. and 1/8-in. pellets, 8×12 and 4×8 beads, and 14×30 mesh. It is shipped in non-returnable steel containers.

<table>
<thead>
<tr>
<th>Container Size</th>
<th>Powder</th>
<th>Pellets</th>
<th>Beads</th>
<th>Mesh</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 gal.</td>
<td>2</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>10 gals.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22 gals.</td>
<td>50</td>
<td></td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>55 gals.</td>
<td>150</td>
<td>300</td>
<td>300</td>
<td>300</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Typical Properties</th>
<th>1/16' Pellets</th>
<th>1/8' Pellets</th>
<th>14×30 Mesh</th>
<th>8×12 Beads</th>
<th>4×8 Beads</th>
<th>Powder</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal Pore Diameter</td>
<td>4 Angstroms</td>
<td>4 Angstroms</td>
<td>4 Angstroms</td>
<td>4 Angstroms</td>
<td>4 Angstroms</td>
<td>4 Angstroms</td>
</tr>
<tr>
<td>Bulk Density</td>
<td>42 lb/cu ft</td>
<td>43 lb/cu ft</td>
<td>40 lb/cu ft</td>
<td>45 lb/cu ft</td>
<td>42 lb/cu ft</td>
<td>-</td>
</tr>
<tr>
<td>Hydrated Wet Density</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>2.03 g/cc</td>
</tr>
<tr>
<td>Activated Dry Density</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1.57 g/cc</td>
</tr>
<tr>
<td>Particle Diameter</td>
<td>0.0575 in.</td>
<td>0.115 in.</td>
<td>0.0232 in.</td>
<td>0.0661 in.</td>
<td>0.0937 in.</td>
<td>&lt;10 microns*</td>
</tr>
<tr>
<td>to 0.0775 in.</td>
<td>to 0.135 in.</td>
<td>to 0.0555 in.</td>
<td>to 0.0937 in.</td>
<td>to 0.187 in.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crush Strength</td>
<td>9 lbs</td>
<td>17 lbs</td>
<td>-</td>
<td>6.4 lbs</td>
<td>18 lbs</td>
<td>Cubic</td>
</tr>
<tr>
<td>Crystal Structure</td>
<td>1800</td>
<td>1800</td>
<td>1800</td>
<td>1800</td>
<td>1800</td>
<td>1800</td>
</tr>
<tr>
<td>Heat of Adsorption (max.)</td>
<td>1800</td>
<td>1800</td>
<td>1800</td>
<td>1800</td>
<td>1800</td>
<td>btu/lb H,O</td>
</tr>
<tr>
<td>Equilibrium H₂O Capacity**</td>
<td>&lt;22% wt</td>
<td>&lt;22% wt</td>
<td>&lt;22% wt</td>
<td>&lt;22% wt</td>
<td>&lt;22% wt</td>
<td>26.0% wt</td>
</tr>
<tr>
<td>Water Content (as shipped)</td>
<td>&lt;1.5% wt</td>
<td>&lt;1.5% wt</td>
<td>&lt;1.5% wt</td>
<td>&lt;1.5% wt</td>
<td>&lt;1.5% wt</td>
<td>&lt;2.5% wt</td>
</tr>
</tbody>
</table>

Molecules Adsorbed

Molecules with an effective diameter <4 angstroms, including ethanol, H₂S, CO₂, SO₂, C₂H₆, C₃H₈, C₄H₁₀

Molecules Excluded

Molecules with an effective diameter >4 angstroms, e.g., propane

*Agglomerate particle size. Average crystal size is 1.0 to 4.0 microns.
**Lbs H₂O/100 lbs activated adsorbent at 17.5 mm Hg, 25°C.
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