MOLSIV® ADSORBENT Type 5A

Description

MOLSIV® ADSORBENT Type 5A, the calcium form of the Type A crystal structure, is an alkali metal alumino-silicate. Type 5A will adsorb molecules with critical diameters up to 5 angstroms.

Applications

Type 5A is the Molecular Sieve adsorbent which made possible the separation of normal paraffins from branched-chain and cyclic hydrocarbons through a selective adsorption process. It is now used commercially in large-scale n-paraffin separation processes.

All molecules which can be adsorbed on Molecular Sieve Type 3A and 4A can be adsorbed on Type 5A.

Chemical Formula

\[ \text{Ca}_{x_2}\text{Na}_4(\text{AlO}_2)_6(\text{SiO}_2)_6) \cdot \text{X H}_2\text{O} \]

Regeneration

MOLSIV® ADSORBENT Type 5A 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 5A is available as powder, 1/16-in. and 1/8-in. pellets. It is shipped in non-returnable metal containers.

<table>
<thead>
<tr>
<th>Container Size</th>
<th>Net Weight in lbs.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pellets</td>
</tr>
<tr>
<td>1 gal.</td>
<td>5</td>
</tr>
<tr>
<td>10 gals.</td>
<td>50</td>
</tr>
<tr>
<td>22 gals.</td>
<td></td>
</tr>
<tr>
<td>55 gals.</td>
<td>300</td>
</tr>
</tbody>
</table>

Typical Properties

<table>
<thead>
<tr>
<th></th>
<th>1/16&quot; Pellets</th>
<th>1/8&quot; Pellets</th>
<th>Powder</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal Pore Diameter</td>
<td>5 Angstroms</td>
<td>5 Angstroms</td>
<td>5 Angstroms</td>
</tr>
<tr>
<td>Poured Density (average)</td>
<td>40 lb/cu ft</td>
<td>40 lb/cu ft</td>
<td>-</td>
</tr>
<tr>
<td>Settled Bulk Density</td>
<td>44 lb/cu ft</td>
<td>44 lb/cu ft</td>
<td>2.03 g/cc</td>
</tr>
<tr>
<td>Hydrated Particle Density</td>
<td>-</td>
<td>-</td>
<td>1.57 g/cc</td>
</tr>
<tr>
<td>Activated Particle Density</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Particle Diameter</td>
<td>0.0575 in. to 0.0775 in.</td>
<td>0.115 in. to 0.135 in.</td>
<td>&lt;10 microns*</td>
</tr>
<tr>
<td>Crush Strength</td>
<td>7 lbs</td>
<td>12 lbs</td>
<td>Cubic</td>
</tr>
<tr>
<td>Crystal Form</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Heat of Adsorption (max.)</td>
<td>1800 btu/lb H₂O</td>
<td>1800 btu/lb H₂O</td>
<td>1800 btu/lb H₂O</td>
</tr>
<tr>
<td>Equilibrium H₂O Capacity**</td>
<td>21.5% wt</td>
<td>21.5% wt</td>
<td>26% wt</td>
</tr>
<tr>
<td>Water Content (as shipped)</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 < 5 angstroms, including \( \text{C}_x\text{H}_y \), n-\( \text{C}_x\text{H}_{10} \) to \( \text{C}_{22}\text{H}_{46} \), n-\( \text{C}_x\text{H}_{10} \)OH and larger family members, R-12 and R-22

Molecules Excluded Molecules with an effective diameter > 5 angstroms, e.g., iso compounds and all 4 carbon rings

*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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