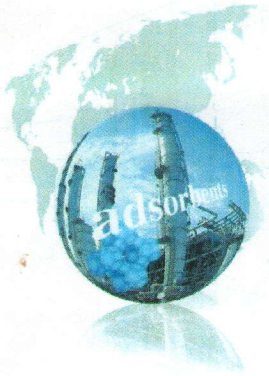


4A MOLSIV™ ADSORBENT

DESCRIPTION

4A MOLSIV Adsorbent is a clay-bound sodium form of Type A molecular sieve. 4A molecular sieve will adsorb molecules with critical diameters up to 4 angstroms. It adsorbs water and ethanol, but not larger molecules like propane.

APPLICATION

4A molecular sieve is recommended for the dehydration of air in hopper (plastic) drying units and pressure swing (PSA) dehydrators. Its exceptional product strength makes 4A ideal for sachet and other custom packaged desiccating needs.

CHEMICAL FORMULA

$M_x [(AlO_2)_x(SiO_2)_y] \cdot z\ H_2O$ [M=Na]

REGENERATION

4A molecular sieve can be regenerated for re-use by purging or evacuating at elevated temperatures. The degree of regeneration is dependent on the temperature and humidity of the purge gas.

SAFETY AND SAFE HANDLING

See the UOP brochure "Precautions and Safe Practices for Handling Molecular Sieves in Process Units" or call your UOP representative.

SHIPPING INFORMATION

4A is shipped in steel drums or Quick-Load bags.

TYPICAL PHYSICAL PROPERTIES

4A molecular sieve is available in granular, spherical or extrudate form. The nominal sizes of the granules and spheres or "beads" are shown below. The diameters for the extrudates or "pellets" are also shown; the length is approximately twice the diameter.

	14 x30 granular	10x20 Beads	8x12 Beads	4x8 Beads	1/16" Pellets	1/8" Pellets
Nominal Pore Diameter (angstroms)	4	4	4	4	4	4
Particle Size Diameter (mm)	0.8	1.4	2.0	4.0	1.6	3.2
Bulk Density (lbs/ft³)	44	44	44	44	44	44
Heat of Adsoption (Btu/lb H_2O)	1800	1800	1800	1800	1800	1800
Crush Strength (lbs)	N/A	N/A	7	18	10	20
Equilibrium H_2O Capacity* (wt-%)	22	22	22	22	22	22
Moisture content (wt-%)	1	1	1	1	1	1

*Measured at 17.5 mm Hg and 25°C

FOR MORE INFORMATION

UOP also offers specialty 4A products: 4A-DG for natural gas and saturated hydrocarbon dehydration; 4A-LNG for natural gas purification for cryogenic storage. For more information on any of these products, contact your UOP representative, or UOP's Adsorbents business at:

Telephone: 1-440-734-0086
Fax: 1-440-734-1688
E-mail: Adsorbents@uop.com

UOP 3102-119 0403A0D

MOLSIV™ Adsorbents

UOP LLC
25 East Algonquin Road
Des Plaines, IL 60017-5017
www.uop.com

13X-APG MOLSIV™ ADSORBENT

DESCRIPTION

13X-APG adsorbent is the sodium form of the Type X molecular sieve and an alkali metal aluminosilicate. 13X-APG adsorbent will adsorb molecules with critical diameters up to 8 angstroms.

APPLICATIONS

13X-APG adsorbent is specifically developed for air plant feed purification. It has a high capacity for carbon dioxide and water and maintains its capacity well above ambient conditions. It is available in a variety of shapes and sizes to suit your operating needs.

In addition, 13X-APG adsorbent can adsorb molecules, such as olefins, aromatics, straight and branch chain hydrocarbons, SO_x, and NO_x compounds.

CHEMICAL FORMULA

$Na_x [(AlO_2)_x(SiO_2)_y] \cdot z\ H_2O$

REGENERATION

13X-APG adsorbent can be regenerated for re-use by purging at elevated temperatures or at compressor waste heat temperatures.

SAFETY AND HANDLING

See the UOP brochure entitled "Precautions and Safe Practices for Handling Molecular Sieves in Process Units" or contact your UOP representative.

SHIPPING INFORMATION

13X-APG MOLSIV adsorbent is shipped in 55-gallon steel drums or quick load bags.

TYPICAL PHYSICAL PROPERTIES

13X-APG sieve is available in sphere or extrudate form. The diameters for the spheres or "beads" are shown below. The diameters for the extrudates or "pellets" are also shown; the length is approximately twice the diameter.

	1/16" Pellets	1/8" Pellets	TRISIV™ Pellets	8x12 Beads	6x8 Beads	4x8 Beads
Bulk density (lbs/ft³)	38	38	36	40	40	40
Particle diameter (mm)	1.6	3.2	3.2	2.0	3.0	4.0
Crush strength (lbs)	7	15	15	8	12	18
Equilibrium CO_2 capacity[1] (wt-%)	18.5	18.5	18.5	18.5	18.5	18.5
Equilibrium H_2O capacity[2] (wt-%)	27	27	27	27	27	27
Water content, as shipped (wt-%)	<1	<1	<1	<1	<1	<1

[1] Measured at 250 mm Hg and 25 °C
[2] Measured at 17.5 mm Hg and 25 °C

FOR MORE INFORMATION

For more information, contact your UOP representative or UOP's Adsorbents business at:

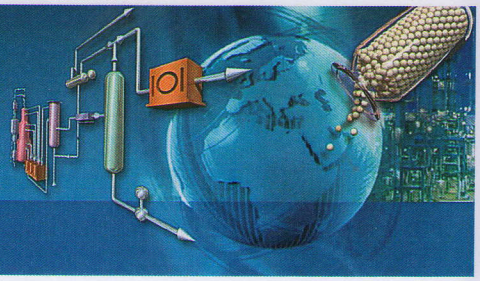
Telephone: 1-440-734-0086
Fax: 1-440-734-1688
E-mail: Adsorbents@uop.com

UOP 3102-90 0103A0Dv

MOLSIV™ Adsorbents

UOP LLC
25 East Algonquin Road
Des Plaines, IL 60017-5017
www.uop.com

UOP
A Honeywell Company



UOP MOLSIV™ 13X APG Adsorbent

Adsorbents

Adsorbents

Description

UOP 13X APG adsorbent is the sodium form of the Type X molecular sieve and an alkali metal aluminosilicate. 13X APG molecular sieve will adsorb molecules with critical diameters up to 10 angstroms.

Applications

13X APG adsorbent is specifically developed for air plant feed purification. It has a high capacity for carbon dioxide and water and maintains its capacity well above ambient conditions. It is available in a variety of shapes and sizes to suit your operating needs.

Typical physical properties (nominal)

13X APG molecular sieve is available in sphere or extrudate form. The diameters for the spheres or "beads" are shown below. The diameters for the extrudates or "pellets" are also shown; the length is approximately twice the diameter.

	8x12 Beads	6x8 Beads	4x8 Beads	1/16" Pellets	1/8" Pellets	TRISIV™ Pellets
Nominal pore diameter (Å)	10	10	10	10	10	10
Nominal particle size diameter (mm)	2.0	3.0	4.0	1.6	3.2	3.2
Bulk density (lb/ft^3)	40	40	40	38	38	36
(kg/m^3)	640	640	640	610	610	575
Crush strength (lb_f)	8	12	18	8	18	15
(N)	35.6	53.4	80.1	35.6	80.1	66.7
Equilibrium CO_2 capacity[1] (Wt%)	3.6	3.6	3.6	3.6	3.6	3.6
Equilibrium H_2O capacity[2] (Wt%)	27	27	27	27	27	27
Water content, as shipped (Wt%)	<1	<1	<1	<1	<1	<1

[1] Measured at 2 mm Hg and 25 °C
[2] Measured at 17.5 mm Hg and 25 °C

Chemical Formula

$M_x [(AlO_2)_x(SiO_2)_y] \cdot z\ H_2O$ [M=Na]

Regeneration

13X APG adsorbent can be regenerated for reuse by purging at elevated temperatures.

Safety and handling

See the UOP brochure entitled "Precautions and Safe Practices for Handling Molecular Sieves in Process Units" or contact your UOP representative.

Shipping information

13X APG adsorbent is shipped in 55-gallon steel drums or quick load bags.

For more information

For more information, contact your local UOP representative or our Des Plaines sales office:

e-mail: info@uop.com
fax: +1-847-391-2253
phone: +1-847-391-2000

UOP LLC, A Honeywell Company
25 East Algonquin Road
Des Plaines, IL 60017-5017, U.S.A.
www.uop.com

UOP 4512-23 1011

UOP
A Honeywell Company

UOP
A Honeywell Company

UOP MOLSIV™ 13X HP Adsorbent

High performance molecular sieve for contaminant removal from hydrocarbon streams

Protect your catalysts from being poisoned and meet your stringent product specifications by efficiently removing water and other contaminants from hydrocarbon process streams.

Description

UOP MOLSIV 13X HP adsorbent is a high-performance, spherical alkali aluminosilicate that will adsorb molecules with critical diameters up to 8 angstroms.

Applications

13X HP molecular sieve is a high-capacity adsorbent for drying and purifying liquid hydrocarbon streams. This could involve removal of trace sulfur species (H_2S, disulfides, mercaptans, etc.) and/or oxygenates (alcohols, ethers, ketones, etc.). 13X HP adsorbent can also be used to purify monomer and solvent process streams in polyethylene and polypropylene plants.

Typical physical properties (nominal)

	10x20 Beads	8x12 Beads
Nominal pore diameter (Å)	10	10
Bulk density (lb/ft³)	41	40
(kg/m³)	657	641
Heat of adsorption		
(Btu/lb H_2O)	1800	1800
(kJ/kg H_2O)	4186	4186
Moisture content (Wt%)	<1.5	<1.5
Equilibrium CO_2		
Capacity* (Wt%)	28.5	28.5
Crush strength (lb_f)	3	6
(N)	13.3	26.7

* Measured at 250 mm Hg and 25°C

Chemical formula

$M_x [(AlO_2)_x (SiO_2)_y] \bullet z H_2O$ [M = Na]

Regeneration

13X HP adsorbent can be regenerated for reuse by purging at elevated temperatures.

Safety and handling

See the UOP brochure entitled "Precautions and Safe Practices for Handling Molecular Sieves in Process Units" or contact your UOP representative.

Shipping information

UOP MOLSIV 13X HP adsorbent is shipped in 55-gallon steel drums or quick load bags.

For more information

For more information on UOP 13X HP adsorbent or other UOP adsorbents, please contact your UOP representative or visit us online at www.uop.com.

UOP LLC, A Honeywell Company
25 East Algonquin Road
Des Plaines, IL 60017-5017, U.S.A.
www.uop.com

UOP 4512-163 July, 2011r