Molecular Sieve 5A and 13X

Packed GC Columns for Permanent Gas Separations

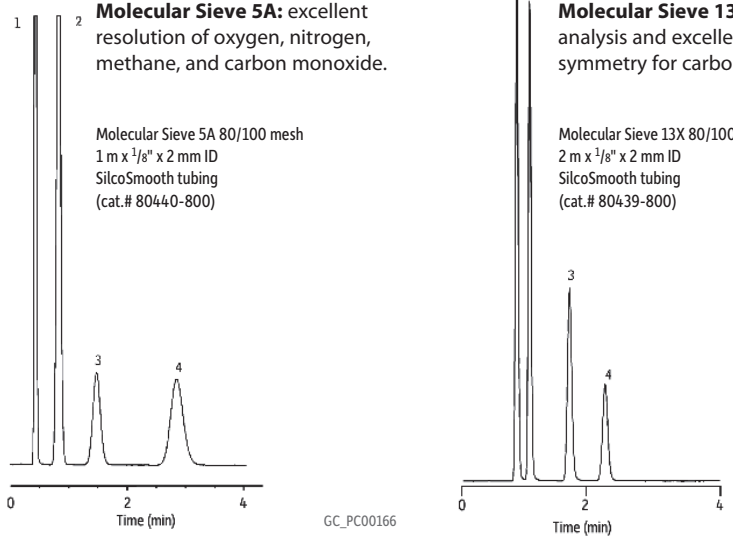
Molecular sieves, synthetic forms of Zeolite packing, have been used since the 1950s for separating light gases (oxygen, nitrogen, methane, and carbon monoxide) and inert gases (helium, argon, neon, krypton, and xenon), yet there have been few changes or improvements in their basic composition or performance. Restek has designed the two most common molecular sieves—5A and 13X, as high-performance packings that feature batch-to-batch inertness and consistency. These packings are used in a wide range of packed and PLOT column analyses.

Molecular sieve 5A and 13X packings differ in pore size and composition, causing differences in retention and selectivity for many gases. The 5A packing provides greater retention, which improves the separation of argon, oxygen, and nitrogen, and is a better choice for analyzing the trace impurities in inert gases typically used in the semiconductor industry. The 13X packing often is preferred for analysis of carbon monoxide, particularly at trace concentrations, because lower retention results in sharper chromatographic peaks and improved detection limits.

Molecular Sieve 5A or 13X Packing in Silcosteel Treated Tubing Exhibits Excellent Chromatography for Permanent Gas Analysis

Figure 1 compares a gas mixture analyzed using a 1-meter, high-performance molecular sieve 5A column and a 2-meter, high-performance molecular sieve 13X column. Notice the excellent peak symmetry for carbon monoxide on each column, indicating that the packing and column tubing are extremely inert. Combining high-quality molecular sieves with Silcosteel-treated tubing produces a packed column optimized for trace analysis of the difficult components oxygen and carbon monoxide.

Figure 1: Permanent gases on Molecular Sieve 5A and Molecular Sieve 13X packed columns.



Molecular Sieve 5A: excellent resolution of oxygen, nitrogen, methane, and carbon monoxide.

Molecular Sieve 5A 80/100 mesh
1 m x 1/8" x 2 mm ID
SilcoSmooth tubing
(cat.# 80440-800)

GC_PC00166

Molecular Sieve 13X: rapid analysis and excellent peak symmetry for carbon monoxide.

Molecular Sieve 13X 80/100 mesh
2 m x 1/8" x 2 mm ID
SilcoSmooth tubing
(cat.# 80439-800)

Peaks
1. Oxygen
2. Nitrogen
3. Methane
4. Carbon monoxide

Columns	Molesieve 5A 1 m, 2 mm ID (cat.# 80440-800) and Molesieve 13X 2 m, 2 mm ID (cat.# 80439-800)
Sample	5-10% each component, balance helium
Injection	
Inj. Vol.:	10 µL Direct
Inj. Temp.:	150 °C
Oven	
Oven Temp.:	50 °C
Carrier Gas	He, constant flow
Flow Rate:	30 mL/min
Detector	TCD @ 200 °C

Quality Testing Ensures Reproducibility

Each lot of Zeolite packing is purified to remove metals and other trace contaminants that can adsorb trace gases, such as carbon monoxide. Then, every batch is carefully classified to precise mesh ranges, ensuring lot-to-lot reproducibility. Our thermal conditioning process is critical for establishing the relative retention of methane/carbon monoxide and for producing excellent peak symmetry for active compounds like carbon monoxide. As a result, each lot of molecular sieve is precisely produced, conditioned, and QA tested for reproducible efficiency, column back pressure, peak symmetry, and relative retention time, using a permanent gas performance mixture.

Column Configuration Key:
-800 General—General Configuration
-810 Agilent—(HP) 5880, 5890, 5987, 6890, 7980
-820 Scion (Bruker 430, 450) (Varian 3700, Vista Series, FID)
-830 PE/Sigma—PE 900-3920, Sigma 1, 2, 3
-840 PE Auto Sys—PE Auto System 8300/8400/8700, Clarus 500
-850 Shimadzu 14A—Shimadzu 14A, 2014
Other column configurations available.

Molecular Sieve Packed Columns

Molecular sieve packed columns easily separate permanent gases at above-ambient temperatures. Restek's R&D chemists have developed a process for preparing molecular sieve packings, which result in excellent batch-to-batch reproducibility. In addition, our molecular sieves are preactivated and ready to use. Each column comes with metal end fittings to prevent water or carbon dioxide from adsorbing into the packing during shipment.

		Stainless Steel Tubing				SilcoSmooth Tubing**			
Molecular Sieve	Mesh	L (ft)	OD (in)	ID (mm)	cat.#*	L (m)	OD (in)	ID (mm)	cat.#*
Molesieve 5A	60/80	6	1/8	2.1	80473-	2	1/8	2.0	80428-
Molesieve 5A	80/100	3	1/8	2.1	88015-	1	1/8	2.0	80440-
Molesieve 5A	80/100	6	1/8	2.1	80474-	2	1/8	2.0	80429-
Molesieve 5A	80/100	10	1/8	2.1	88014-	3.05	1/8	2.0	80430-
Molesieve 13X	60/80	6	1/8	2.1	80475-	2	1/8	2.0	80480-
Molesieve 13X	80/100	6	1/8	2.1	80476-	2	1/8	2.0	80439-

*Please add column instrument configuration suffix number to cat.# when ordering.
**Siltek-treated stainless steel.

Custom packed and micropacked columns also available by request.

Micropacked GC Columns

- Increased efficiency over traditional packed columns.
- Higher capacity than PLOT columns.
- Made from inert, flexible SilcoSmooth tubing.
- Wide range of packings available.
- Standard coils fit all instruments. No special instrument configurations required.

Molecular Sieve	Mesh	ID	OD	Temp. Range	1-Meter cat.#	2-Meter cat.#
Molesieve 5A	80/100	0.53 mm*	0.74 mm	up to 300 °C		19041
Molesieve 5A	80/100	0.75 mm	0.95 mm	up to 300 °C	19002	19003
Molesieve 5A	80/100	1.00 mm	1/16"	up to 300 °C	19000	19001
Molesieve 13X	80/100	0.75 mm	0.95 mm	up to 350 °C	19006	19007
Molesieve 13X	80/100	1.00 mm	1/16"	up to 350 °C	19004	19005

*Due to the small internal diameter of 0.53 mm ID columns, braided wire end plugs cannot be used; wool is inserted into the ends instead.

RESTEK
Pure Chromatography

Questions? Contact us or your local Restek representative (www.restek.com/contact-us).

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QUALITY ISO 9001 · 17025 · 17034

Lit. Cat.# PCAR2969-UNV