

Carbon Adsorbent Kits

Having trouble finding the proper carbon adsorbent for the innovative application you're developing?

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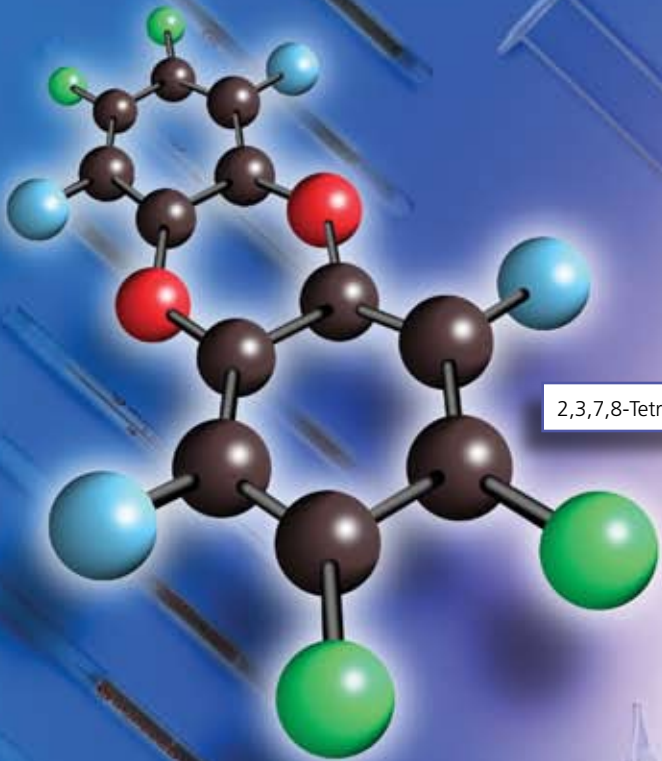
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S SUPELCO



2,3,7,8-Tetrachlorodibenzo-p-dioxin

Try a Carbon Adsorbent Sampler Kit from Supelco!

Often choosing the right adsorbent or combination of adsorbents can be difficult. The goal in selecting the proper adsorbent is to choose one or more that can retain a specific analyte, or group of analytes, for a specific sample volume. However, equally important is that the adsorbent(s) must also be able to release the analyte(s) during the desorption process.

By using one of the Supelco Carbon Adsorbent Sampler Kits, the method developer obtains a cost-effective way to evaluate several carbon adsorbents when designing adsorbent-based applications and products. Once the appropriate material has been identified, Supelco is ready to work with you to produce larger quantities to your specifications.



Graphitized Carbon Black (GCB)

Unlike activated charcoals, which are porous, graphitized carbon blacks (GCBs) generally are non-porous. Consequently, the entire surface of these materials is available for interactions that depend solely on dispersion (London) forces. Since we prepare our GCBs at temperatures >2500 °C, the high purity nature of the resulting carbon material ensures effective release/desorption of the analytes of interest. Carbotrap signifies material that is larger than 40 mesh (e.g. 20/40), whereas Carbopack signifies material that is smaller than 40 mesh (e.g. 60/80).

Carbon Molecular Sieve (CMS)

A carbon molecule sieve (CMS) particle is the carbon skeletal framework remaining after the pyrolysis of a polymeric precursor. These materials are primarily used for collecting very small molecular-sized compounds (C2-C5). The size and shape of the analyte molecule and the size and shape of the pores in the CMS particle determine how well the analyte is adsorbed and desorbed. Since our CMSs are prepared from high purity polymers, the resulting material is a high purity carbon material, effective in the release/desorption of adsorbed analytes for quantification.

Related Products

Supelco offers a wide range of empty glass or stainless steel tubes for thermal desorption, polypropylene tubes for solid phase extraction, and other accessories necessary to pack your own tubes. Please refer to the Supelco catalog or visit our web site sigma-aldrich.com/supelco

Supelco's commitment to carbon adsorbent technology has been on-going for more than two decades. This effort has been critical to the advancement of chromatography products like GC columns and sample preparation products. Today Supelco has over 87 different carbons ranging in particle size from 1-1000 microns and surface areas from 1-1500m²/g.

Our efforts have been broad in scope, and have ranged from purification process development to research focusing on the thermodynamic and kinetic properties of adsorbents. Understanding the performance characteristics of adsorbents has been our primary goal.

The unique and valuable characteristics of the Supelco carbons warranted their inclusion in experiments on the 1995 Galileo Mission to Jupiter and the 2005 Cassini-Huygens Mission to Titan, Saturn's largest moon. Supelco carbons will make their next venture into space with the 2007 Mars Mission.

General Guidelines for Choosing Carbon Adsorbents

For multi-bed tubes, use the weaker adsorbent in front of the stronger adsorbent. For example, use Carbopack C in front of Carbopack B.

Relative Analyte Size ¹	Recommended Materials (listed weakest to strongest)
>C20	Carbotrap F, Carbopack F
C12-C20	Carbotrap C, Carbopack C, Carbotrap Y, Carbopack Y
C5-C12	Carbotrap B, Carbopack B
C3-C9	Carboxen 1016, Carbotrap X, Carbopack X, Carbopack Z
C2-C5	Carboxen 569, Carbosieve G, Carboxen 1000, Carbosieve S-III, Carboxen 1021, Carboxen 1018, Carboxen 1003, Carboxen 1012

¹Analyte size relative to n-Alkanes. Consider all atoms, not just Carbon. For example, even though 1,2-Dichloroethane is a C2, the two Chlorine atoms give it a relative size between C4 and C5.

Related Information

For more in-depth information, visit sigma-aldrich.com/supelco, and view T402025, "A Tool for Selecting an Adsorbent for Thermal Desorption Applications" which includes adsorption/desorption data on 43 common air pollutants on 24 different adsorbents, and T402026, "Characterization of Adsorbents for Sample Preparation Process" which describes the past, present, and future of carbon adsorbent research at Supelco.

Application Assistance

Need help determining which kit best suits your application? Please give us a call. Our Technical Service chemists can be reached at 800-359-3041 (US and Canada)/ 814-359-3041 or techservice@sial.com

ordering: 800-247-6628 (US only) / 814-359-3441 technical service: 800-359-3041 (US and Canada only) / 814-359-3041

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Physical Characteristics of Supelco Carbon Adsorbents

Adsorbent	BET surface area [▲] (m ² /g)	Density (g/mL)	Porosity (cc/g)			Micropore Diameter (Å)
			micro-	meso-	macro-	
Carbotrap Kit (20/40 mesh graphitized carbon black)						
Carbotrap™ F	5	0.69	-	-	-	-
Carbotrap C	10	0.68	-	-	-	-
Carbotrap Y	24	0.45	-	-	-	-
Carbotrap B	100	0.37	-	-	-	-
Carbotrap X	240	0.43	-	0.62	-	100
Carbopack Kit (60/80 mesh graphitized carbon black)						
Carbopack™ F	5	0.64	-	-	-	-
Carbopack C	10	0.68	-	-	-	-
Carbopack Y	24	0.42	-	-	-	-
Carbopack B	100	0.35	-	-	-	-
Carbopack Z	220	0.18	-	1.73	-	255
Carbopack X	240	0.41	-	0.62	-	100
Carbon Molecular Sieve Kit						
Carboxen™-1016	75	0.40	-	0.34	-	-
Carboxen-569	485	0.58	0.20	0.14	0.10	5 - 8
Carboxen-1021▼	600	0.62	0.30	-	-	5 - 8
Carboxen-1018▼	675	0.60	0.35	-	-	6 - 8
Carbosieve S-III*	975	0.61	0.35	0.04	-	4 - 11
Carboxen-1003	1000	0.46	0.38	0.26	0.28	5 - 8
Carbosieve™ G	1160	-	0.49	0.02	-	6 - 15
Carboxen-1000	1200	0.48	0.44	0.16	0.25	10 - 12
Carboxen-1012	1500	0.50	-	0.66	-	19 - 21

▲ Brunauer, Emmett, Teller (BET) surface area calculations

▼ Microporous, monoporously carbon sieve

* Closed pore structure

Don't see a carbon with the physical characteristics you need? Contact us to inquire about our custom capabilities!

Carbon Adsorbent Sampler Kits

Small quantities of Supelco carbon adsorbents for use by researchers and method developers.

Description	Qty.	Cat. No.
Graphitized Carbon Black Kit (20/40)		
Carbotrap B	5 g	13027-U
Carbotrap C	5 g	
Carbotrap F	5 g	
Carbotrap X	5 g	
Carbotrap Y	5 g	
Graphitized Carbon Black Kit (60/80)		
Carbopack B	5 g	13026-U
Carbopack C	5 g	
Carbopack F	5 g	
Carbopack X	5 g	
Carbopack Y	5 g	
Carbon Molecular Sieve Kit		
60/80 Carbosieve G	5 g	13028-U
60/80 Carbosieve S-III	5 g	
20/45 Carboxen-569	5 g	
60/80 Carboxen-1000	5 g	
40/60 Carboxen-1003	5 g	
80/120 Carboxen-1012	5 g	
60/80 Carboxen-1016	5 g	
60/80 Carboxen-1018	5 g	
60/80 Carboxen-1021	5 g	

TRADEMARKS

Carbosieve, Carbotrap, Carbopack, Carboxen, Supelco - Sigma-Aldrich Co.



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