

Supelco Packed GC Columns for Sulfur Analyses

Product Specification

Supelco offers six GC packings/packed columns developed specifically for separating hydrogen sulfide (H_2S), sulfur dioxide (SO_2), carbon disulfide (CS_2), carbonyl sulfide (COS), alkyl sulfides, mercaptans, and other light sulfur-containing compounds. These packings are:

- Chromosil™ 310
- Chromosil 330
- 40/60 Carbopack™ B HT 100
- Carbopack B/1.5% XE-60/1.0% H_3PO_4
- 12% polyphenyl ether/0.5% H_3PO_4 on 40/60 Chromosorb T
- Supelpak™-S

Chromosil 310

Chromosil 310 is a silica gel that has been specially treated to separate both trace (ppm/ppb) and percent concentrations of sulfur compounds. Because COS is eluted before H_2S , you can use this column to monitor traces of COS in the presence of larger amounts of H_2S .

Prior to use a Chromosil 310 column should be conditioned overnight at $100^\circ C$ with dry carrier gas (nitrogen) at a flow of 20mL/min. The maximum operating temperature for these columns is $100^\circ C$.

Chromosil 330

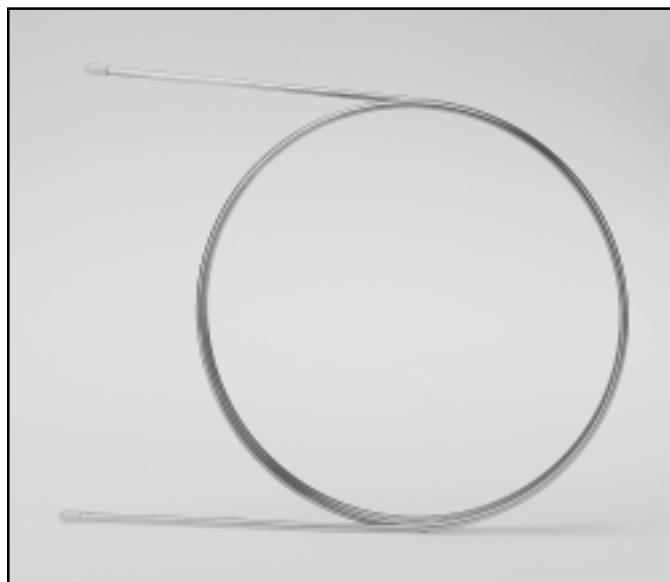
Chromosil 330 is a modified silica gel specifically treated for separating ppb concentrations of light sulfur gases, mercaptans, and alkyl sulfides. At $40^\circ C$, an 8' Teflon (FEP) column of Chromosil 330 separates COS , H_2S , SO_2 , CS_2 , and C1-C3 mercaptans. COS elutes before H_2S , as it does on Chromosil 310. Separate higher molecular weight mercaptans and alkyl sulfides by raising the temperature to $65^\circ C$. Under these conditions the pairs H_2S/COS , ethyl mercaptan/dimethyl sulfide, and propyl mercaptan/ethyl methyl sulfide will not be separated.

Prior to use a Chromosil 330 column should be conditioned overnight at $100^\circ C$ with dry carrier gas (nitrogen) at a flow of 20mL/min. The maximum operating temperature for Chromosil 330 columns is $100^\circ C$.

40/60 Carbopack B HT 100

This packing has been deactivated with hydrogen at $1000^\circ C$ and includes H_3PO_4 for additional deactivation. It will separate H_2S , SO_2 , COS , and CH_3SH at ppm and ppb levels. At $100^\circ C$ it will separate a variety of mercaptans, sulfides, and disulfides.

Prior to use a Carbopack B HT 100 column should be conditioned overnight at $100^\circ C$ with dry carrier gas (nitrogen) at a flow of 20mL/min. The maximum operating temperature for the columns is $150^\circ C$.



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Carbopack B/1.5% XE-60/1.0% H_3PO_4

Carbopack B coated with 1.5% XE-60/1.0% H_3PO_4 is specifically tailored to separate ethyl mercaptan and dimethyl sulfide. Previously, only excessively long columns of polyphenyl ether (PPE) on Chromosorb T would separate these isomers. This packing also separates sulfur hexafluoride (SF_6), H_2S , and COS at ambient temperature – a separation impossible even with long PPE columns.

Condition a new Carbopack B/1.5% XE-60/1.0% H_3PO_4 column overnight at $100^\circ C$ with dry carrier gas (nitrogen) at a flow of 20mL/min. The maximum operating temperature for this packing is $150^\circ C$.

12% Polyphenyl Ether/0.5% H_3PO_4 on 40/60 Chromosorb T

A 36' x 1/8" OD Teflon (FEP) column packed with 12% polyphenyl ether/0.5% H_3PO_4 on 40/60 Chromosorb T was developed to separate H_2S , SO_2 , methyl and ethyl mercaptans, and dimethyl sulfide at ppm and ppb concentrations in air pollution studies. The column can separate a variety of mercaptans, sulfides, and disulfides at $50^\circ C$ and $100^\circ C$. H_2S and COS are not separated. Methyl ethyl sulfide and n-propyl mercaptan are not separated at $100^\circ C$.

Condition a new column overnight at the temperature to be used for the analysis, using dry carrier gas (nitrogen) at a flow of 20mL/min. The maximum operating temperature for the column is $150^\circ C$.

Supelpak-S

Supelpak-S, a specially prepared Porapak® QS packing, was developed to separate low ppm concentrations of H₂S, COS, SO₂, CH₃SH, (CH₃)₂S, and (CH₃)₂S₂ – compounds found in the stack gases of Kraft pulp mills, nylon plants, and petroleum refineries. The erratic performance of Porapak QS for this application is substantially improved with our special washing procedure. Only 18" of the 30" x 1/8" Teflon column is packed with Supelpak-S. The additional unpacked tubing makes it convenient to connect the column to the chromatograph.

In analyses of sulfur compounds that might form in Kraft recovery furnaces, a Supelpak S column offers several advantages:

- water in the stack gas is quickly eluted from the column and does not interfere with the separation of the sulfur gases
- the short length ensures low back pressure
- samples are resolved well
- the column can be temperature programmed to 210°C
- because no liquid phase is used, there is no bleed
- the column can separate H₂S from COS

Condition a new column overnight at 210°C, using dry carrier gas (nitrogen or helium) at a flow of 55mL/min (35psi). Reduce the temperature to 25-30°C, inject a reference standard, program the column to 210°C, and hold 4 minutes. Repeat standard injections until reproducibility is assured. The maximum operating temperature for the column is 210°C (programmed). We recommend using this column with a flame photometric detector.

Ordering Information:

Description	Cat. No.
Chromosil 310, 8' (6' packed) x 1/8" OD Teflon (FEP) Column*	11501
Chromosil 330, 8' (6' packed) x 1/8" OD Teflon (FEP) Column*	11496
40/60 Carbo-pack B HT 100 Packing, 15g	20272
Carbo-pack B HT 100, 1.4m (4.6') x 1/8" OD Teflon (FEP) Column	11502-U
Carbo-pack B/1.5% XE-60/1.0% H ₃ PO ₄ Packing, 15g	11828
12% Polyphenyl ether/0.5% H ₃ PO ₄ on 40/60 Chromosorb T, 36' x 1/8" OD Teflon (FEP) Column	11500
Supelpak-S, 30" (18" packed) x 1/8" OD Teflon Column	12255-U

For chromatograms obtained with these packings, request free Bulletin 722.

Trademarks

Carbo-pack, Chromosil, Supelpak – Sigma-Aldrich Co.
Chromosorb – Celite Corp.
Porapak – Waters Associates, Inc.
Teflon – E.I. du Pont de Nemours & Co., Inc.

* Because high injector and detector temperatures can affect Chromosil packings, 1 foot (25cm) of tubing is left unpacked at the column inlet and the column outlet (e.g., an 8-foot column contains 6 feet of packing).

Contact our Technical Service Department
(phone 800-359-3041 or 814-359-3041, FAX 800-359-3044 or 814-359-5468) for expert answers to your questions.

For more information, or current prices, contact your nearest Supelco subsidiary listed below. To obtain further contact information, visit our website (www.sigma-aldrich.com), see the Supelco catalog, or contact Supelco, Bellefonte, PA 16823-0048 USA.

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