

AMBERCHROM™ CG161 Chromatographic Grade Resin For Chromatographic Purification

Description

AMBERCHROM chromatographic media are macroporous, polymeric resins useful for adsorption and reversed phase liquid chromatography. They are designed for laboratory and process scale purifications of proteins, peptides, nucleic acids, antibiotics, and small molecular weight pharmaceuticals.

AMBERCHROM CG161 chromatographic grade resin is an insoluble polystyrene divinylbenzene polymer manufactured for high value chromatographic applications. Its high surface area, unique pore size and pore volume distribution make it ideally suited for separation of peptides. AMBERCHROM CG161 has high capacity for many pharmaceutical compounds and has been commercially proven for many years. It is an excellent technical and economical alternative to RPC silica, and can be used in high resolution, low pressure chromatography.

AMBERCHROM CG161 is suitable for use in many pharmaceutical applications in the front end capture, purification, and desalting modes of operation depending on the particle size selected.

AMBERCHROM CG161 is available in three different particle size ranges (35, 75, and 120 microns), and is supplied as a slurry in 20% ethanol.

AMBERCHROM CG161 is ideally suited for operation within the entire pH range, and can be easily cleaned in place (CIP) with most organic solvents and dilute acids and bases.

Regulatory Status

A Material Regulatory Support (MRS) package is developed for AMBERCHROM CG161 resin users requiring assistance in supporting use of the resin in regulated applications. It is developed under CDA with users of this product and tailored to the customer's process parameters.

This material is manufactured under strict controls, and plant audits by potential customers are welcomed.

Clean in Place

Unlike RPC silica, AMBERCHROM CG161, due to its polymeric nature and lack of bonded phase, can be cleaned in place (CIP) with most organic solvents and low concentrations of acids and bases. As the graph below demonstrates, there is no loss in capacity for Cephalosporin C after continuous exposure to 0.5 M NaOH for >180 days at ambient temperature and >100 days 60° C.

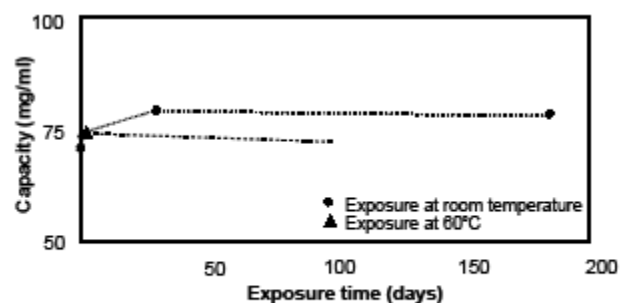


Figure I: Ceph C Adsorption Batch Capacity

In addition to the excellent chemical resistance of AMBERCHROM CG161, it also exhibits low swelling in common solvents as shown below:

Solvent	Swelling
Water	100
Methanol	108
Ethanol	106
Isopropanol	112
Acetonitrile	112
Acetone	114
Toluene	104
Dry	90

Applications

Separation of Penicillin Derivatives

AMBERCHROM CG161 is utilized for the separation of penicillin derivatives 6APA; Penicilin G; Penicilin V. The effective separation was accomplished under the conditions shown below.

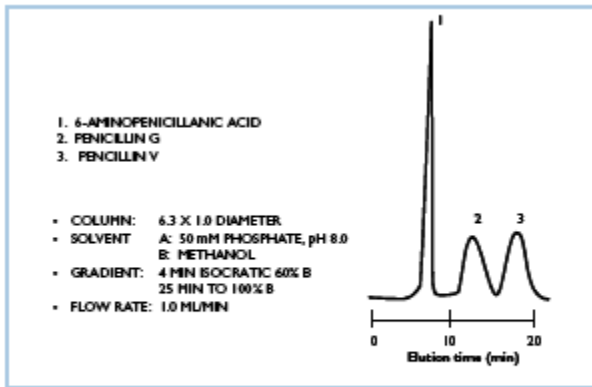


Figure 2: Penicillin Derivatives on Amberchrom CG161

Kinetic Exclusion Chromatography

This application utilizes the size exclusion phenomenon whereby the target molecule is adsorbed and the large size impurities are excluded. During elution, the target molecule may be recovered.

Further purification can be performed if desired.

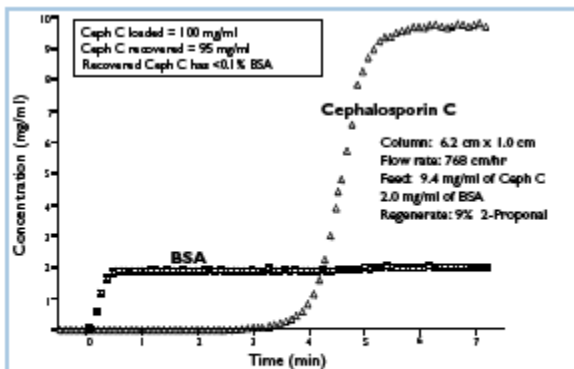


Figure 3: Kinetic Exclusion Chromatography using Amberchrom CG161

Separation of Nucleosides

The graph below demonstrates an excellent separation of 5 nucleosides with AMBERCHROM CG161.

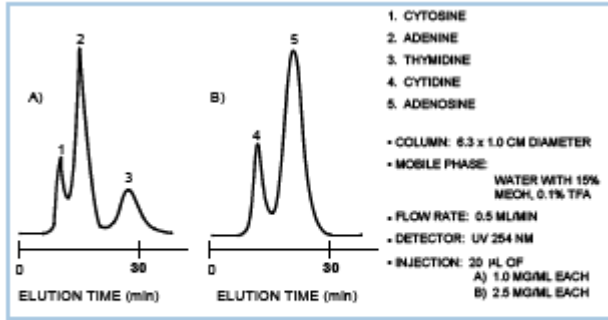


Figure 4: Nucleosides Separation on Amberchrom CG161

IR Spectrum of AMBERCHROM CG161

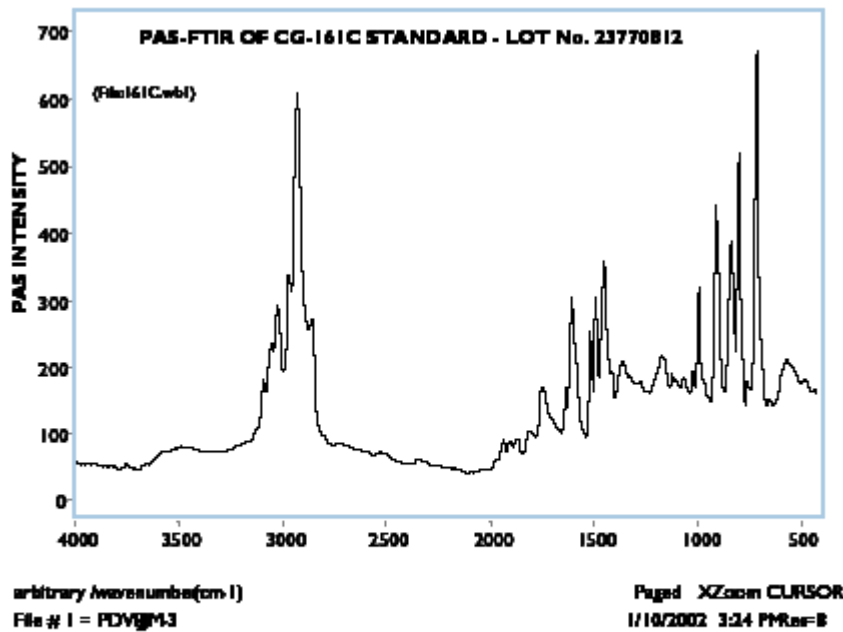


Figure 5: AMBERCHROM CG161 IR Spectrum

Typical Physical Properties

These properties are typical but do not constitute specifications.

Matrix	Polystyrene/Divinylbenzene macroreticular adsorbent
Functional groups	None
Physical form	Opaque white beads
Shipping solvent	20% ethanol
Surface area	900 m ² /g
Pore size ^[1]	150 Å
Mean diameter	S grade: 35 microns M grade: 75 microns C grade: 120 microns
Uniformity coefficient	1.7
Chemical resistance	Insoluble in dilute solutions of acids or bases and common solvents: IPA, ACN, MeOH.

^[1] Test methods are available on request.

Selected References

- Characterization of a family of polymeric resins with average pore diameters of 150, 300, and 1000 for the preparative reverse phase purification of polypeptides; Cartier, Peter G.; Deissler, Karl C.; Maikner, John J.; Kraus, Michael; Spec. Publ. - R. Soc. Chem. (1994), 158 (Separations for Biotechnology 3), 100-5 CODEN: SROCD0; ISSN: 0260- 6291.
- Validation of a theoretical model for adsorption using cephalosporin C and polymeric reversed-phase resins; Firouztale', E.; Maikner, J. J.; Deissler, K. C.; Cartier, P. G.; J. Chromatogr. (1994), 658(2), 361-70 CODEN: JOCRAM; ISSN: 0021-9673.
- The utility of polymeric reversed phase packings for the purification of peptides, proteins and antibiotics; Cartier, P. G.; Deissler, K. C.; Maikner, J. J.; Sep. Biotechnol. 2, [Pap. Int. Symp.], 2nd (1990), 275-84. Editor(s): Pyle, D. L. Publisher: Elsevier, London, UK. CODEN: 56YXAO.
- Use of resins for trichothecene production in liquid cultures; Jarvis, Bruce B.; Armstrong, Catherine A.; Zeng, Ming; J. Antibiot. (1991), 44(3), C1 CODEN: JANTAJ; ISSN: 0021- 8820.
- Analytical- and preparative-scale chromato-graphic separation of phenylalanine from aspartame using a new polymer sorbent; Ladisch, Michael R.; Hendrickson, Richard L.; Firouztale, Edward; J. Chromatogr. (1991), 540(1-2), 85-101 CODEN: JOCRAM; ISSN: 0021-9673.
- Use of resins for trichothecene production in liquid cultures; Jarvis, Bruce B.; Armstrong, Catherine A.; Zeng, Ming; J. Antibiot. (1990), 43(11), 1502-4 CODEN: JANTAJ; ISSN: 0021-8820.
- Automated purification and quantification of oligonucleotides; Ivanetich, K. M.; Reid, R. C.; Ellison, R.; Perry, K.; Taylor, R.; Reschenberg, M.; Mainieri, A.; Zhu, D.; Argo, J.; Cass, D.; Strickland, C.; BioTechniques (1999), 27(4), 810,812,814-818,820,822-823 CODEN: BTNQDO; ISSN: 0736-6205.
- Purification of LL-AO341 antibiotics derived from fermentation broth by large scale preparative reversed phase chromatography on Amberchrom CG161 M.; Williams, David R.; Lee, M. D.; Pinho, F.; Borders, D. B.; Abstracts of Papers American Chemical Society, (1994) Vol. 207, No. 1-2, pp. BTEC 89.; Meeting Info.: 207th National Meeting of the American Chemical Society San Diego, California, USA March 13-17, 1994; ISSN: 0065-7727.
- Purification of fermentation products with polymeric media; Cartier, P. G.; Maikner, J. (1); Deissler, K. C.; Firouztale, E. Abstracts of Papers American Chemical Society, (1993) Vol. 205, No. 1-2,pp. BIOT 18.; Meeting Info.: 205th ACS (American Chemical Society) National Meeting Denver, Colorado, USA March 28-April 2, 1993 ISSN: 0065-7727.
- Process Economics Aspects of RPC Purification; Kinzey, M.; Kraus, M.; Fisher, J.; Maikner, J.; Rosen, R.; Recovery of Biological Products IX; May 23-28, 1999; Whistler, CA.
- Process Development and Scale up Using Polymeric RPC Resins; Kinzey, M.; Fisher, J.; O'Donnell, J.K.; Rosen, R.E.; Maikner. J.J.; Kraus, M/M., Iuliano, S.J.; Prep 98; May 31- June 3, 1998, Washington, DC.
- Strategies for Optimizing Peptide Purifications Using Amberchrom CG300S; Kinzey, M.; Deissler, K.; Fisher, J.; Maikner, J.; Kraus, M.; Rosen, R.; European Forum on Advances in Industrial Downstream Processing; May 13-15, 1998, Stuttgart, Germany.
- Process Economics Aspects of RPC Purification; Kinzey, M.; Kraus, M.; Fisher, J.; Maikner, J.; Rosen, R.; 3rd HIC/RPC Bioseparations Conference; February 5-9, 2001; Athens, Greece.

Ordering Information

Part Number	Description	Particle Size	Packaging
10235555	AMBERCHROM CG161S	35 µm	25 mL
10235556	AMBERCHROM CG161S	35 µm	100 mL
10235557	AMBERCHROM CG161S	35 µm	1000 mL
10097833	AMBERCHROM CG161S	35 µm	5 L
10097832	AMBERCHROM CG161S	35 µm	50 L
10235558	AMBERCHROM CG161M	75 µm	25 mL
10235559	AMBERCHROM CG161M	75 µm	100 mL
10235560	AMBERCHROM CG161M	75 µm	1000 mL
10097837	AMBERCHROM CG161M	75 µm	5 L
10097836	AMBERCHROM CG161M	75 µm	50 L
10235561	AMBERCHROM CG161C	120 µm	25 mL
10235562	AMBERCHROM CG161C	120 µm	100 mL
10235563	AMBERCHROM CG161C	120 µm	1000 mL
10097840	AMBERCHROM CG161C	120 µm	5 L
10051174	AMBERCHROM CG161C	120 µm	50 L

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