

CHROMATOGRAPHY

Macro-Prep® High Q Support

- Superior endotoxin binding capacity
- Excellent dynamic binding capacity at high flow rates

Achieve High Productivity Using Macro-Prep High Q Anion Exchange Support

Summary

Ion exchange chromatography is one of the most widely used techniques for protein purification. Macro-Prep High Q support is a strong anion exchanger containing quaternary amine functional groups and is ideal for purifying acidic and neutral proteins and peptides.

Macro-Prep High Q support is an excellent choice for rapid purification. This methacrylate copolymer bead provides high-resolution separations at very high flow rates (Figure 1). Changes in pH or ionic strength of the buffer do not cause shrinking or swelling of the support. The superior mechanical and chemical stability of Macro-Prep High Q support make it a preferred choice over other Q supports on the market.

Properties of Macro-Prep High Q Support

Type of support	Strong anion exchanger
Functional group	$-\text{N}^+(\text{CH}_3)_3$
Typical dynamic binding capacity	≥ 37 BSA/ml
Nominal particle size	50 μm
Nominal pore diameter	1,000 \AA
Recommended maximum linear flow rate	3,000 cm/hr
pH stability	1–10
Regeneration	in 1–2 M NaCl/KCl or 70% ethanol

Chemical Compatibility of Macro-Prep High Q Support

1% SDS	Yes
8 M guanidine-HCl	Yes
1 N HCl	Yes
100% ethanol	Yes

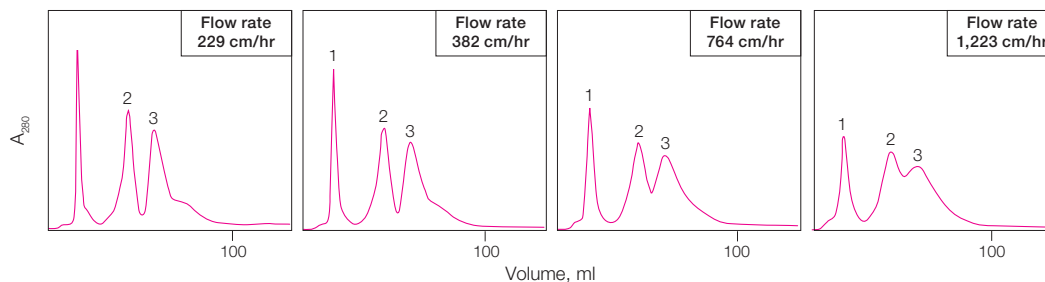


Fig. 1. Effect of flow rate on peak symmetry and separation. A 5 ml sample (4.4 mg/ml) of myoglobin (peak 1), ovalbumin (peak 2), and BSA (peak 3) was run on a 1 x 13 cm (8.7 ml) column at each of the indicated flow rates. The buffer was 50 mM Tris-HCl, pH 8.6, with a gradient of 0–0.5 M NaCl over 100 ml.



The dynamic binding capacity of Macro-Prep High Q media is affected very little by the linear flow rate, as shown in Figure 2. Binding capacity was determined by applying a solution of a protein sample through the column until the OD of the eluent was 50% that of the initial sample.

Chemical Stability

Macro-Prep High Q ion exchange media is stable in most aqueous solutions commonly used in purification of biomolecules. Macro-Prep media will withstand treatment in solutions of acid, detergents, chaotropic agents, and pH <10 while retaining full functional performance. Routine cleaning or operation of Macro-Prep High Q media above pH 10 is not recommended. Macro-Prep ion exchange media should not be sanitized or stored in NaOH.

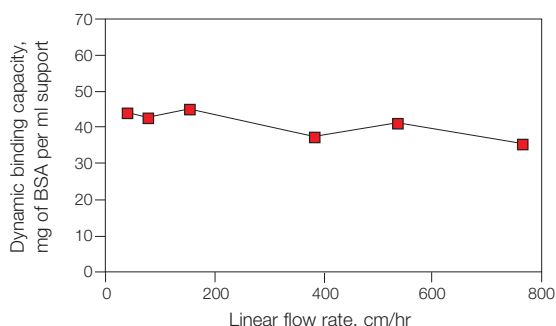


Fig. 2. Dynamic protein binding capacity as a function of linear flow rate. A 100 ml sample (3 mg/ml) of BSA was run on a 1 x 10 cm (8.0 ml) column at the indicated flow rates. The buffer was 50 mM Tris-HCl, pH 8.3. Elution was with 1.0 M NaCl.

Recommended Procedure

Macro-Prep High Q support is easy to use. Rinse the support with 2–3 bed volumes of distilled water and equilibrate in running buffer. Samples are loaded in low-salt buffer, such as 20–50 mM Tris, at a pH that is at least 1 pH unit above the isoelectric point of the protein of interest. Proteins can be eluted with an increasing salt (0–1 M NaCl or KCl) or decreasing pH gradient. Elution is followed by cleaning and regeneration steps of choice. For more detailed information, refer to the instruction manual.

Technical Assistance

Macro-Prep High Q ion exchange products have manufacturing processes registered with the United States Food and Drug Administration (FDA) by submission of Type II Drug Master Files (DMF). Regulatory support files are available upon request to companies entering into clinical trials. Bio-Rad Laboratories is an ISO 9001 registered corporation. For additional information and technical assistance, contact your local Bio-Rad office. In the USA and Canada, call 1(800)-4BIORAD.

Visit us on the Web for more information on Bio-Rad's complete line of process chromatography supports and other products for life science research and production. Go to www.bio-rad.com and click on the Process Separations tab on the top menu bar.

Ordering Information

Catalog #	Description
158-0040	Macro-Prep High Q Support, 25 ml
156-0040	Macro-Prep High Q Support, 100 ml
156-0041	Macro-Prep High Q Support, 500 ml
156-0042	Macro-Prep High Q Support, 5 L
156-0043	Macro-Prep High Q Support, 10 L

Larger volumes are available on request.



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