GPQ-60 (1000) Strong Anion Exchange Chromatography Resin Product Manual

1. Product Introduction

Ion exchange chromatography is the most commonly used method for the separation and purification of biological macromolecules. The GPQ-60 strong anion exchange medium developed by Bogen uses polymethacrylate microspheres with a rigid structure as the matrix, and unique surface modification technology to greatly improve the hydrophilicity of the polymer matrix. This resin features advantages of high resolution and low non-specific absorption, and excellent biocompatibility.

2. Product Properties

Parameter	Technical Specification
Particle size range	70±20 μm
Pore size	1000 nm
Pressure upper limit	1MPa
Matrix beads	Polymethacrylate
Function group	Quaternary amino group ($-CH_2N^+(CH_3)_3$)
Function group type	Strong base
Pressure upper limit	≥10mg BSA/ml wet gel
pH stability	Resistant to 0.5 M NaOH solution cleaning
Storage	4-30 ℃ (20% ethanol)

3. Operation Steps

GPQ-60 strong anion exchange resin is used for the separation and purification of plasmids and viruses. Chromatography operations usually include steps such as equilibration, loading, washing, elution, and regeneration. Detailed operation methods are as follows:

Equilibration: Use 5 - 10 CVs equilibration buffer (Buffer A, such as 20 mM PB, pH 8.0, the actual buffer system used should be screened and optimized based on the stability and isoelectric point of the target protein) to equilibrate the column until the conductivity and pH of the effluent remain stable (consistent with the equilibration solution).

Loading: The buffer of sample should be as consistent as possible with the equilibration solution. Solid samples can be prepared by dissolving in the equilibration solution; low-concentration sample solutions can be dialyzed with the equilibration solution or add a corresponding amount of salt; high-concentration sample solutions can be diluted with the equilibration solution. To avoid clogging the chromatography column, the sample solution should be centrifuged or micro-filtrated (0.45 μm). The loading amount is calculated based on the loading capacity of the resin and the content of the target protein in the feed.

Washing: After loading the sample, continue to wash with equilibration buffer until the UV value drops to the baseline.

Elution: Elute with elution buffer (such as 20 mM PB + 1 M NaCl, pH 7.0, or use pH gradient elution, linear gradient elution or step gradient elution), and collect the effluent.

Regeneration: The column can be washed with 1-2 M NaCl after each campaign to remove strongly bound proteins.

Cleaning in place: After the resin has been used 5-10 times (the actual number of uses is related to the type and source of feed materials and process requirements), the resin needs to be cleaned in place:

(1) For proteins that are strongly bound by ionic bonds, clean with 2 M NaCl for 10 - 15 min;
(2) For precipitated proteins, hydrophobically bound proteins, and lipoproteins, clean with 3-4 CVs of 1 M NaOH;
(3) For strongly hydrophobically bound proteins, lipoproteins and lipids, clean with 3-4 CVs of 70% ethanol or 30% isopropyl alcohol at a flow rate not higher than the upper pressure limit (when using high-concentration organic solvents, to avoid bubbles, a method of gradually increasing the concentration of organic solvent should be used).

Storage: Store in 20% ethanol at 4-30°C; the resin in the chromatography column can be washed with 20% ethanol and stored at 4-30°C.

Other precautions: During operating and storing the column, avoid the column from drying out or being loosely sealed to prevent air bubbles from entering.

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