HPDEAE-60 Weak Anion Exchange Chromatography Resin Product Manual

1. Product Introduction

Ion exchange chromatography is the most used method for the separation and purification of biomacromolecules. HPDEAE-60 weak anion exchange chromatography resin developed by Bogen is based on polymethacrylate microspheres with rigid structure as matrix. The hydrophilicity of the polymer matrix is greatly improved by special surface modification technology, which features the advantages of high resolution, low non-specific adsorption and excellent biocompatibility. The designed pore size is suitable for the purification of most antibodies and recombinant proteins except peptides and viruses.

2. Product Properties

Parameter	Technical Specification
Particle size range	70±20 μm
Pore size	30 nm
Matrix beads	Polymethacrylate
Function group	DEAE (-$(CH_2)_2N(C_2H_5)_2$)
Function group type	Weak base
Dynamic binding capacity	≥20 mg BSA/ml wet gel
Pressure upper limit	1 MPa
pH stability	3-13 (long-term); 2-14 (short term)
Storage	4-30 ℃ (20% ethanol)

3. Operation Steps

HPDEAE-60 weak anion exchange resin is widely used for chromatographic separation of recombinant proteins, blood products, enzymes, polysaccharides, nucleic acids. Chromatography operations usually include steps of equilibration, loading, washing, elution, regeneration.

Equilibration: equilibrate the ion exchange column with an equilibration buffer of 5 – 10 CVs (e.g. 20 mM PB, pH7.0, the actual buffer used should be screened and optimized according to the stability and isoelectric point of the target protein) at a flow rate not higher than the upper pressure limit until the conductivity and pH of effluent are 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). The elution method can be 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 3-4 CVs of 2 M NaCl;
(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, in order 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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