Product Data Sheet

BioFox™ IEX Mini-Cartridges, 40Q, 40S and 40DEAE

Catalog Number: 10222, 10223, 10224

AthenaES®
a division of Athena Environmental Sciences, Inc.

Athena Enzyme Systems™
1450 South Rolling Road
Baltimore, MD 21227
USA

T (MD): 410-455-6319
T (USA): 888-892-8408
F: 410-455-1155
aesinfo@athenaes.com

Product Description

The BioFox™ IEX Mini-Cartridges are pre-packed 1 ml columns. The columns are packed with BioFox™ 40 µm Q, S or DEAE derivitized agarose beads. These beads are made using a proprietary cross-linking process that yields a highly porous, physically stable resin. The beads can withstand pressures up to 40 bar (580 psi). The high pressure tolerance coupled with a narrow particle size range allows for high resolution separations without loss of process time.

Principal of Ion Exchange Chromatography:

Ion exchange chromatography is the process of separating biomolecules based on their ionic state. For the target molecule to bind to a given resin, it must have a net charge. Therefore, the pH of the solution should be at least 1 pH unit above or below the pI of the molecule. In anion exchange chromatography the negatively charged molecule binds to positively charged resin whereas in cation exchange chromatography the positively charged molecule binds to negatively charged resin. For the separation of proteins, the practical pH range is 5.5 to 9.0. Bound molecules are desorbed from the resin by neutralzing the charge with increasing concentrations of counter ions, often NaCl or KCl.

Instructions for Use:

The BioFox™ IEX Mini-Cartridges are intended for small-scale separations and methods development and scouting. Before using the cartridge, remove the storage solution (20% ethanol) by flushing it with deionized water or low ionic strength buffer. Washing is best done at 1 ml/min for 15 min. When not in use, the cartridges should be stored in a solution of 20% ethanol. Sanitize with 0.5 N NaOH at a flow rate of 0.25 ml/min for 1 h.

Resin Preparation: Prior to the first chromatographic run or following storage, the resin should be washed and equibrated at the desired starting conditions. Prepare Buffer A ("Equilibration" or "Wash" Buffer is a low ionic strength 20-50 mM buffer at the desired pH) and Buffer B ("Elution" Buffer is Buffer A with 1 M salt). Wash the cartridge with 5 Column Volumes (5 ml) of Buffer A at a flow rate of 1 ml/min. Switch to Buffer B and wash for 5 CV (5 ml) at a flow rate of 1 ml/min. Equilibrate the resin in Buffer A by washing with 10 CV at 1 ml/min (10 ml). Suitable buffers and salts are listed in the table to the right.

Chromatographic Separation: The fractionation of a protein solution involves four phases. Ideally, before loading the protein solution onto the resin, the solution should be exchanged into Buffer A. This can be done by dialysis, gel filtration, ultrafiltration, diafiltration or dilution. Wash the column with Buffer A to establish a baseline absorbance at 280 nm. Load the sample at a flow of 0.25 to 2.5 ml/min (50-500 cm/h) until the absorbance at 280 nm returns to baseline. The optimum flow rate should be determined empirically, however, 1 ml/min is typical and a good starting point. Once the absorbance has returned to baseline, wash the resin with 5 CV (5 ml) of Buffer A. Elute the bound protein by applying increasing amounts of Buffer B. Initial separations should be done using a 10-20 CV (10-20 ml) linear gradient of 0-100% Buffer B (0-1 M salt). Continue washing with Buffer B for an addtional 5 CV (5 ml). Collect 0.5 to 1.0 CV fractions during the elution and high salt wash phase. Switch to Buffer A and wash the resin for 5 CV (5 ml).

Buffer Recommendations:

pH Range	Buffer
Anion Exchange	
8.5-9.0	Diethanolamine
7.5-8.5	Tris
6.5-7.5	Imidazole
5.5-6.5	Histidine
5.0-5.5	Pyridine
Cation Exchange	
7.5-8.5	Tricine
6.5-7.5	MOPS
5.5-6.5	MES
5.0-5.5	Acetic Acid
Adjust pH with HCl, NaOH or KOH. Use NaCl or KCl as the displacing ions.	

Specifications:

Resin Properties	Specification		
Particle Size (µm)	32-60		
Agarose Content	7.5-7.8%		
Ion Capacity (mmol/ml)	0.18-0.26		
Flow Rate (ml/min)	0.1-5.0		
pH Stability	1-14		
Solvent Resistance			
100% ethanol, 100% methanol, 6 M Guanidine HCl, 30% acetonitrile, 70% formic acid, 1 M NaOH, 0.1 M HCl, 5% SDS, 5% mercaptoethanol, 30% acetic acid, 0.1% trifluoroacetic acid			
	40Q	40S	40DEAE
Ion Group	Quaternary Amine	Sulfonic Acid	Diethylami-noethyl
Protein Capacity	130 mg/ml BSA	70 mg/ml BSA	85 mg/ml BSA

Material Safety Data

FOR RESEARCH USE ONLY. NOT INTENDED OR APPROVED FOR HUMAN, DIAGNOSTICS OR VETERINARY USE. Do not ingest, swallow or inhale. Do not get in eyes, on skin, or on clothing. Wash thoroughly after handling. For complete safety information see full Material Safety Data Sheet.