Non-Porous High Speed Columns

The high-speed ion exchange columns are designed for high throughput of quality control, process monitoring and
other applications, which need rapid scanning of complex samples.

After biocompatible coating, the highly rigid non-porous polystyrenedivinylbenzene (PS-DVB) beads have unique mass transfer characteristics for ultra high-speed chromatography. The Major Advantages of Hydrocell Non-Porous Speed

The Major Advantages of HYDROCELL Non-Porous High Speed Columns are:

- High Speed Throughput Separation
- Higher Sensitivity
- Better Resolution & Efficiency
- Significantly Less Mobile Phase Consumption

Ion Exchange:

HYDROCELL high speed non-porous ion exchange media DEAE NP10, QA NP10, CM NP10, and SP NP10 are prepared from 10 µm non-porous PS-DVB polymeric beads with hydrophilic coating following by immobilizing diethylaminoethyl (DEAE), diethylmethylaminoethyl (QA), carboxymethyl(CM), and sulfopropyl (SP) bonded phases, respectively.

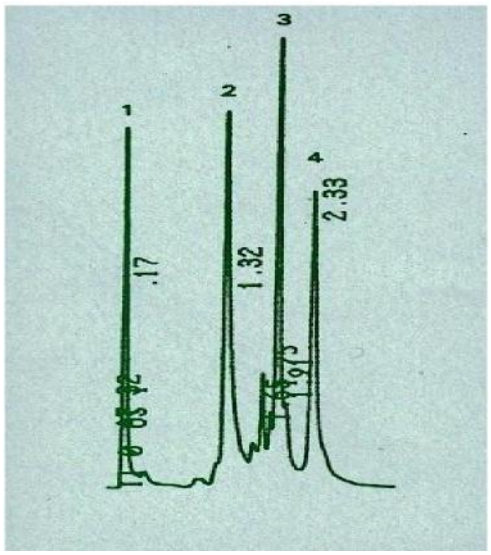
Hydrophobic Interaction:

Similarly, HYDROCELL high speed non-porous hydrophobic interaction media C3 NP10, C4 NP10 and Phenyl NP10 are prepared from 10 µm non-porous PS-DVB polymeric beads with hydrophilic coating following by immobilizing allyl (C3), butyl (C4) and phenyl (PH) bonded phases, respectively.

Both types of non-porous media are compatible with aqueous solutions in the pH range of 1 to 14 and with most polar organic solvents. High-resolution separation of proteins and enzymes can be achieved at high flow rates with steep gradient within a few minutes.

Hydrocell DEAE NP10

Protein Mixture



Column: 35 x 4.6 mm
Mobile Phase:
A: 10 mM Tris, pH 8.0
B: Eluent A + 0.5 M NaCl, pH 8.0
Gradient: Linear 0-50% B in 5 minutes
Detection: UV 280 nm
Flow Rate: 2.0 mL/min
Injection: 10 µL
Peak Identification:

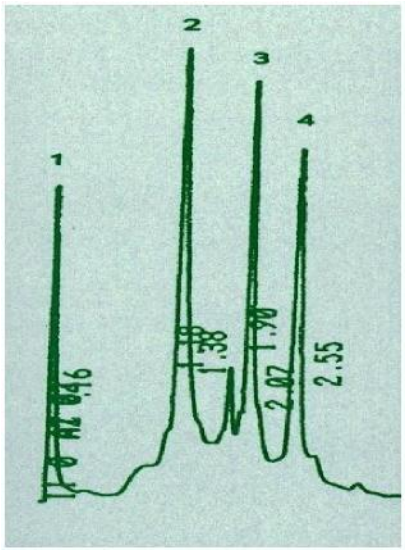
1. Myoglobin
2. Conalbumin
3. Ovalbumin
4. Soybean Trypsin Inhibitor

Hydrocell QA NP10

Protein Mixture

Column: 35 x 4.6 mm
Mobile Phase:
A: 10 mM Tris, pH 8.0
B: Eluent A + 0.5 M NaCl, pH 8.0
Gradient: Linear 0-50% B in 5 minutes
Detection: UV 280 nm
Flow Rate: 2.0 mL/min
Injection: 10 µL
Peak Identification:

1. Myoglobin
2. Conalbumin
3. Ovalbumin
4. Soybean Trypsin Inhibitor

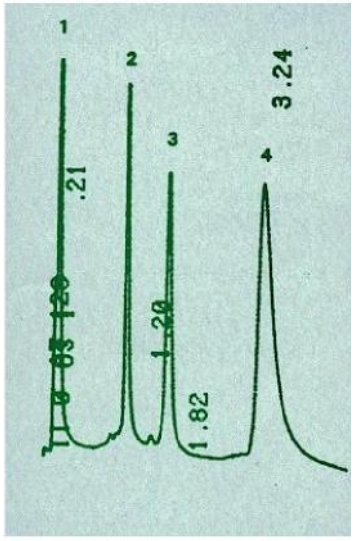


Hydrocell SP NP10

Protein Mixture

Column: 35 x 4.6 mm
Mobile Phase:
A: 20 mM Potassium Phosphate, pH 6.0
B: Eluent A + 0.5 M NaCl, pH 6.0
Gradient:
Linear 0-100% B in 5 minutes
Detection: UV 280 nm
Flow Rate: 2.0 mL/min
Injection: 10 µL
Peak Identification:

1. Myoglobin
2. Trysinogen 3, Chymotrysinogen A
4. Lysozyme

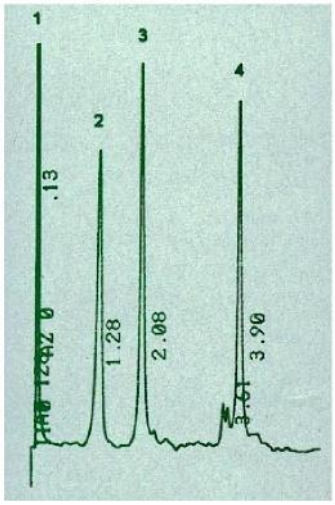


Hydrocell C4 NP10

Protein Mixture

Column: 35 x 4.6 mm
Mobile Phase:
A: 2.5 M Ammonium Sulfate in Eluent B
B: 0.1 M Potassium Phosphate, pH 7.0
Gradient: Linear 0-100% B in 5 minutes
Detection: UV 280 nm
Flow Rate: 2.0 mL/min
Injection: 10 µL
Peak Identification:

1. Cytochrome C
2. Ribonuclease A
3. Lysozyme
4. Chymotrysinogen A

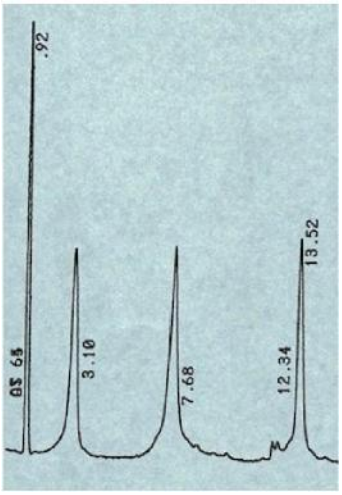


Hydrocell Phenyl NP10

Protein Mixture

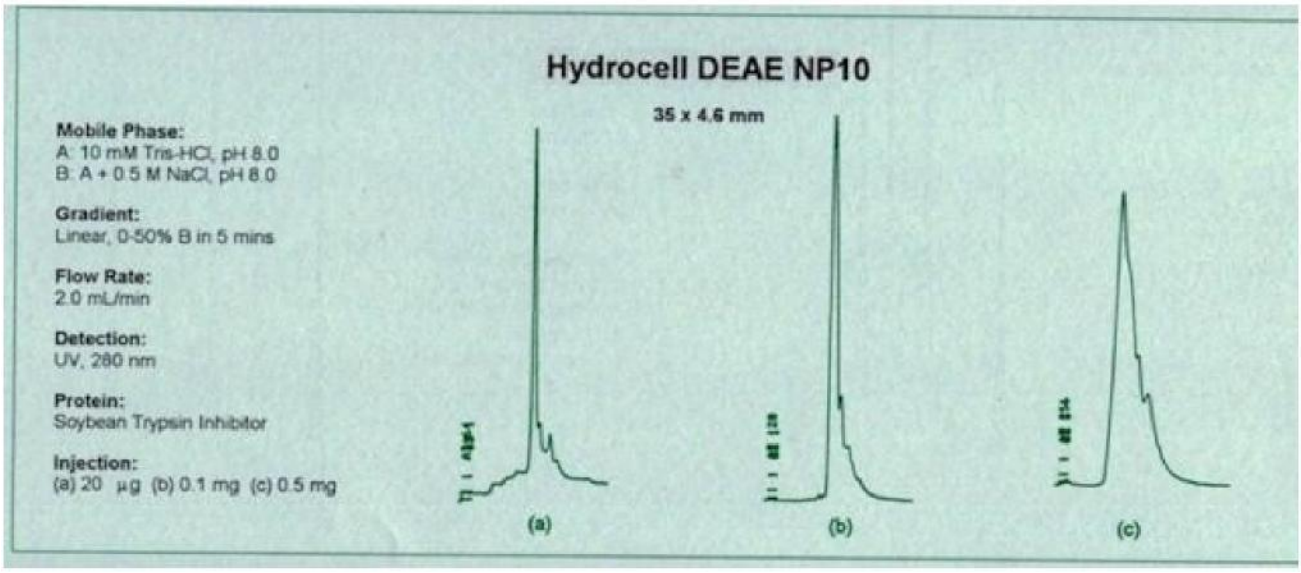
Column: 150 x 4.6 mm
Mobile Phase:
A: 2.5 M Ammonium Sulfate in Eluent B
B: 0.1 M Potassium Phosphate, pH 7.0
Gradient:
Linear 0-100% B in 20 minutes
Detection: UV 280 nm
Flow Rate: 1.0 mL/min.
Injection: 20 µL
Peak Identification:

1. Ribonuclease A
2. Lysozyme
3. Chymotrysinogen A



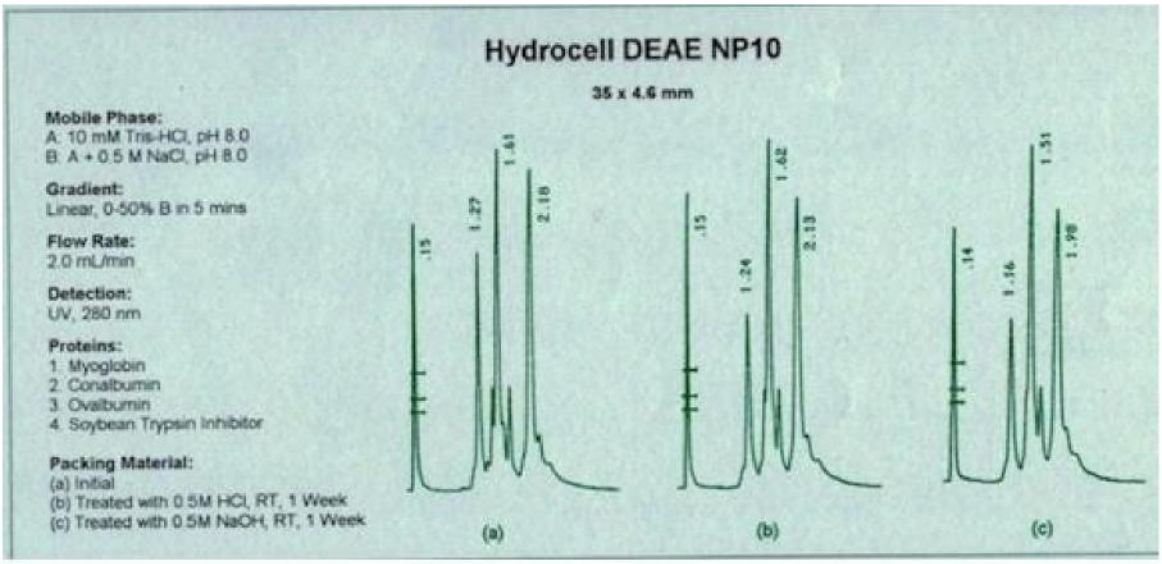
Loading Capacity

The loading capacity of HYDROCELL NP10 is comparable to many of the porous media available. The dynamic protein loading capacity determined by Frontal Uptake procedure are about 35 mg of ovalbumin, 25 mg of lysozyme and 15 mg of lysozyme per mL of column volume on DEAE NP10, SP NP10 and C3 NP10 columns, respectively. The practical loading capacity is ca. 0.1- 0.2 mg of protein on a 35 x 4.6 mm column.



Chemical Stability

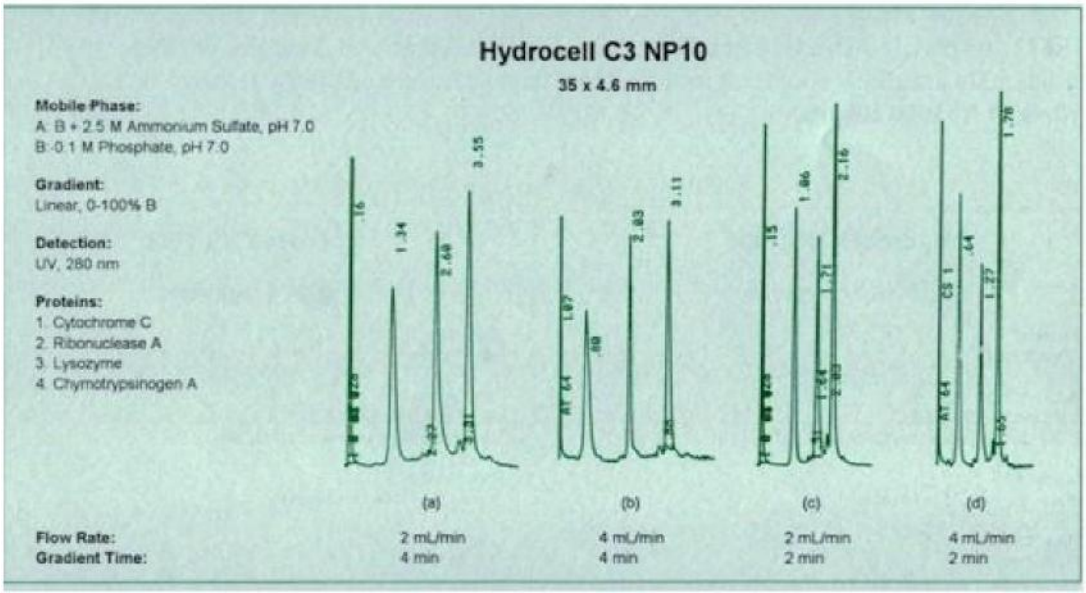
The HYDROCELL NP10 media do not have any ester or amide linkages as do the other commercial products. Their chemical stability allow fast clean up with strong acids (e.g., 0.5M HCl) or bases (e.g., 0.5M NaOH). As shown in the following chromatograms the resolutions among four standard proteins did not show any significant changes when the initial packing material (a) of HYDROCELL DEAE NP10 was treated with 0.5M HCl solution (b) or 0.5M NaOH solution (c) at room temperature for one week.



Protein Retention Time

HYDROCELL NP10 media do not readily change their physical dimensions under high flow rate or under steep gradient applications. The analysis of proteins and enzymes can be conducted with short run times by either increasing the gradient slope or increasing the flow rate. However, the flow rate does not contribute to the shortness of the analysis time as much as the gradient slope does, especially for high retention macromolecules. The high speed, high resolution separation can be achieved at a moderate flow rate with high gradient slope on a HYDROCELL NP10 column to reduce the solvent consumption.

As shown in the following chromatogram, an increase in flow rate at the same gradient time (a & b, or c & d) sharpens peaks and slightly decreases run time, while a decrease in gradient time at the same flow rate (a & c or b & d) dramatically reduces run time.



Non-Porous Anion Exchangers

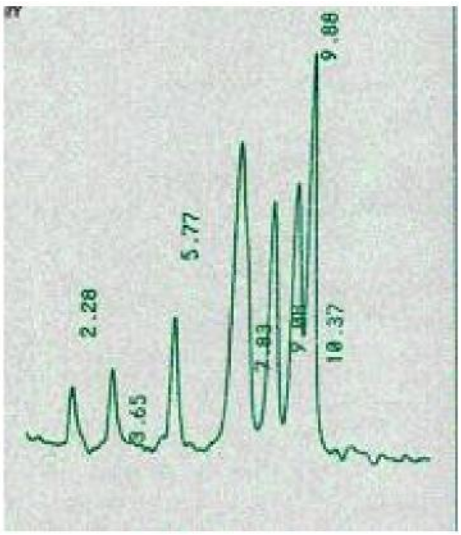
In addition to their use in process monitoring and quality control analysis of proteins and enzymes, the highly efficient DEAE NP10 and QA NP10 high-speed columns are also suitable for the analysis of small nucleotides, oligonucleotides, and DNA fragments. High loading capacity and low back pressure are the unique characteristics of these columns. These characteristics allow the easy scale-up from analytical to preparative separations. The sensitivity of non-porous anion exchangers is better and retention time is shorter than NS 1500. It is recommended for the trace analysis and rapid scanning of complex samples.

Scroll down for Chromatograms.

Hydrocell DEAE NP10

DNA Fragments

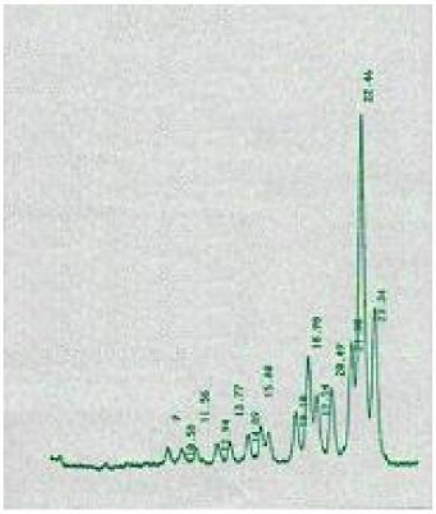
Column: 35 x 4.6 mm
Mobile Phase:
A: 2 M Urea, 20 mM Potassium Phosphate, pH 5.5
B: Eluent A + 1.0 M Ammonium Sulfate, pH 5.5
Gradient:
Linear 40-70% B in 15 minutes
Flow Rate: 1.0 mL/min.
Detection: UV 280 nm
Sample: pUC18 DNA Hae III Digest
Injection: 10 µL



Hydrocell DEAE NP10

DNA Fragments

Column: 35 x 4.6 mm
Mobile Phase:
A: 2 M Urea, 10 mM Potassium Phosphate, pH 5.5
B: Eluent A + 0.5 M Ammonium Sulfate, pH 5.5
Gradient:
Linear 40-100% B in 30 minutes
Flow Rate: 1.0 mL/min
Detection: UV 280 nm
Sample: pBR322 DNA Hae III Digest
Injection: 10 µL



Hydrocell QA NP10

Oligonucleotides

Column: 150 x 4.6 mm
Mobile Phase:
A: 25 mM CHES, pH 8.0
B: Eluent A + 1.2 M Ammonium Sulfate, pH 8.0
Gradient:
Linear 10-50% B in 40 minutes
Flow Rate: 1.0 mL/min.
Detection: UV 260 nm
Sample: Oligothymidylic Acid d(pT) 12-18 mer, 5 units in 1 mL of eluent A
Injection: 10 µL