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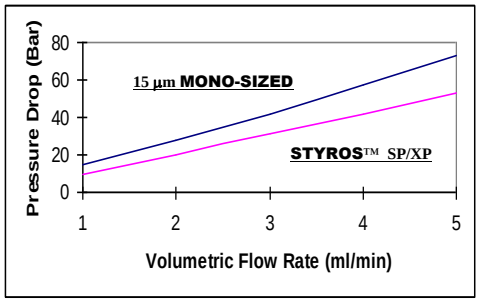
APPLICATION NOTE

Polymeric Gigaporous Strong Cation Exchangers: Effect of Capacity on Protein Resolution.

The media capacity is often overlooked in the analytical processes as it requires higher salt concentration to elute the proteins.
If however the same analytical process was considered as a first step towards the scale up where high capacity is the major component of throughput, one might reconsider the use of higher salt concentration and accomplish a far more efficient separation even for analytical purposes.
STYROS™ SP/XP, a high capacity cation exchanger (100 mg/ml Lysozyme) is compared with a mono-sized 15 μm stationary phase with similar functionality but half the capacity.
The flow/pressure drop of the two columns is depicted in the following chart:

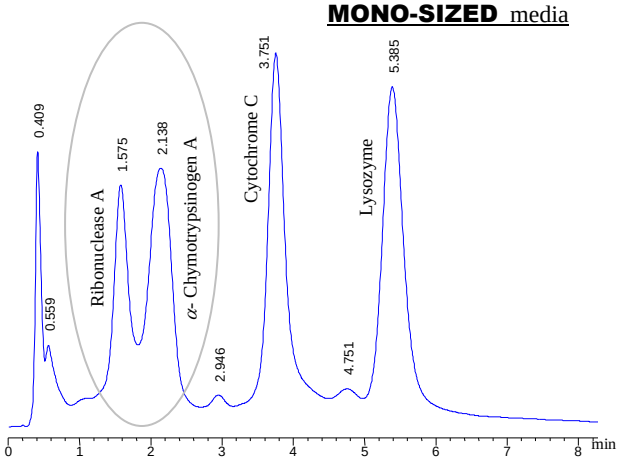


The following table summarizes the conditions for the two columns:

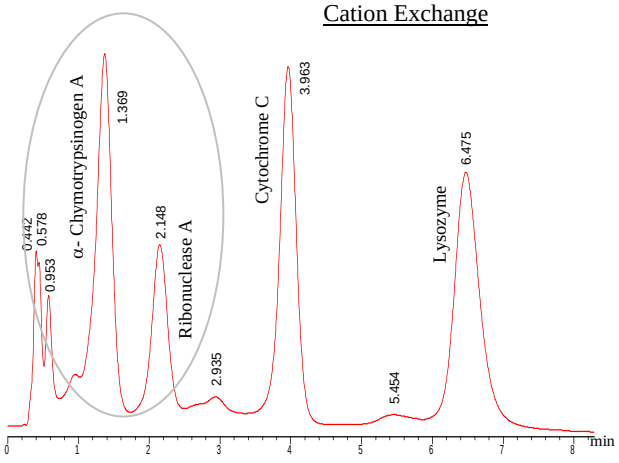
Table 1. Operating Parameters.

HPLC System.	HP 1100
Columns	**STYROS**™ SP/XP 100x4.6mm and **15 μm MONO-SIZED** media 100X4.6 mm
Mobile Phase	A: 20 mM Phosphate, pH = 7 B: A + 1 M NaCl, pH = 7
Flow rate	3 ml/min (1,080 cm/hr)
Gradient	**STYROS**™ : 15 to 50 % B in 15 cv, **MONO-SIZED** : 5 to 35 % B in 15 cv.
Temperature	30°C
Detection	280 nm
Injection volume	5 μl
Samples	α-Chymotrypsinogen A, Ribonuclease A, Cytochrome C, Lysozyme.

15 μm Cation Exchange
MONO-SIZED media



STYROS™ SP/XP
Cation Exchange



The higher binding capacity of **STYROS**™ SP/XP (nearly twice) allows the baseline separation of all the proteins in the sample.

Among the advantages of hard gel fully pervious media with uniform pore size, is to provide high capacity stationary phases leading to higher resolutions. without increasing the column pressure drop.
Other factors to be considered are, protein recovery, carry-over between runs, absence of leaching during use, column lifetime, and stability to a wide range of pH and chemical cleaning agents.