Sample Name:
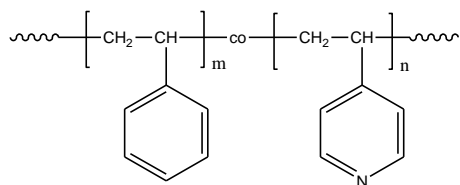 **Random Copolymer Poly(styrene-co-4-vinypyridine)**
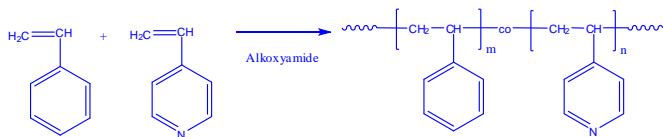
Sample #: P6424-S4VPran

Structure:

Composition:

P4VP (mol%) : 90.2

Mn x 10³ PS-co-P4VP	PDI
141.5	1.66
T$_g$ for the random polymer	144°C

Synthesis Procedure:

The polymer is prepared by nitroxide mediated radical polymerization of styrene and 4-vinylpyridine. The scheme of the reaction is illustrated below:
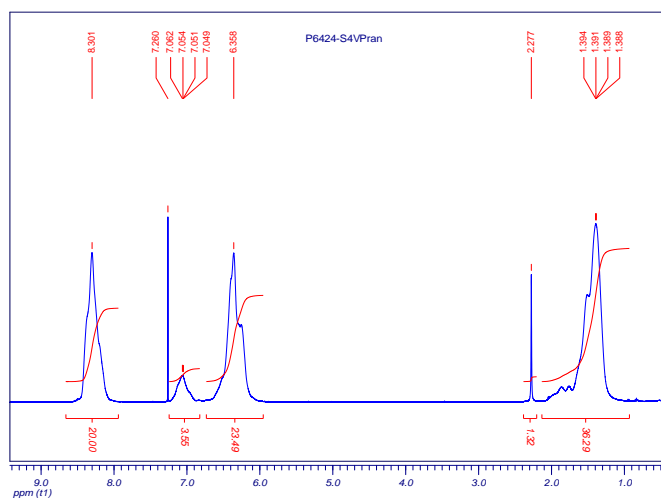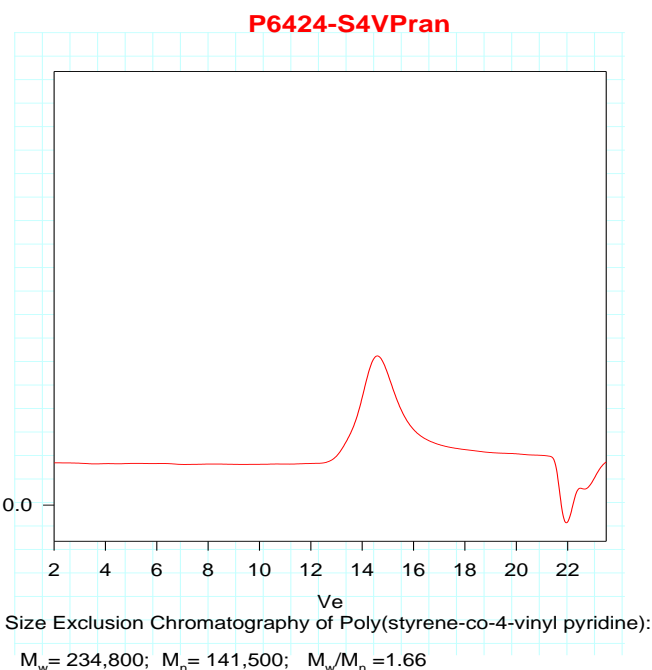

Characterization:

The polymer was analyzed by size exclusion chromatography (SEC) in DMF to obtain the molecular weight and polydispersity index (PDI). The copolymer composition was calculated from ^{1}H-NMR spectroscopy by comparing the peak area of 4VP protons at 8.28 ppm with the styrene protons at about 6.1-7.2 ppm that deducts the contribution of the 4VP protons.

Thermal analysis:

Thermal analysis of the samples was carried out on a TA Q100 differential scanning calorimeter at a heating rate of 10°C/min. The midpoint of the slope change of the heat flow plot of the second heating scan was considered as the glass transition temperature (T$_g$).

Solubility:
The copolymer is soluble in CHCl$_3$, DMF, and precipitated out from hexane, ether even THF in this composition (10% of styrene).

^{1}H-NMR Spectrum of the random copolymer:

SEC of the random copolymer:

Size Exclusion Chromatography of Poly(styrene-co-4-vinyl pyridine):

M$_w$= 234,800; M$_n$= 141,500;   M$_w$/M$_n$ =1.66

DSC thermogram for the sample: