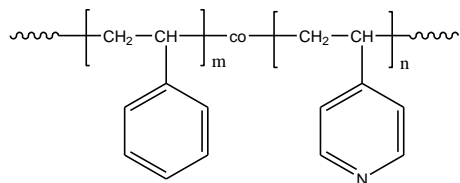## Sample Name:
 Random Copolymer Poly(styrene-co-4-vinypyridine)

Sample #: P7302-S4VPran

Structure:

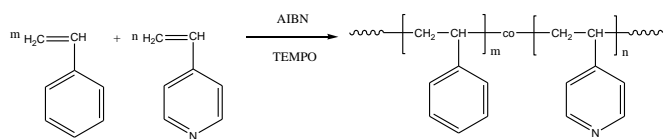

Composition:
P4VP (mol%) : 35

Mn x 10^3 PS-co-P4VP	PDI
93.9	1.5
T_g for random polymer	119°C

Synthesis Procedure:
The polymer is prepared by radical polymerization of styrene and 4-vinylpyridine in the presence of TEMPO. The scheme of the reaction is illustrated below:

Characterization:
The polymer was analyzed by size exclusion chromatography (SEC) 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.
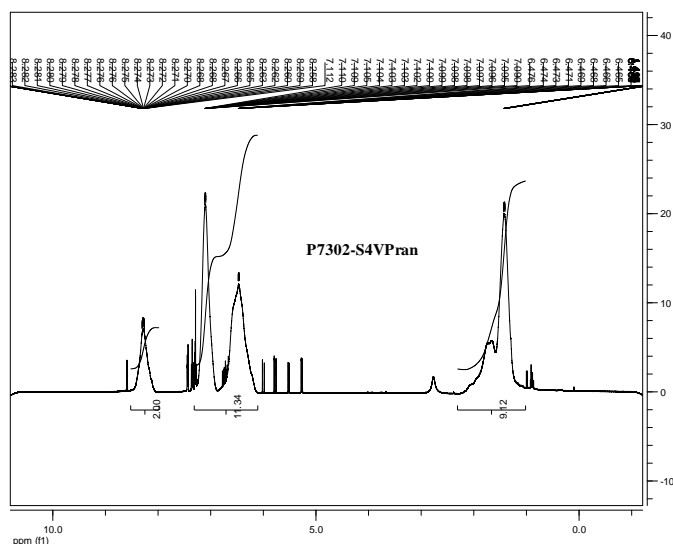
Thermal analysis:

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).
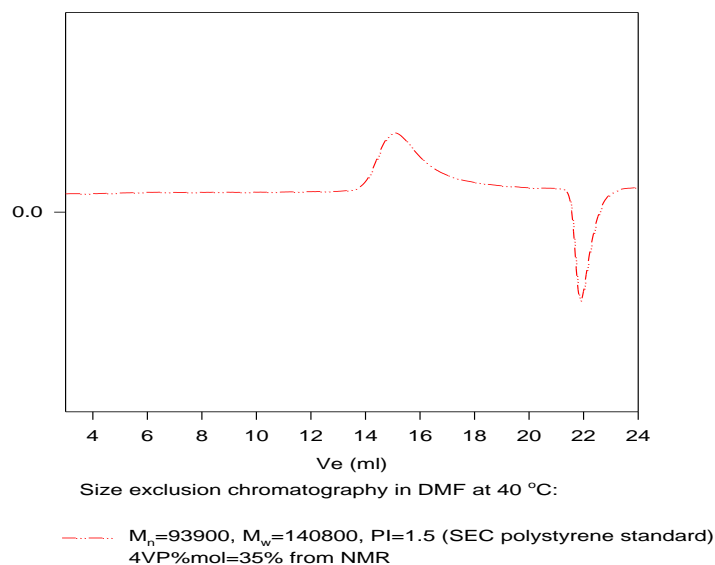
Solubility:
The polymer is soluble in CHCl$_3$, THF, DMF, toluene and precipitated out from hexane

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

SEC of the random copolymer:

P7302-S4VPran

Size exclusion chromatography in DMF at 40 °C:

—·—·— M$_n$=93900, M$_w$=140800, PI=1.5 (SEC polystyrene standard)
4VP%mol=35% from NMR

DSC thermogram for the sample: