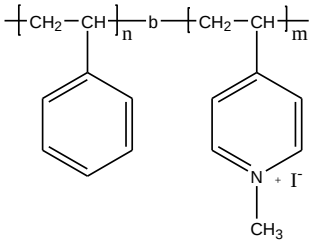
Sample Name: **Poly(styrene-b- N-methyl 4-vinyl pyridine iodide)**
Sample #: **P6307-S4VPQ**

Structure:

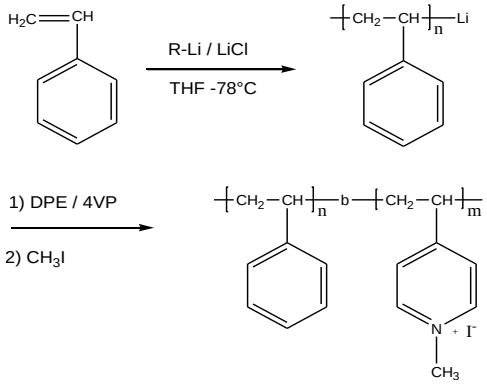


Composition:

Mn ×10^3 PS-b-P4VPQ	PDI
40.0-b-13.0	1.10
T_g for PS block: 106°C	T_g for 4VPQ block: Not found

Synthesis Procedure:

Poly(styrene -b- 4-vinyl pyridinium iodide) is prepared by living anionic polymerization with sequence addition of styrene followed by 4-vinyl pyridine and quaternization by the polymer using methyl iodide. The reaction scheme is shown below:



Characterization:

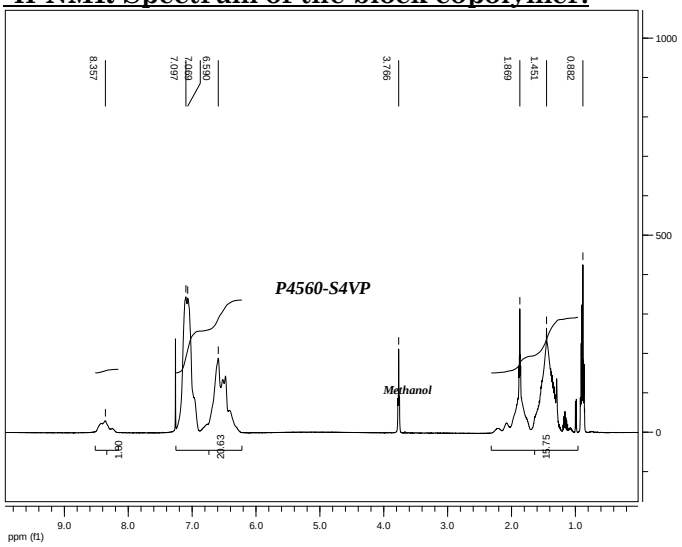
An aliquot of the polystyrene block was terminated before addition of 4-vinyl pyridine and analyzed by size exclusion chromatography (SEC) to obtain the molecular weight and polydispersity index (PDI). The final block copolymer composition was calculated from ^{1}H-NMR spectroscopy by comparing the peak area of the styrene protons at 6.3-7.2 ppm with the peak area of the 4-vinyl pyridine protons at about 8.5 ppm. Block copolymer PDI is determined by SEC.

Quaternization. Polymer was dissolved in distilled DMF. Distilled methyl iodide was added 2 molar excess. The reaction mixture was stirred at 40°C overnight. The quaternized polymer was precipitated into hexane, filtered and washed with hexane several times. It was dried under vacuum for 8 h., the yield of the polymer indicating quantitative quaternization. The quaternization of the polymer was confirmed by the disappearance of the pyridine band at 1412 cm^{-1}.

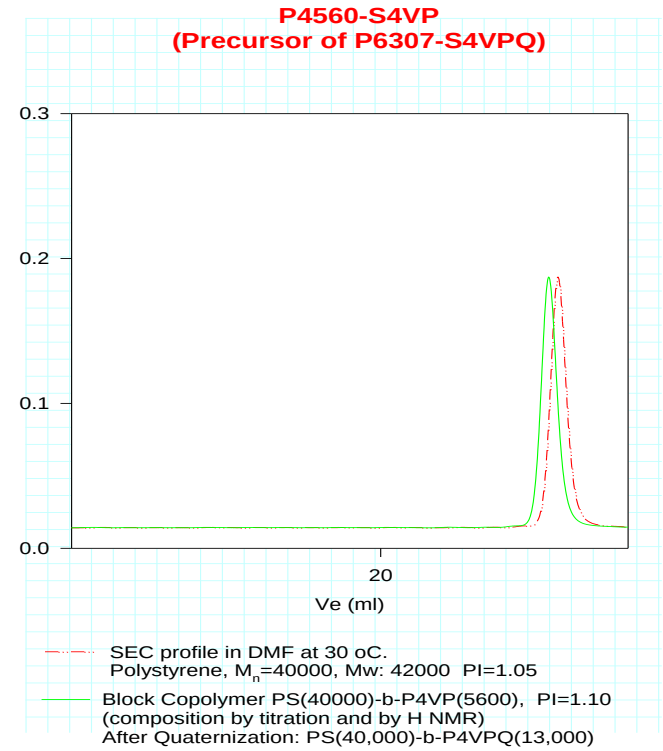
Solubility:

Poly(styrene -b- 4-vinyl pyridinium iodide) is soluble in DMF, NMP and DMSO dependent on the composition.

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



SEC of the block copolymer:



DSC thermogram for the polymer: