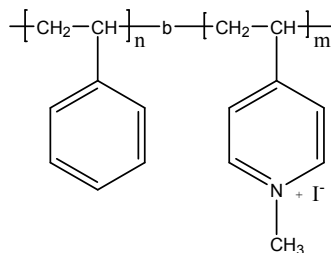


**Sample Name:** Poly(styrene-b- N-methyl 4-vinyl pyridine iodide)

**Sample #:** P5153-S4VPQ

**Structure:**

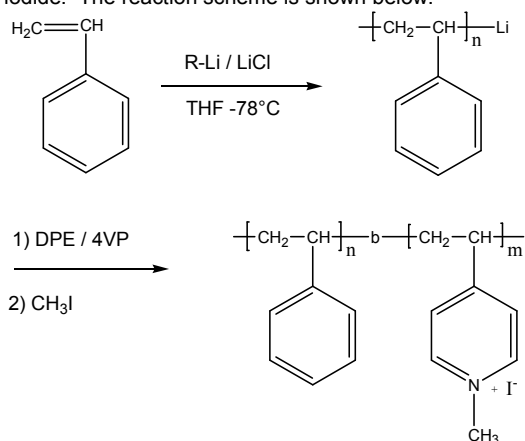


**Composition:**

Mn x 10 <sup>3</sup> PS-b-P4VPQ	PDI
422.0-b-159.0	1.09

**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:**

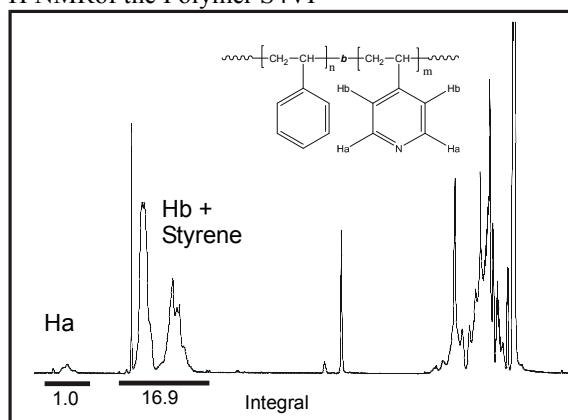
An aliquot of the polystyrene block was terminated before addition of 4-vinyl pyridine and analyzed by size exclusion chromatography (SEC) to obtain the molecular weight and polydispersity index (PDI). The final block copolymer composition was calculated from <sup>1</sup>H-NMR spectroscopy by comparing 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. Fourier transform infrared spectroscopy was performed on a Nicolet Impact 400D. Polymer films were cast on KBr windows from chloroform solutions. 16 scans were taken at resolution of 4 cm<sup>-1</sup>. The quaternization is confirmed by the disappearance of the pyridine band at 1412cm<sup>-1</sup>.

**Solubility:**

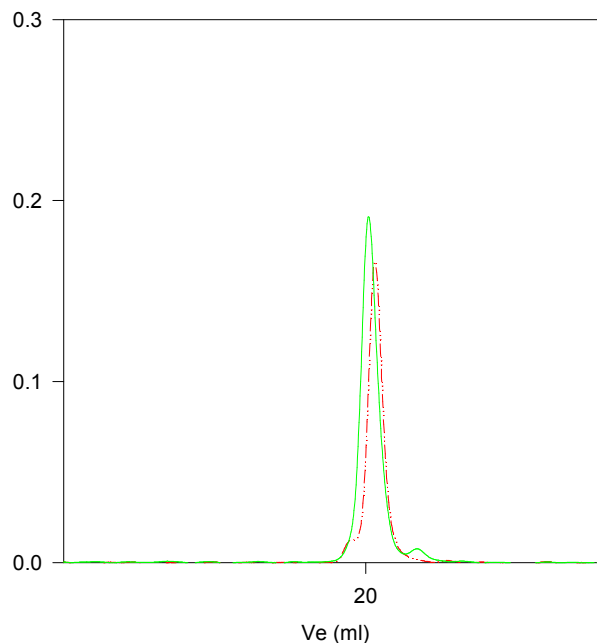
Poly(styrene -b- 4-vinyl pyridinium iodide) is soluble in DMF, NMP and DMSO dependent on the composition.

**<sup>1</sup>H NMR of the Polymer S4VP**



**SEC of the block copolymer:**

**P5153-S4VP Precursors for P5153-S4VPQ**



--- SEC profile in DMF at 30 °C.  
Polystyrene, M<sub>n</sub>=422000, M<sub>w</sub>=447000, PI=1.06  
— Block Copolymer PS(422000)-b-P4VP(68000), PI=1.09  
(composition by titration and by <sup>1</sup>H NMR)  
After Quaternization with CH<sub>3</sub>I: Mn: 422000-b-159000

