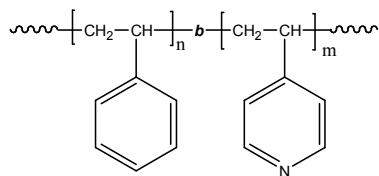


Sample Name: Poly(styrene-b-4-vinyl pyridine)

Sample #: P9007-S4VP

**Structure:**



**Composition:**

Mn x 10 <sup>3</sup> PS-b-4VP	PDI
47.0-b-10.0	1.10
T <sub>g</sub> for PS block: 105°C	T <sub>g</sub> for 4VP block: 133°C

**Synthesis Procedure:**

Poly(styrene-b-4-vinyl pyridine) is prepared by living anionic polymerization in THF or THF-DMF solvent mixtures at -78 °C. Polystyrene macroanions were end capped with a unit of diphenyl ethylene (DPE) before adding 4-vinylpyridine (4VP) monomer. For further details please see our published articles.<sup>1,2</sup>

**Characterization:**

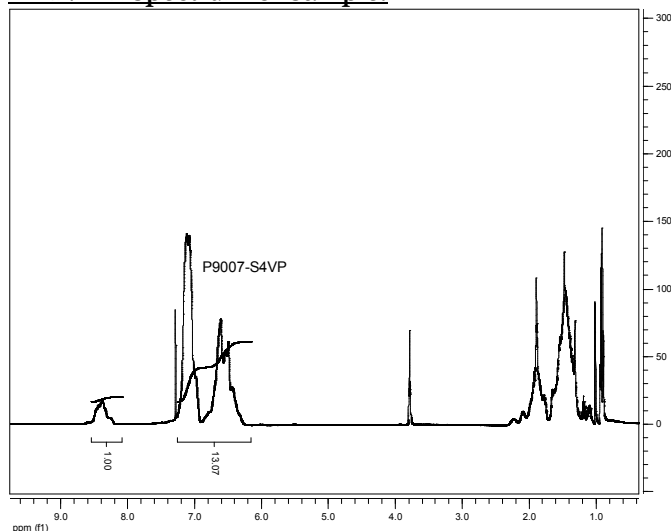
An aliquot of the anionic polystyrene block was terminated before addition of 4-vinyl pyridine and analyzed by size exclusion chromatography (SEC) in DMF to obtain the molecular weight and polydispersity index (PDI). The block copolymer composition was then calculated from <sup>1</sup>H-NMR spectroscopy by comparing the peak area of the two aromatic 4-VP protons at about 8.5 ppm with the peak area of the aromatic protons of polystyrene at 6.3-7.2 ppm. The composition of the block copolymer can also be determined by titration in acetic acid/HClO<sub>4</sub> using crystal violet indicator. Copolymer PDI is determined by SEC.

Thermal analysis of the samples was carried out using a differential scanning calorimeter (TA Q100) at a heating rate of 15°C/min. The inflection glass transition temperature (T<sub>g</sub>) of the sample has been considered.

**Solubility:**

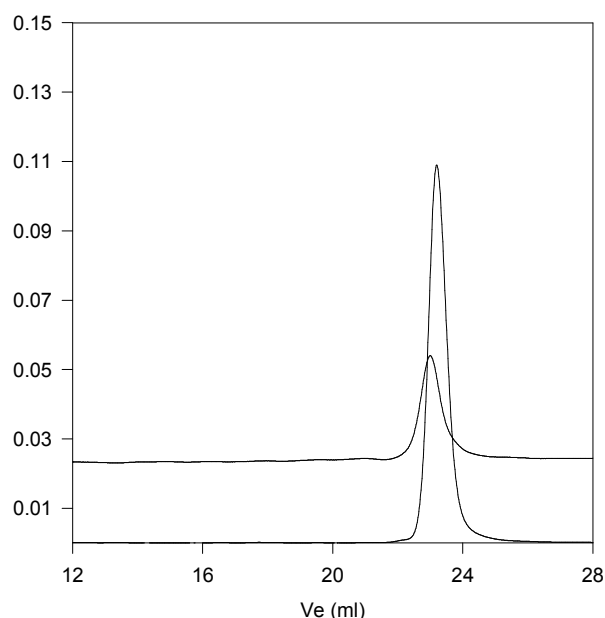
Poly(styrene-b-4-vinyl pyridine) is soluble in DMF, CHCl<sub>3</sub>. The polymer can also be solubilized in THF depending on its chemical composition. The polymer readily precipitates from hexanes and diethyl ether.

**<sup>1</sup>H-NMR Spectrum of Sample:**



**SEC of Sample #**

**P9007-S4VP**



Size exclusion chromatography of polystyrene-b-poly(4-vinylpyridine)

- Polystyrene, M<sub>n</sub>=47,000, M<sub>w</sub>=50,400, PI=1.08  
— Block Copolymer PS(47000)-b-P4VP(10000), PI=1.10 Run in DMF

**References:**

- (1). S. K. Varshney, X. F. Zhong & A. Eisenberg *Macromolecules*, **1993**, 26, 701-706.
- (2). Z. Gao, S. K. Varshney, S. Wong, A. Eisenberg *Macromolecules*, **1994**, 27, 7923-7927.