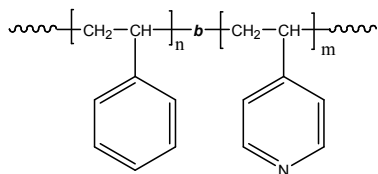


Sample Name: Poly(styrene-b-4-vinyl pyridine)

Sample #: P9233-S4VP

**Structure:**



**Composition:**

Mn x 10 <sup>3</sup> PS-b-4VP	PDI
124.0-b-12.0	1.15
T <sub>g</sub> for PS block: 103°C	T <sub>g</sub> for 4VP block: 147°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:**

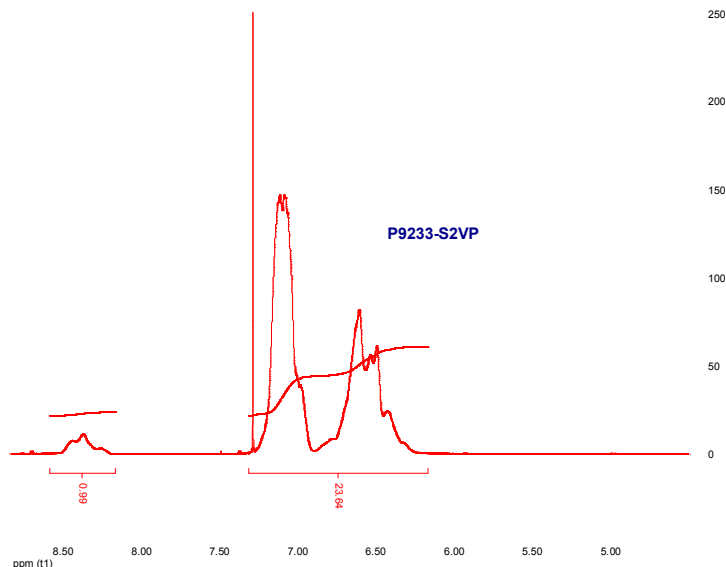
An aliquot of the anionic polystyrene block was terminated before addition of 4-vinyl pyridine and analyzed by size exclusion chromatography (SEC) in DMF to obtain the molecular weight and polydispersity index (PDI). The block copolymer composition was then calculated from <sup>1</sup>H-NMR spectroscopy 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:**

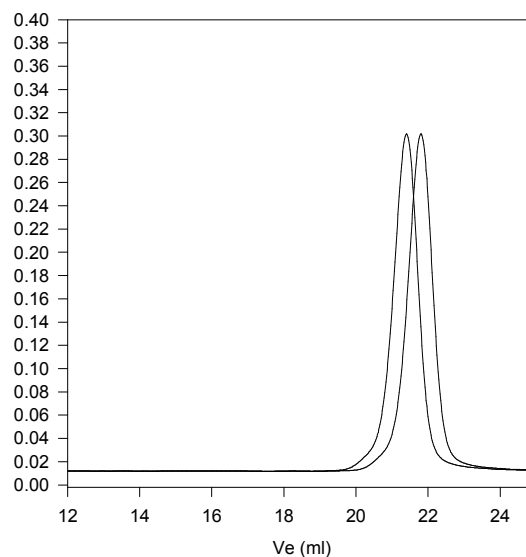
Poly(styrene-b-4-vinyl pyridine) is soluble in DMF, CHCl<sub>3</sub>. The polymer can also be solubilized in THF depending on its chemical composition. The polymer readily precipitates from hexanes and diethyl ether.

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



**SEC of Sample:**

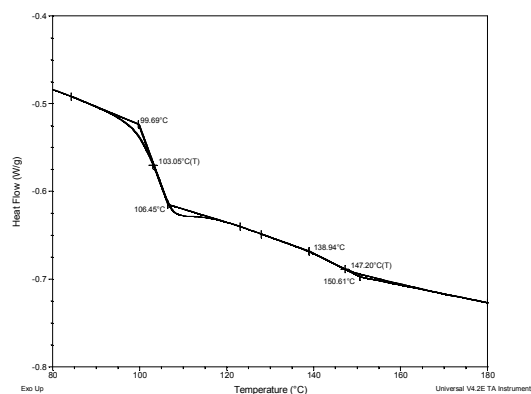
P9233-S4VP



Size exclusion chromatography of P(s-b-4VP) in DMF at 40 °C:

- PS block: M<sub>n</sub>=124000, M<sub>w</sub>=130000, PI=1.05
- Block Copolymer PS-4VP (120000)-b-4VP(12000), PI=1.15

**Thermograms of sample:**



**References:**

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