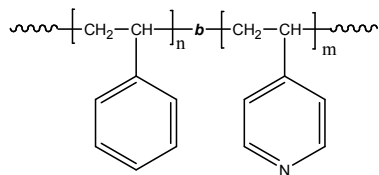


Sample Name: Poly(styrene-b-4-vinyl pyridine)

Sample #: P9872-S4VP

Structure:



Composition:

$M_n \times 10^3$ PS-b-4VP	PDI
105.0-b-2.5	1.10
T_g for PS block: 92°C	T_g for 4VP block: not detected

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.^{1,2}

Characterization:

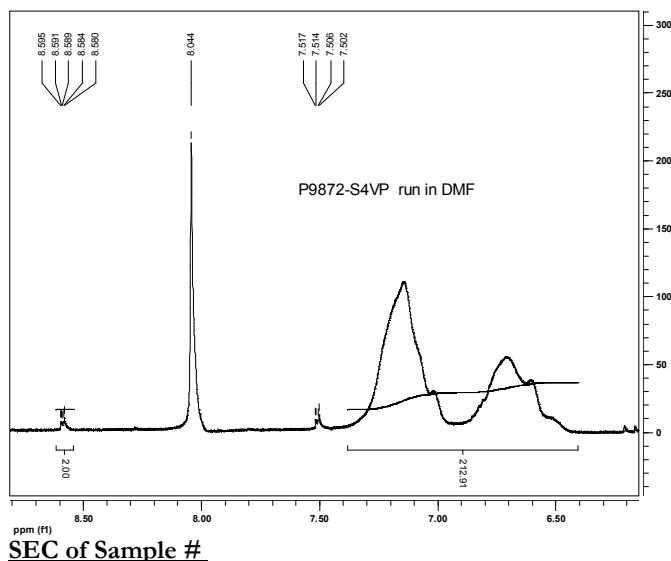
An aliquot of the anionic polystyrene block was terminated before addition of 4-vinyl pyridine and analyzed by size exclusion chromatography (SEC) in DMF to obtain the molecular weight and polydispersity index (PDI). The block copolymer composition was then calculated from $^1\text{H-NMR}$ spectroscopy 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_4 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 $15^\circ\text{C}/\text{min}$. The inflection glass transition temperature (T_g) of the sample has been considered.

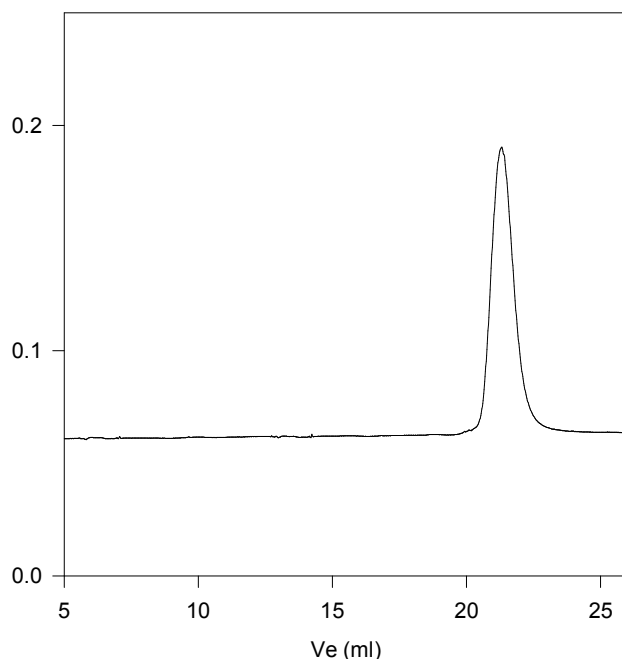
Solubility:

Poly(styrene-b-4-vinyl pyridine) is soluble in DMF, CHCl_3 . The polymer can also be solubilized in THF depending on its chemical composition. The polymer readily precipitates from hexanes and diethyl ether.

$^1\text{H-NMR}$ Spectrum of Sample:



P9872-S4VP



— SEC profile in DMF at 30 oC.
Polystyrene, $M_n=105,000$, M_w : 113,000 $PI=1.08$
— Block Copolymer PS(105,000)-b-P4VP(2500), $PI=1.10$
(composition by titration and by H NMR)

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.