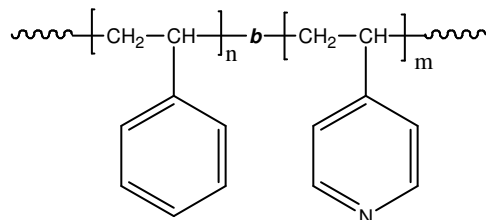


Sample Name: Poly(styrene-b-4-vinyl pyridine)

Sample #: P10971-S4VP

Structure:



Composition:

$M_n \times 10^3$ S-b-4VP	PDI
10.5-b-11.8	1.18

Tg for PS block:	105 °C
Tg for P4VP block:	130 °C

Synthesis Procedure:

Poly(styrene-b-4-vinyl pyridine) was prepared by living anionic polymerization in THF at -78°C in the presence of LiCl an additive.

Characterization:

An aliquot of the anionic polystyrene block was terminated before addition of 4VP and analyzed by size exclusion chromatography (SEC) 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 2VP proton at 8.2 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 on a TA Q100 differential scanning calorimeter at a heating rate of $10^\circ\text{C}/\text{min}$. The midpoint of the slope change of the heat flow plot of the second heating scan was considered as the glass transition temperature (T_g).

Solubility:

Poly(styrene-b-4 vinylpyridine) is soluble in THF, toluene, and CHCl_3 . The diblock copolymer can also be solubilized in methanol, ethanol depending on its composition. The polymer readily precipitates from hexanes, ether, and water.

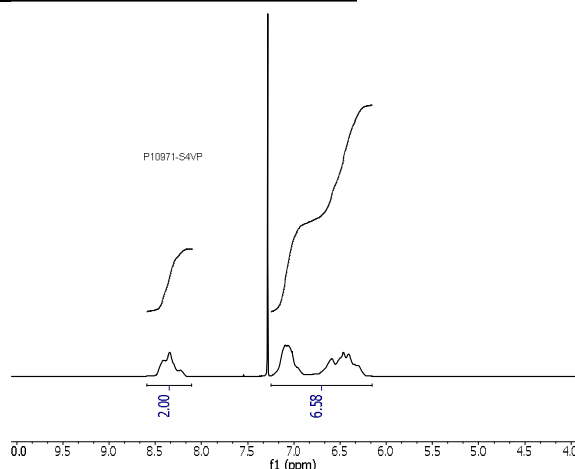
References:

- (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.

Purification of the obtained polymer was carried out rigorously as follows to ensure the removal of the catalyst side product:

1. The polymer was dissolved chloroform and washed with de-ionized distilled water to remove any soluble organic catalyst side products.
2. The polymer was extracted from water with chloroform.
3. The polymer solution in chloroform was dried over anhydrous sodium sulfate.
4. The polymer solution was filtered and passed through a column packed with basic Al_2O_3 .
5. The polymer solution was concentrated under reduced pressure.
6. The polymer solution was precipitated into cold hexane, and re-dissolved in benzene followed by freeze drying.
7. The product was dried under reduced pressure at 50°C for 48h.

^1H NMR Spectrum of the polymer



SEC of the polymer:

P10971-S4VP

