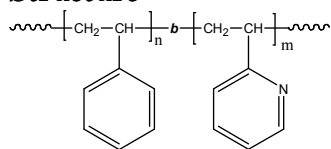


Sample Name: Poly(styrene-b-2-vinyl pyridine)

Sample #: P10087-S2VP

Structure:

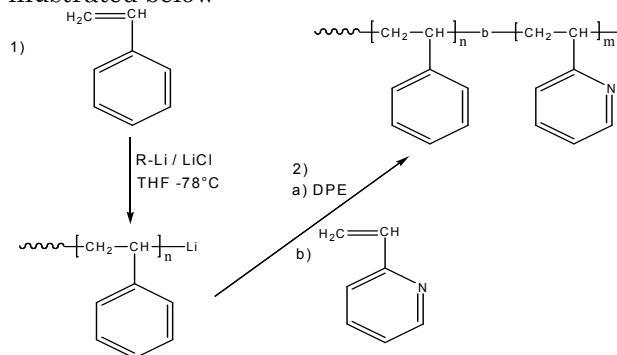


Composition:

Mn × 10 ³ S-b-2VP	PDI
26.0-b-4.8	1.15
T _g for 2VP block: Not distinct 93°C for 200k homopolymer)	T _g for PS block: 104 °C

Synthesis Procedure:

Poly(styrene-b-2-vinyl pyridine) is prepared by living anionic polymerization in THF at -78 °C in the presence of LiCl an additive. Polystyrene macroanions were end capped with a unit of diphenyl ethylene (DPE) before adding 2-vinylpyridine (2VP) monomer. For further details please see our published articles^{1,2} The scheme of the reaction is illustrated below:



Characterization:

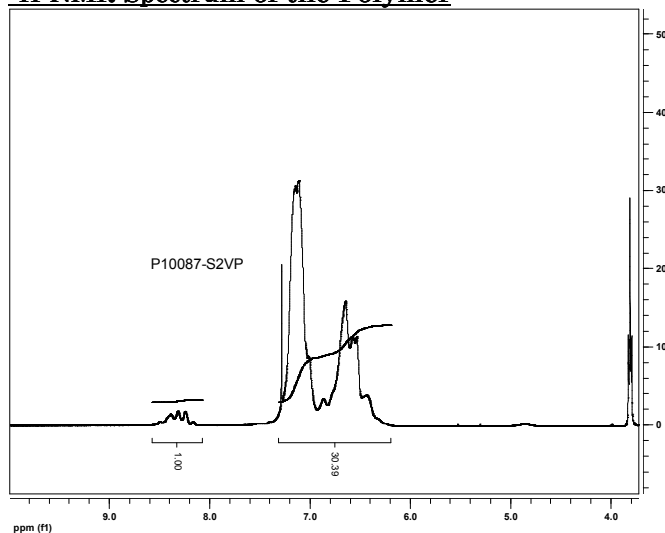
An aliquot of the anionic polystyrene block was terminated before addition of 2VP and analyzed by size exclusion chromatography (SEC) to obtain the molecular weight and polydispersity index (PDI). The Block copolymer composition was then calculated from ¹H-NMR spectroscopy by comparing the peak area 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/HClO₄ 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°C/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:

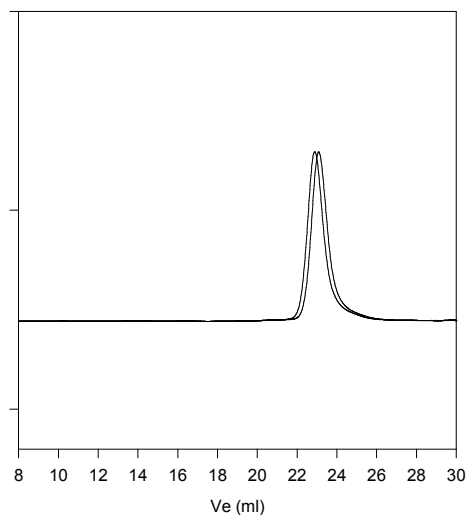
Poly(styrene-b-2 vinylpyridine) is soluble in THF, toluene, and CHCl₃. The diblock copolymer can also be solubilized in methanol, ethanol depending on its composition. The polymer readily precipitates from hexanes, ether and water.

¹H-NMR Spectrum of the Polymer



SEC for the polymer:

P10087-S2VP

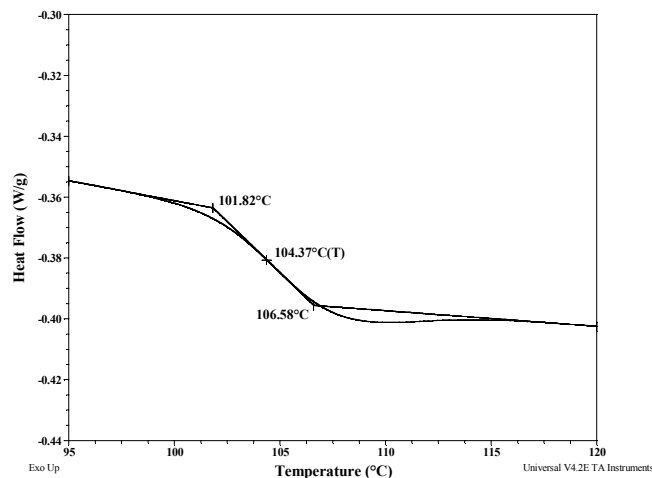


Size exclusion chromatography of poly(styrene-b-2-vinyl pyridine)

— Polystyrene, M_n=26,000 Mw:29,000 PI=1.12

— Polystyrene(26,000)-b-Poly(2-vinyl pyridine)(4,800),PI=1.15

DSC thermogram for the PS block:



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.