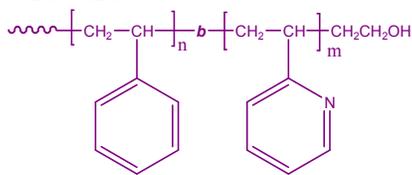


Sample Name:
Hydroxy terminated Poly(styrene-b-2-vinyl pyridine)
Sample #: P4853-S2VPOH

Structure:

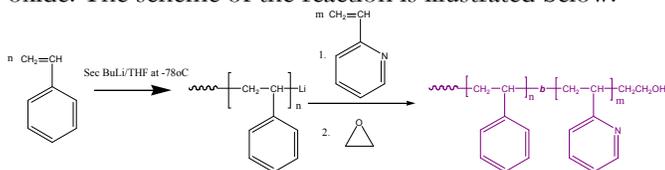


Composition:

Mn x 10 ³ S-b-2VP	PDI
45.0-b-16.0	1.06

Synthesis Procedure:

Poly(styrene-b-2-vinyl pyridine-ethylene oxide) triblock copolymer is prepared by living anionic polymerization. The triblock is synthesized in 2 steps: first a OH terminated Poly(S-b-2VP) is synthesized 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. The reaction was terminated with ethylene oxide. 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 and EO protons at 3.6 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.

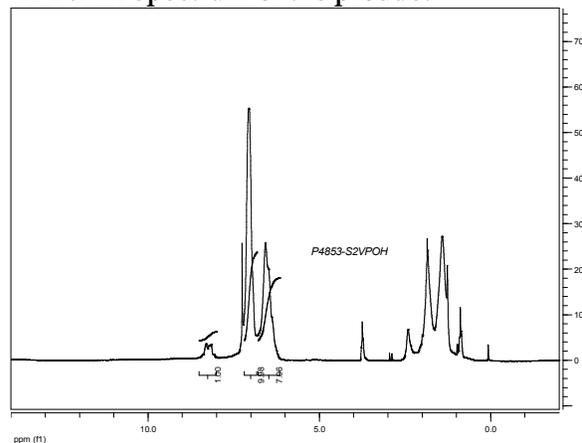
Thermal analysis:

Thermal analysis of the samples was carried out using a differential scanning calorimeter (TA Q100) at a heating rate of 10°C/min. The inflection glass transition temperature (T_g) has been considered.

Solubility:

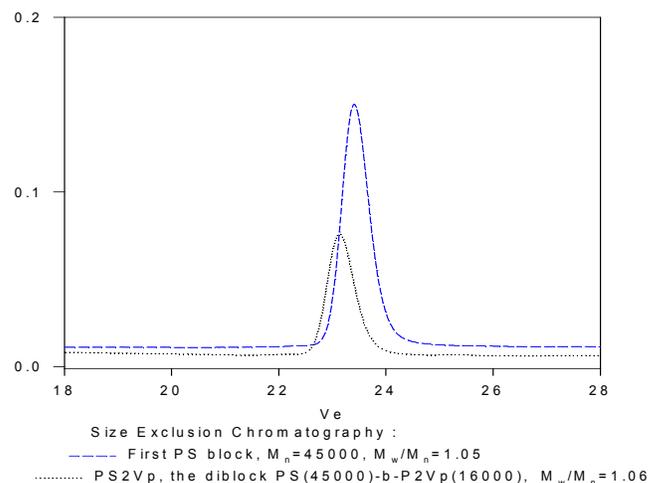
Poly(styrene-b-2 vinylpyridine-b-ethylene oxide) is soluble in THF, toluene, and CHCl₃. The triblock copolymer can also be solubilized in methanol, ethanol depending on its composition. The polymer readily precipitates from hexanes, ether and water.

¹H-NMR Spectrum of the product

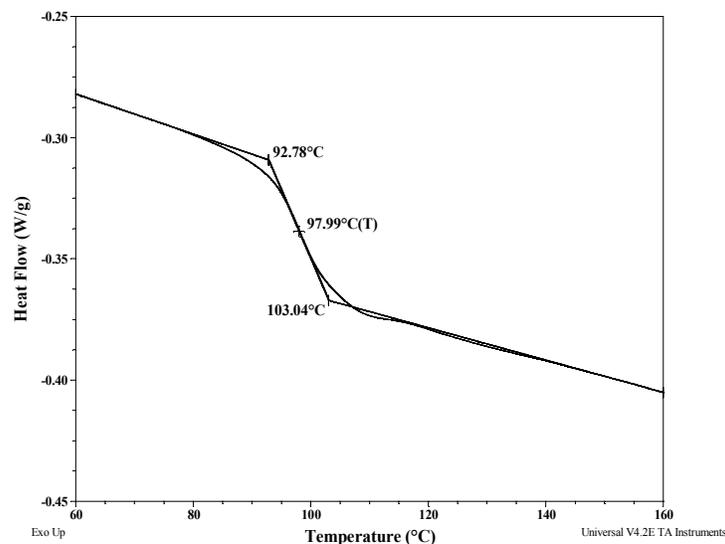


SEC for the functional polymer:

P 4 8 5 3 - S 2 V P O H



DSC thermogram for the sample:



References:

1. S. K. Varshney, X. F. Zhong and A. Eisenberg *Macromolecules* **1993**, 26, 701-706.
2. Gohy, J.-F., Lohmeijer, B. Varshney S,K, Decamps B., Leroy E., Boileau S., Schubert U. S., *Stimuli-responsive aqueous micelles from an ABC metallo-supramolecular triblock copolymer*, *Macromolecules* 2002, 35, 9748-9755.
3. Gohy, J.-F., Mores S., Varshney S. K., Jerome, R., *Self-organization of water-soluble complexes of a poly(2-vinylpyridinium)-block-poly(ethylene oxide) diblock and a fluorinated anionic surfactant*, *Macromolecules* 2003, 36, 2579-2581.