<u>Sample Name</u>: **Poly(styrene-b-2-vinyl pyridine)**
<u>Sample #</u>: **P9260-S2VP**
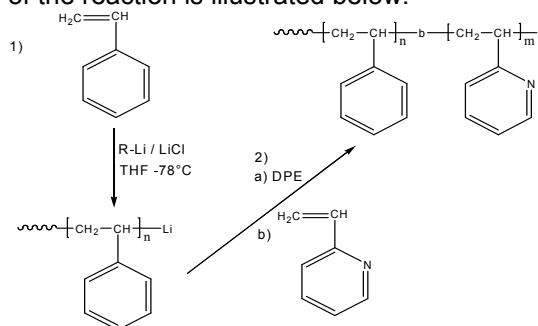
Structure:

Composition:

Mn × 10^3 S-b-2VP	PDI
800.0-b-35.0	1.6
T_g for PS block: 103°C	T_g for 2VP block: Not distinct; For homopolymer of 100k: 96°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:
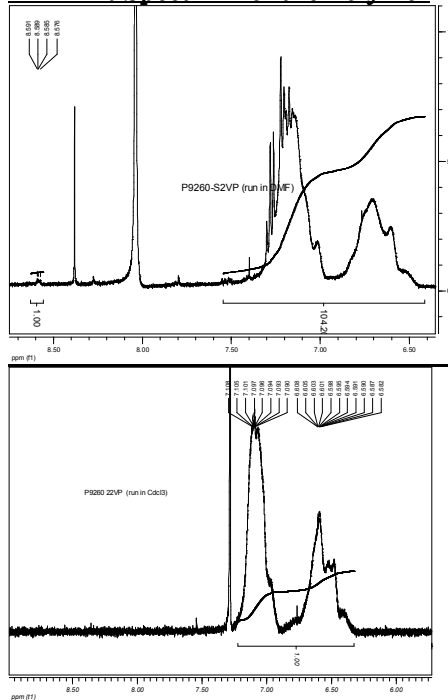

Characterization:

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 ^{1}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/HClO4 using crystal violet indicator.Copolymer PDI is determined by SEC.
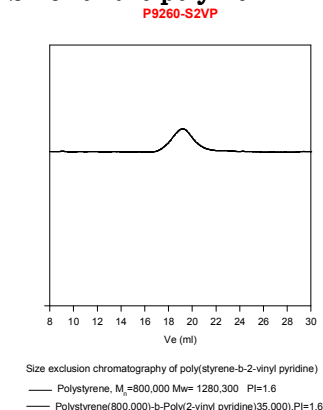
Solubility:

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.
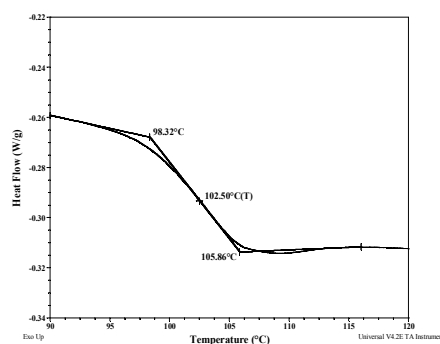
SEC for the polymer

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

— Polystyrene, M_n=800,000 Mw= 1280,300 PI=1.6
— Polystyrene(800,000)-b-Poly(2-vinyl pyridine)35,000),PI=1.6

DSC thermogram for 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.