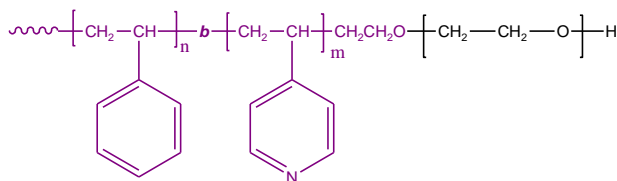


Sample Name:

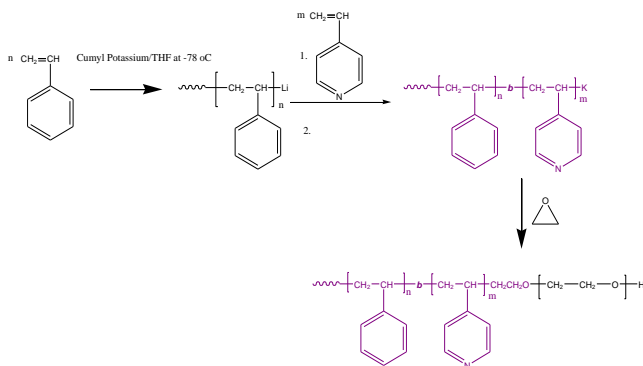
Poly(styrene-b-4-vinyl pyridine-ethylene oxide)

Sample #: P8503-S4VPEO**Structure:****Composition:**

Mn x 10 ³ S-b-4VP-b-EO	PDI
60.0-b-32.0-b-39.5	1.2

Synthesis Procedure:

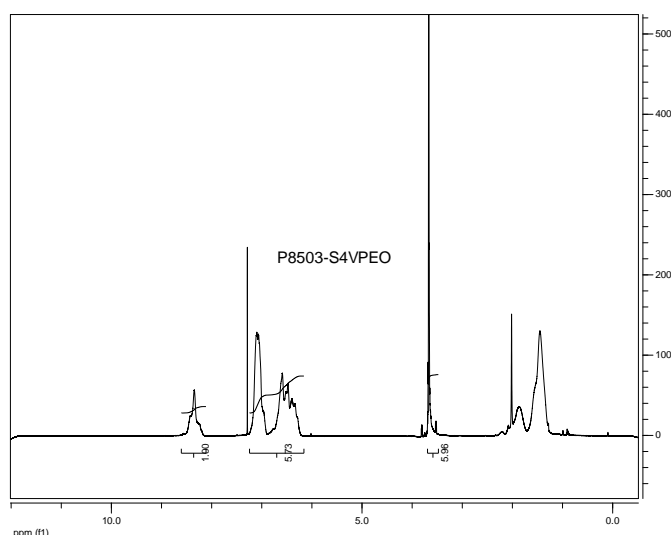
Poly(styrene-b-4-vinyl pyridine-ethylene oxide) triblock copolymer is prepared by living anionic polymerization. The triblock is synthesized by successive addition of monomer using cumyl potassium as initiator. For further details please see the following scheme.

**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 ¹H-NMR spectroscopy by comparing the peak area of the 4VP 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.

Solubility:

Poly(styrene-b-4 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 polymer**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.
4. Leil L., Gohy J.-F., Willet N., , Zhang J.-X., Varshney S., Jerome R., *Tuning of the morphology of core-shell-corona aqueous micelles: I. sphere-to-cylinder transition*, *Macromolecules* 2004, 37, 1089-1094.
5. Jean-Francois Gohy, Bas G. G. Lohmeijer, Sunil K. Varshney, and Ulrich S. Schubert, *Covalent vs Metallo-supramolecular Block Copolymer Micelles* *Macromolecules* 2002, 35, 7427-7435.

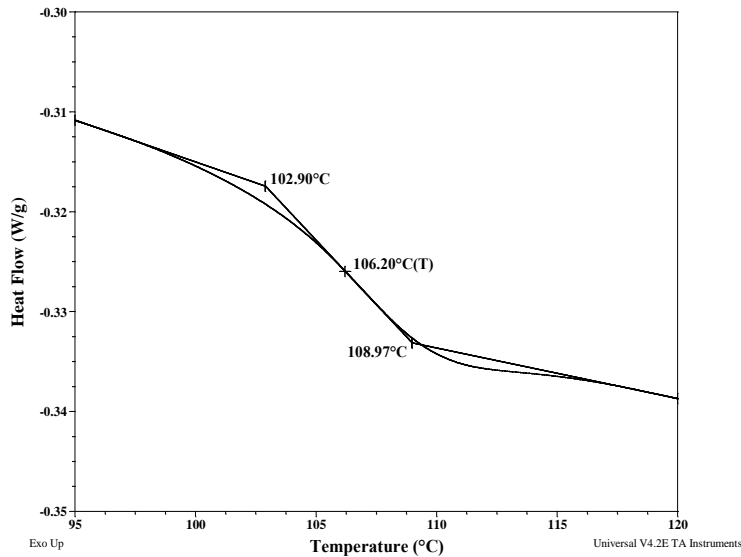
Thermal Analysis of the sample P8503-S4VPEO

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).

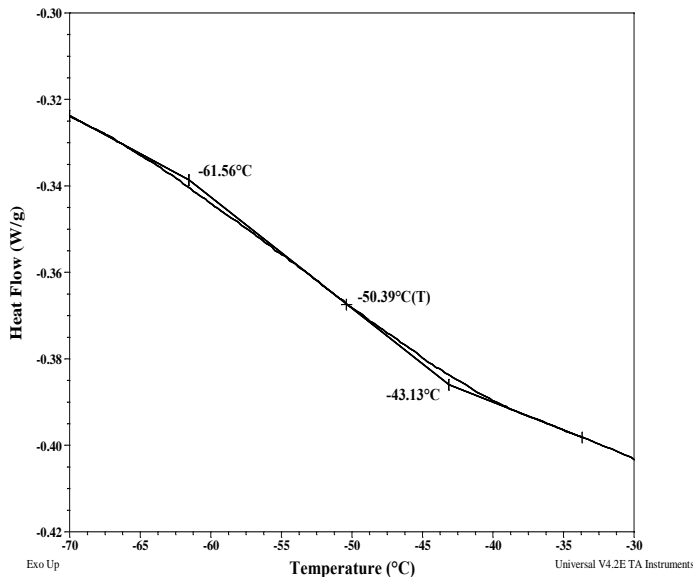
Thermal analysis results at a glance

For PS block: T_g : 106°C		For 4VP block: T_g : Not distinct
For PEO block		
T_g : -50°C	T_m : 58°C	T_c : 29°C

Thermogram for PS block:



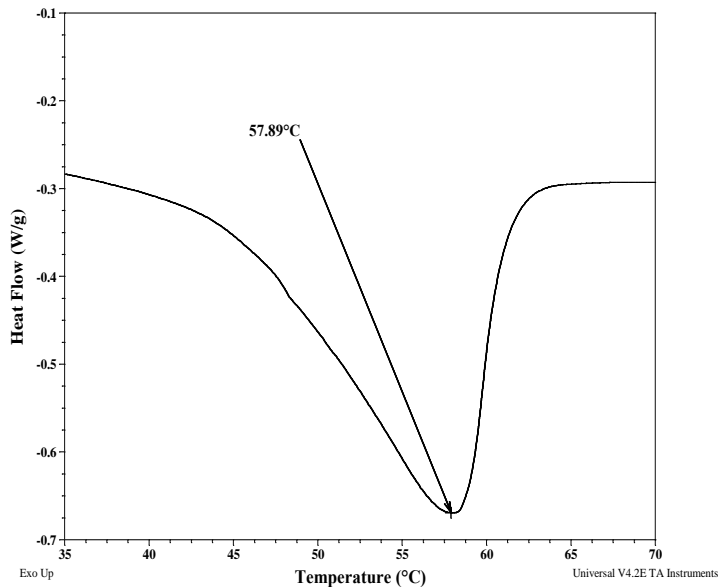
Thermogram for PEO block:



Melting and crystallization curve for the sample

The melting temperature (T_m) was taken as the maximum of the endothermic peak where as the crystallization temperature (T_c) was considered as the minimum of the exothermic peak.

Melting curve for PEO block



Crystallization curve For PEO block

