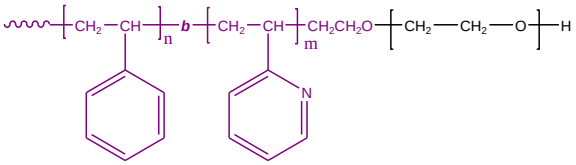
Sample Name:

Poly(styrene-b-2-vinyl pyridine-ethylene oxide)

Sample #: P11375-S2VPEO

Structure:



Composition:

Mn x 10^3 S-b-2VP-b-EO	PDI
45.0-b-38.0-b-58.0 Calculated from ^{H}NMR	1.15

***Synthesis Procedure*:**

Poly(styrene-b-2-vinyl pyridine-ethylene oxide) triblock copolymer is prepared by living anionic polymerization by successive addition of monomer using cumyl potassium as initiator.

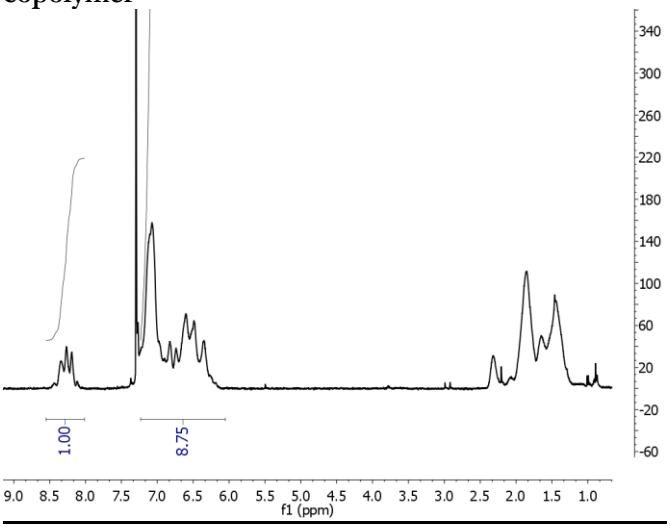
Characterization:

Polymer at different stages of polymerization was analyzed by size exclusion chromatography (SEC).The Block copolymer composition was then calculated from ^{1}H-NMR spectroscopy .

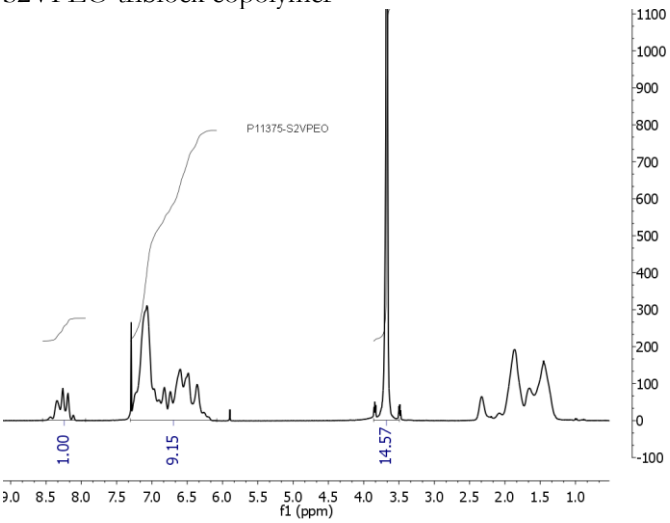
Solubility:

Poly(styrene-b-2 vinylpyridine-b-ethylene oxide) is soluble in THF, toluene, and $CHCl_3$.

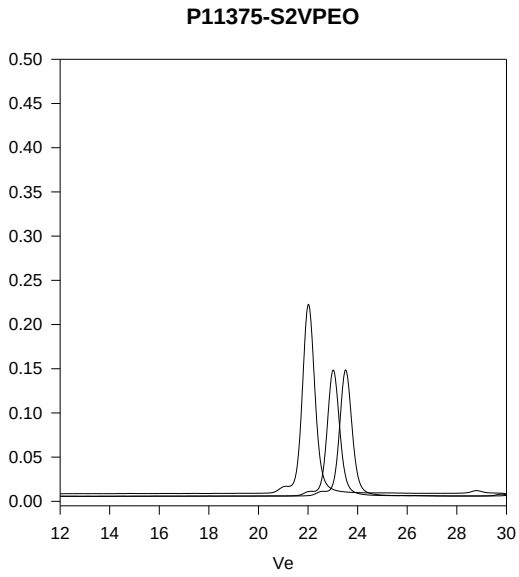
^{1}H-NMR Spectrum of the polymer S2 VP diblock copolymer



S2VPEO triblock copolymer



SEC for the triblock polymer:



Size Exclusion Chromatography :

First PS block, M_n=45,000 Mw: 48,500, M_w/M_n=1.07

PS2Vp, the diblock PS(45,000)-b-P2Vp(38,000), M_w/M_n=1.10

PS2VPEO, the triblock PS(45,000)-b-P2Vp(38,000)-b-PEO(58,000) M_w/M_n=1.15 (composition from H NMR)

References:

1. S. K. Varshney, X. F. Zhong and A. Eisenberg *Macromolecules* **1993**, 26, 701-706.

2. Gohy J.-F., Willet N., , Zhang J.-X., Varshney S., Jerome, ., *pH dependence of the morphology of aqueous micelles formed by poly(styrene)-block-poly(2-vinylpyridine)-block-poly(ethylene oxide) copolymers,* e-polymers 2002, 35.

3. 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.

4. 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.

5. 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.

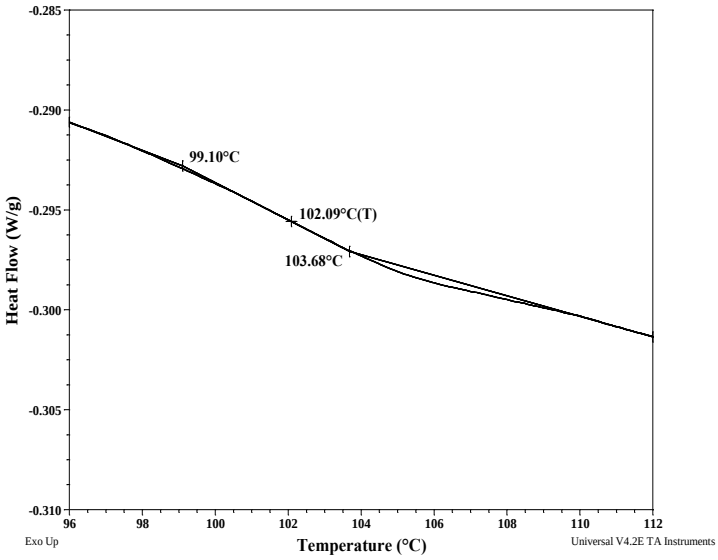
Thermal Analysis of the sample S2VPEO

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).

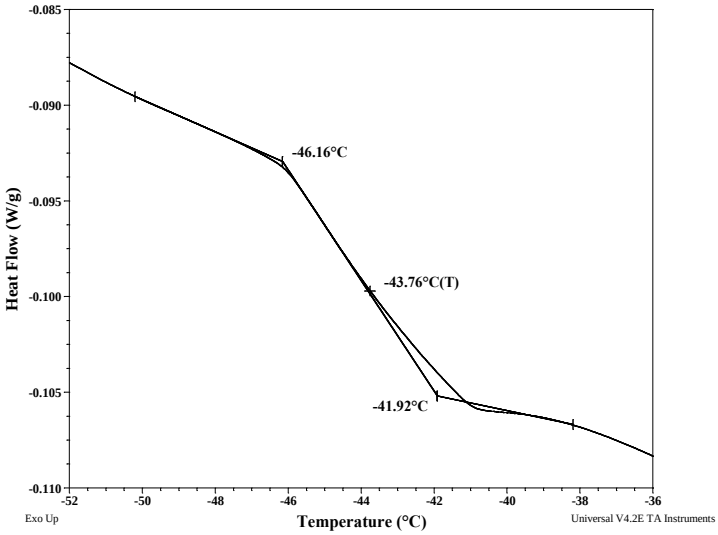
Thermal analysis results at a glance

For PS block: T_g: 102°C		**For 2VP block**: T_g: Not distinct
For PEO block		
T_g: -44°C	T_m: 61°C	T_c: 34°C

Thermogram for PS block:



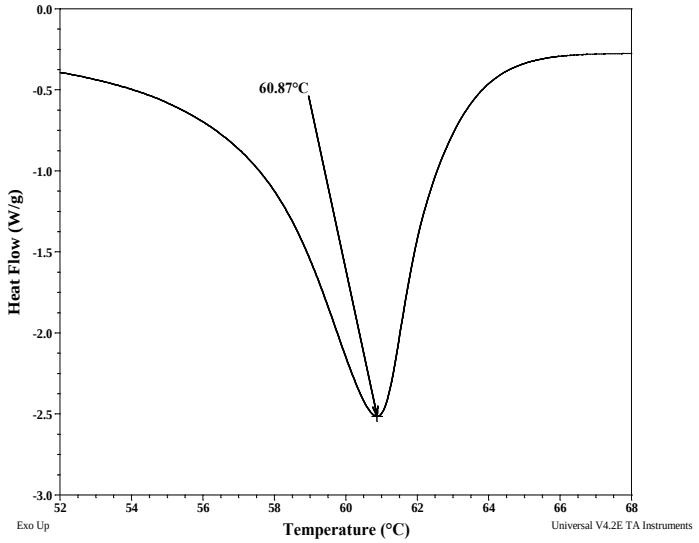
Thermogram for PEO block:



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