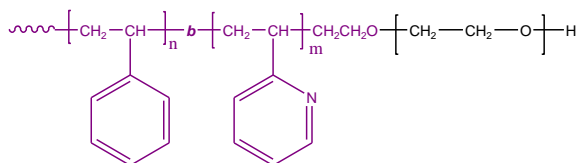


Sample Name:

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

Sample #: P18222-S2VPEO

Structure:



Composition:

Mn x 10 ³ S-b-2VP-b-EO	PDI
13.0-b-14.5-b-24,0 Calculated from ¹ H-NMR	1.11

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.

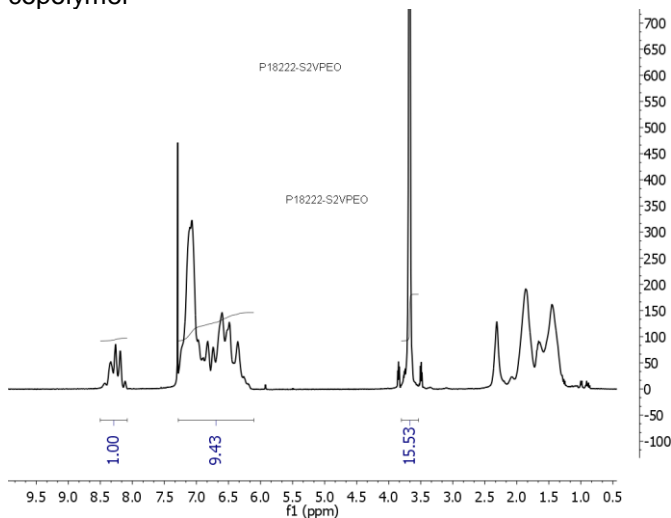
Characterization:

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

Solubility:

Poly(styrene-b-2-vinylpyridine-b-ethylene oxide) is soluble in THF, toluene, and CHCl₃.

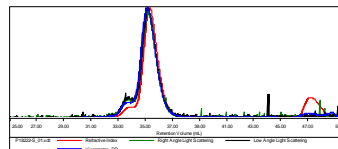
¹H-NMR Spectrum of the polymer S2 VPEO triblock copolymer



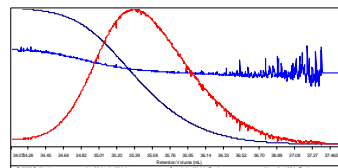
SEC for the triblock polymer:

Sample ID: P18222-S-

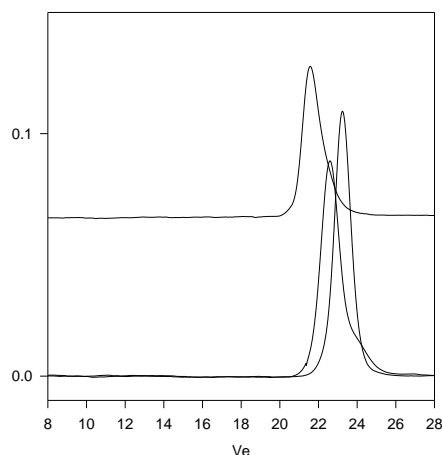
Concentration (mg/mL)	14.0385
Sample dilute (mL/g)	0.1680
Method File	PS2VK-Sep26-2015-0000.vcm
Column Set	3x PL 1113-6300
System	System 1



Sample	Mn	Mw	Mp	Mw/Mn	IV
P18222-S, v08	13,308	13,864	13,200	1.042	0.1402



P18222-S2VPEO



Size Exclusion Chromatography :

- First PS block, M_n=13,000, M_w/M_n=1.09
- PS2Vp, the diblock PS(13,000)-b-P2Vp(14,500), M_w/M_n=1.09
- PS2VpEO, the triblock PS(13,000)-b-P2Vp(14,500)-b-PEO(24,000) M_w/M_n=1.11 (composition from ¹H NMR)

References:

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

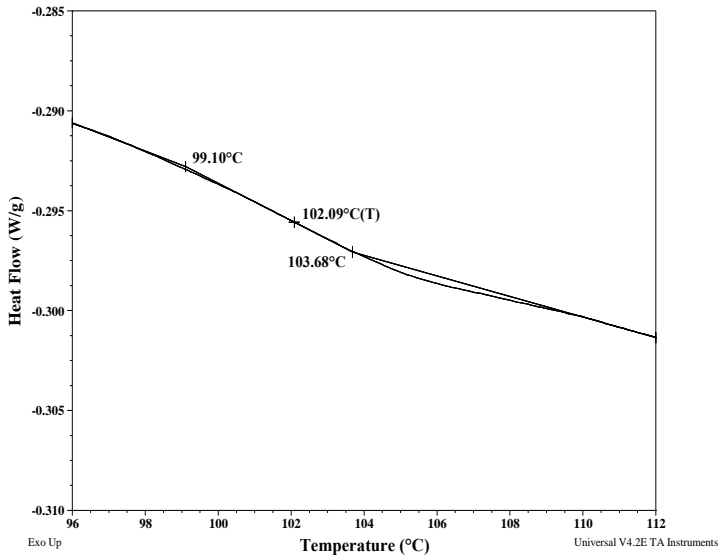
Thermal Analysis of the sample S2VPEO

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).

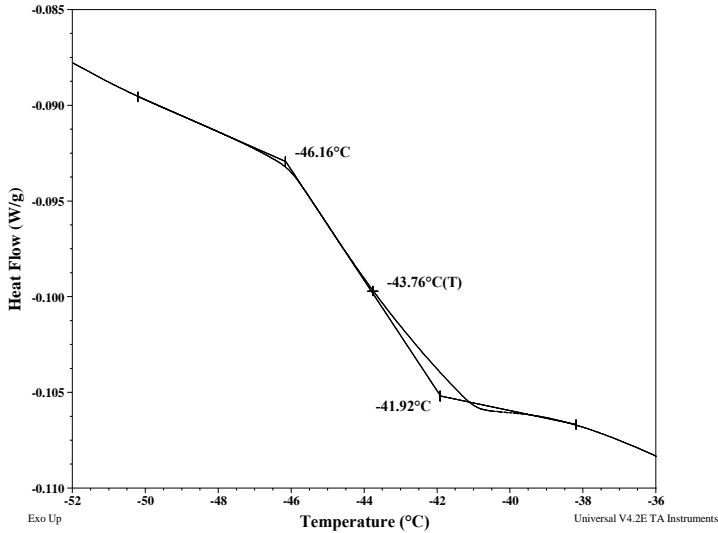
Thermal analysis results at a glance

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:



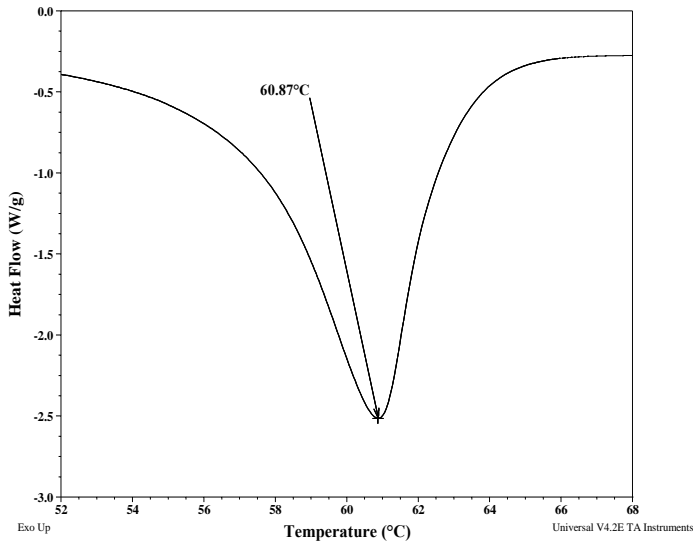
Thermogram for PEO block:



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

