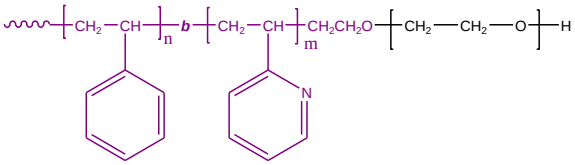
Sample Name:

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

Sample #: P18221-S2VPEO

Structure:



Composition:

Mn x 10^3 S-b-2VP-b-EO	PDI
20.0-b-15.0-b-27.0 Calculated from ^{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.

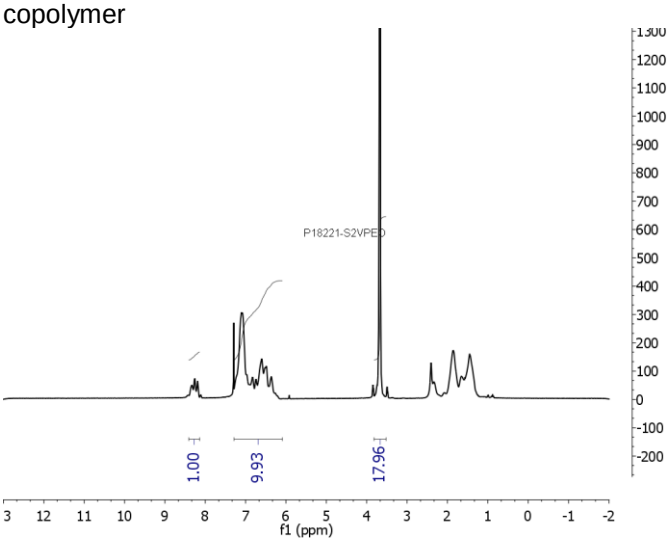
Characterization:

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

Solubility:

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

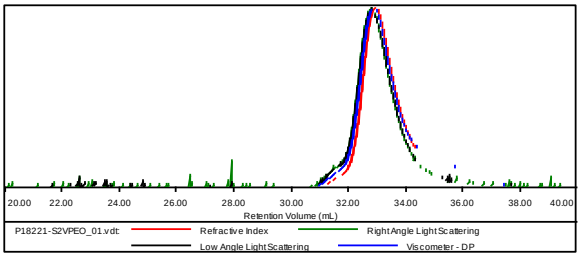
^{1}H-NMR Spectrum of the polymer S2 VPEO triblock copolymer



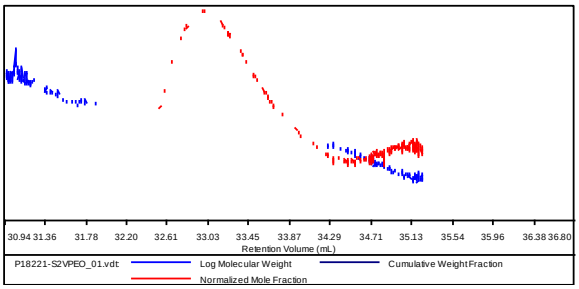
SEC for the triblock polymer:

Sample ID: P18221-S2VPEO

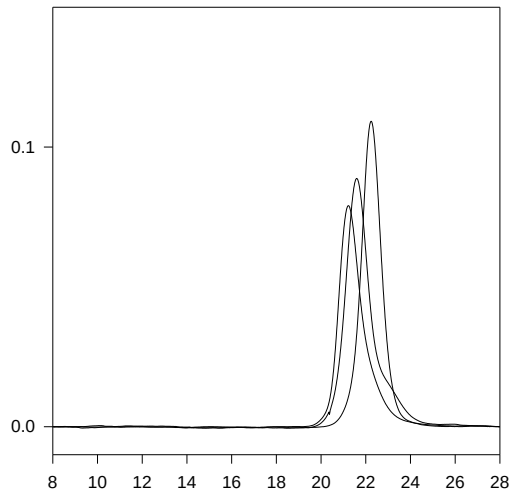
Concentration (mg/mL)	9.2512
Sample dn/dc (mL/g)	0.1110
Method File	PS80K-Sep26-2013-0000.vcm
Column Set	3x PL 1113-6300
System	System 1



Sample	Mn	Mw	Mp	Mw/Mn	IV
P18221-S2VPEO_01.vdt	59,153	65,204	64,357	1.102	0.3435



P18221-S2VPEO



Size Exclusion Chromatography :

—— First PS block, M_n=20,000, M_w/M_n=1.09

—— PS2Vp, the diblock PS(20,000)-b-P2Vp(15,000), M_w/M_n=1.09

—— PS2VpEO, the triblock PS(20,000)-b-P2Vp(15,000)-b-PEO(27,000) M_w/M_n=1.11 (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.

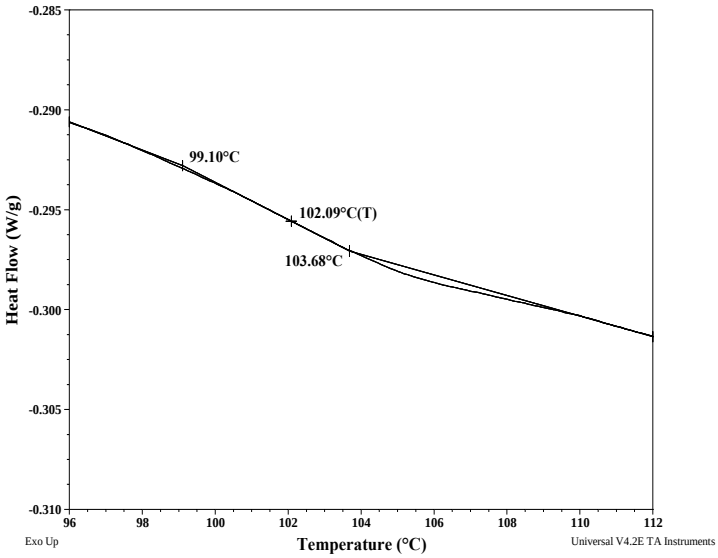
Thermal Analysis of the sample S2VPEO

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).

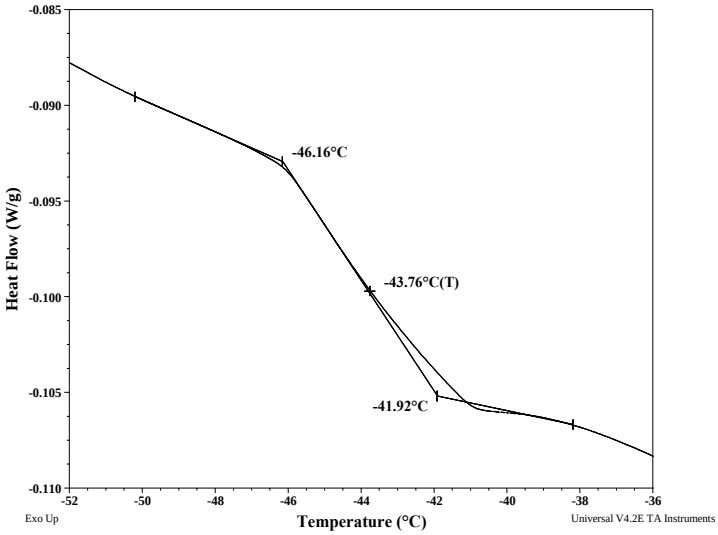
Thermal analysis results at a glance

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:



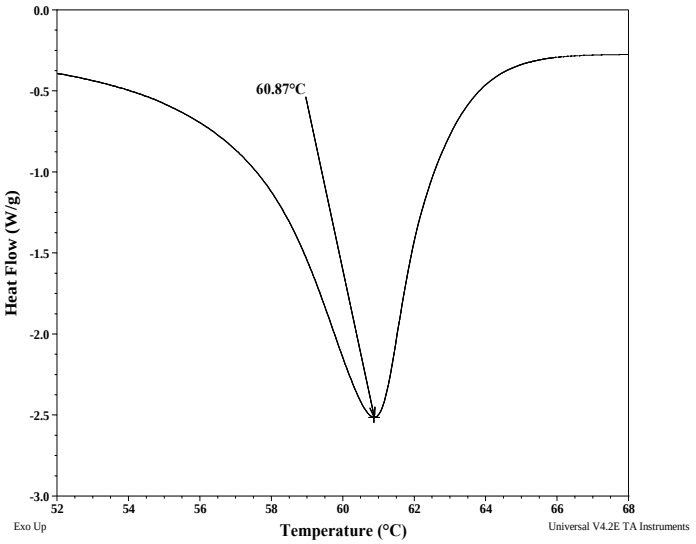
Thermogram for PEO block:



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