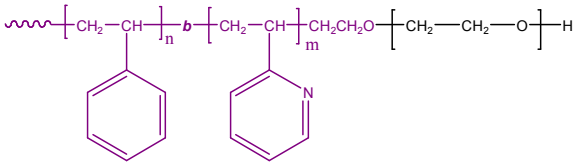
Sample Name:
Poly (styrene-b-2-vinyl pyridine-ethylene oxide)
Electronic Grade

Sample #: **P40170E-S2VPEO**

Structure:



Composition:

Mn x 10^3 S-b-2VP-b-EO	PDI
75.0-b-9.0-b-23.0 Calculated from ^{1}H NMR	1.04

Synthesis Procedure:
Poly(styrene-b-2-vinyl pyridine-ethylene oxide) triblock copolymer was synthesized by living anionic polymerization by successive addition of monomer using cumyl potassium as initiator.

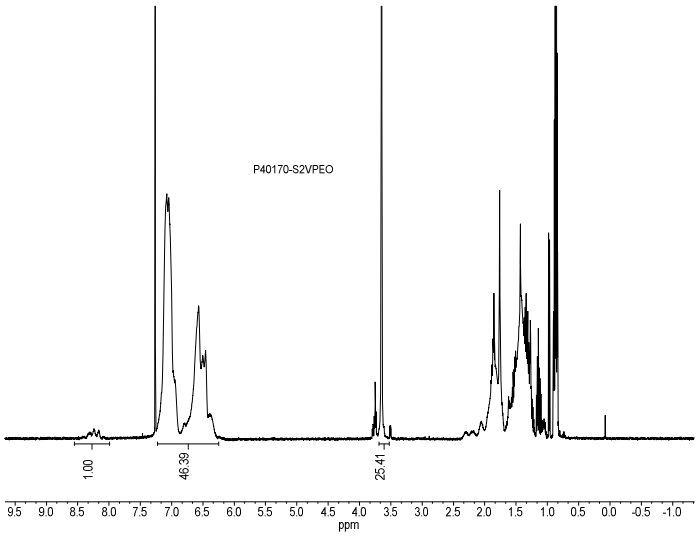
Characterization:
Polymer at different stages of polymerization was analyzed by size exclusion chromatography (SEC).The Block copolymer composition was then calculated from ^{1}H-NMR spectroscopy.

Purification of the obtained polymer:
Purification of the obtained polymer was carried out rigorously as follows to ensure the removal of the catalyst side product:

1. Dissolved the polymer in de-ionized distilled water to remove the any insoluble organic catalyst side product.
2. Polymer extracted from water with dichloromethane.
3. Polymer solution in dichloromethane was dried over anhydrous sodium sulfate.
4. Solution filtered and then passed through a column packed with basic Al_2O_3 .
5. Solution concentrated on rota-evaporator
6. Solution precipitated in cold hexane.
7. Polymer redissolved in Benzene and filter through 1 micron filter and lyophilized from Benzene
8. Dried under vacuum for 48h at 38 oC.

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

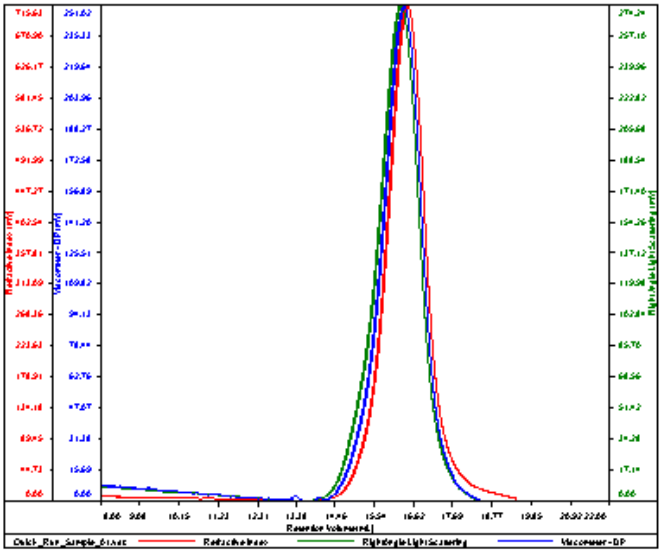
^{1}H NMR spectrum of the triblock copolymer:



SEC elugram of the triblock copolymer:

S Block

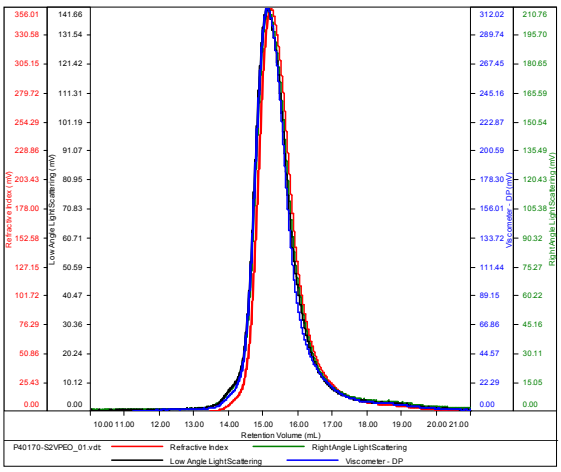
Conc (mg/mL)	8.3938
dn/dc (mL/g)	0.1650
Method	PS80k-August-08-2016-0000.ucm
Solvent	DMF w/0.023M LiBr
Column	PSS



Sample	Mn	Mw	Mp	Mw/Mn	IV
Quick_Run_Sample_01.wdt	75,572	80,830	59,386	1.070	0.5690

P40170E-S2VPEO

Conc (mg/mL)	7.2568
dn/dc (mL/g)	0.1500
Method	PS80k-October2016-0000.vcm
Solvent	DMF w 0.023M LiBr
Column	PSS



Sample	Mn	Mw	Mp	Mw/Mn	IV
P40170-S2VPEO_01.vdt	106,082	110,720	106,764	1.044	1.1656

Thermal Analysis of the sample S2VPEO

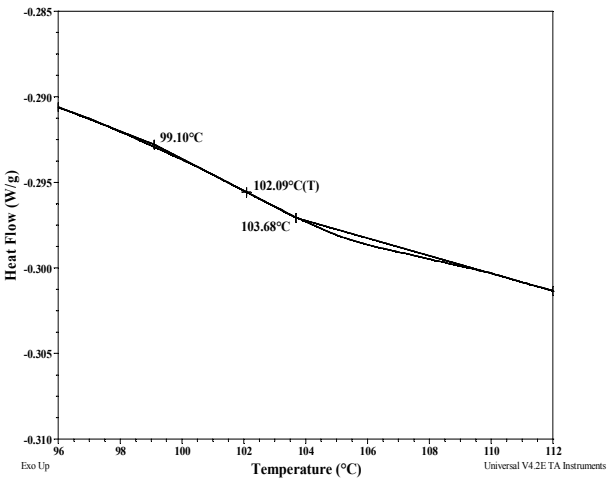
Thermal analysis of the samples was carried out on a TA Q100 differential scanning calorimeter at a heating rate of 10°C/min.The midpoint of the slope change of the heat flow plot of the second heating scan was considered as the glass transition temperature (T_g).

Thermal analysis results at a glance

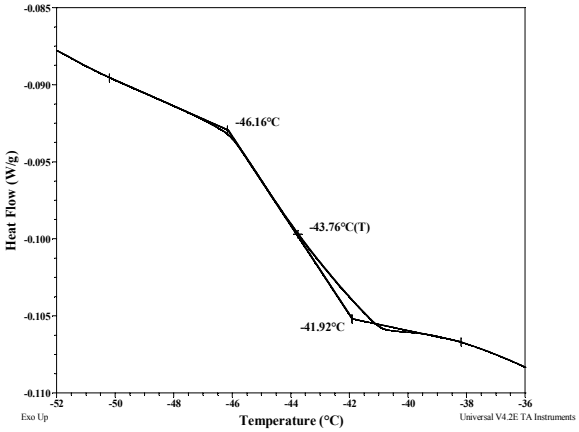
For PS block:	**For 2VP block**:
T_g: 102°C	T_g: Not distinct

For PEO block		
T_g: -44°C	T_m: 61°C	T_c: 34°C

Thermogram for PS block:



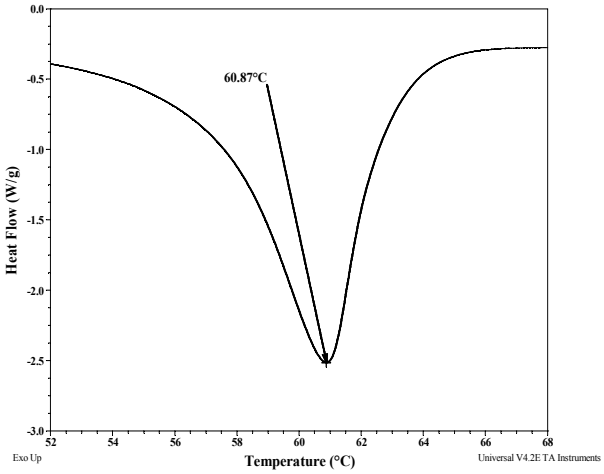
Thermogram for PEO block:



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: