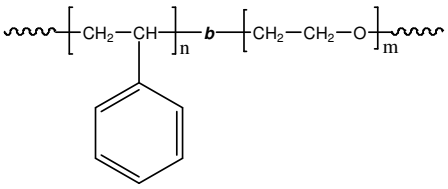
Sample Name: Poly(styrene-b-ethylene oxide)

Sample #: P11215A-SEO

Structure:



Composition:

Mn x 10^3 S-b-EO	PDI
20.5-b-8.0	1.09

Synthesis Procedure:

Poly(styrene-b-ethylene oxide) diblock copolymer is prepared by living anionic polymerization.

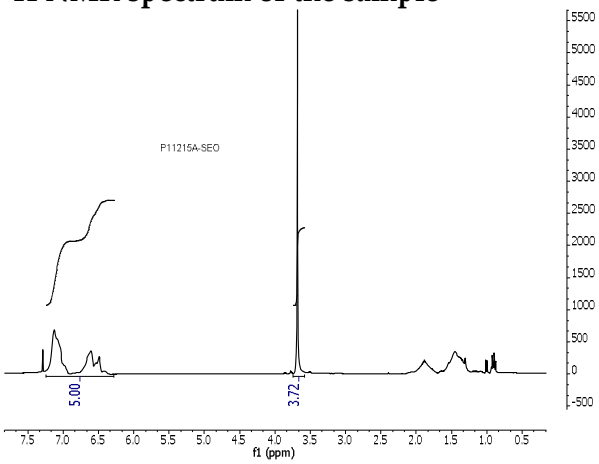
Characterization:

The molecular weight and polydispersity index (PDI) of the block copolymer are characterized by size exclusion chromatography (SEC). The composition of the block copolymer was calculated from ^{1}H-NMR by comparing the peak area of the phenyl polystyrene protons between 6.4 to 7.2 ppm and the ethylene oxide protons at 3.65 ppm.

Solubility:

The polymer is soluble in THF (at 35 °C), $CHCl_3$, benzene, toluene, dioxane. Low molecular weight SEO with high contents of the polyethylene oxide block can also be solubilized in methanol and water.

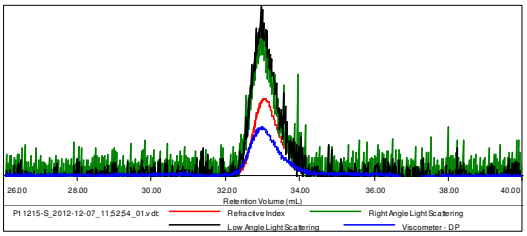
^{1}H NMR spectrum of the sample



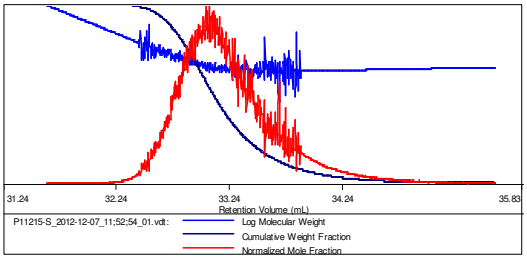
SEC profile of the block copolymer

Sample ID: P11215-S

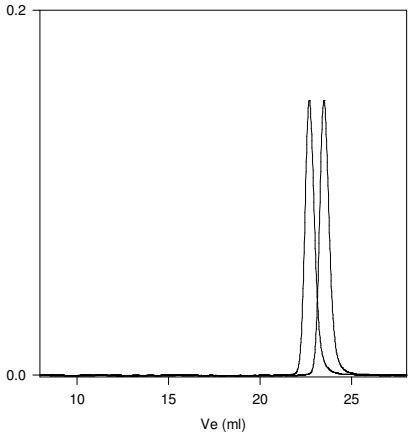
Concentration (mg/mL)	0.6212
Sample dn/dc (mL/g)	0.1850
Method File	PS80K-Dec-2012-0000.vcm
Column Set	3x PL 1113-6300
System	System 1



Sample	Mn (Da)	Mw (Da)	Mp (Da)	Mw/Mn	IV (dL/g)
P11215-S_2012-12-07_11;52;54_01.vdt	20,709	21,787	21,964	1.052	0.2449



P11215A-SEO



Size Exclusion Chromatography:

Polystyrene, M_n=20,500, M_w=21,000, PI=1.05

Block Copolymer Polystyrene-b-Poly(ethylene oxide)

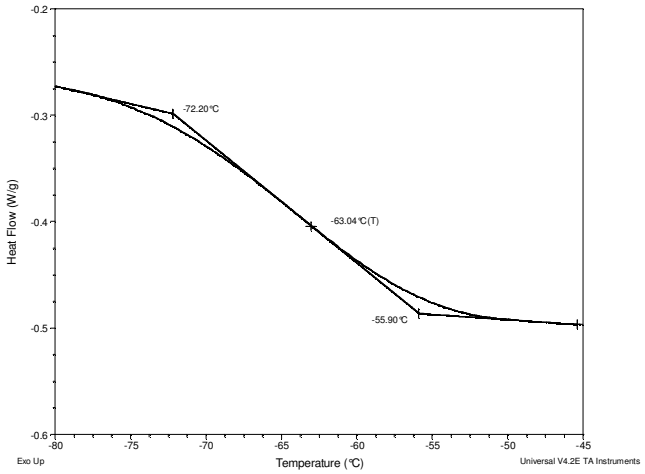
Mw: PS(20,500)-b-PEO(8,000), PI=1.09

Thermal analysis of the sample# P11215-SEO

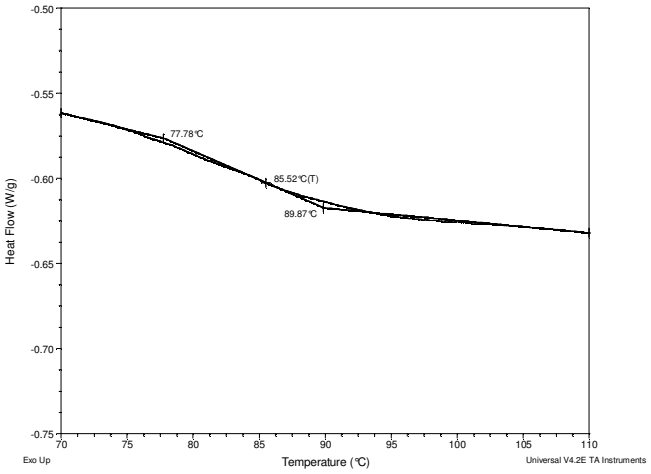
Thermal analysis of the samples was carried out on a TA Q100 differential scanning calorimeter at a heating rate of 20°C/min.The midpoint of the slope change of the heat flow plot of the second heating scan was considered as the glass transition temperature (T_g).

Thermogram for the sample

For PEO block:



For PS block



Thermal analysis results at a glance

For PS block T_g: 86°C		
For PEO block		
T_g: -63°C	T_m: 48°C	T_c: -35°C

Melting and crystallization curve for the PEO block

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.