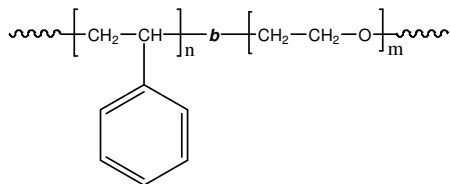


**Sample Name:** Poly(styrene-b-ethylene oxide)

**Sample #:** P11215B-SEO

**Structure:**



**Composition:**

Mn x 10 <sup>3</sup> S-b-EO	PDI
20.5-b-9.0	1.09

**Synthesis Procedure:**

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

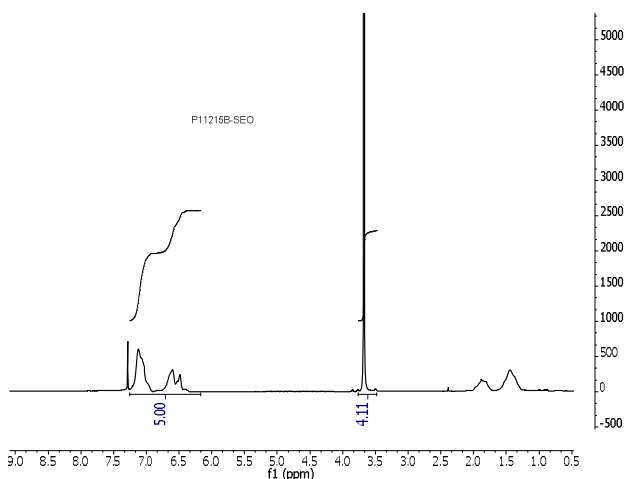
**Characterization:**

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 <sup>1</sup>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<sub>3</sub>, benzene, toluene, dioxane. Low molecular weight SEO with high contents of the polyethylene oxide block can also be solubilized in methanol and water.

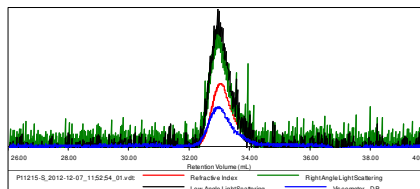
**<sup>1</sup>H NMR spectrum of the sample**



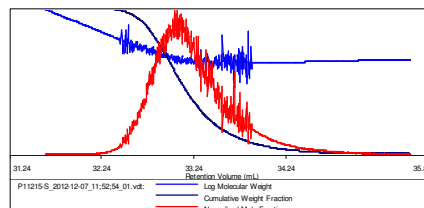
**SEC profile of the block copolymer**

Sample ID: P11215-S

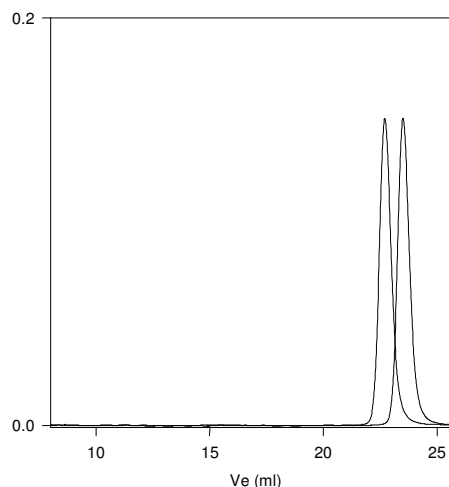
Concentration (mg/mL)	0.6212
Sample dn/dc (mL/g)	0.1850
Method File	PS80K-Dec-2012-0000.vcm
Column Set	3x PL 1113-6300
System	Sy stem 1



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



**P11215B-SEO**



Size Exclusion Chromatography:

- Polystyrene, M<sub>n</sub>=20,500, M<sub>w</sub>=21,000, PDI=1.05
- Block Copolymer Polystyrene-b-Poly(ethylene oxide)  
Mw: PS(20,500)-b-PEO(9,000), PDI=1.09

Thermal analysis of the sample# P11215B-SEO

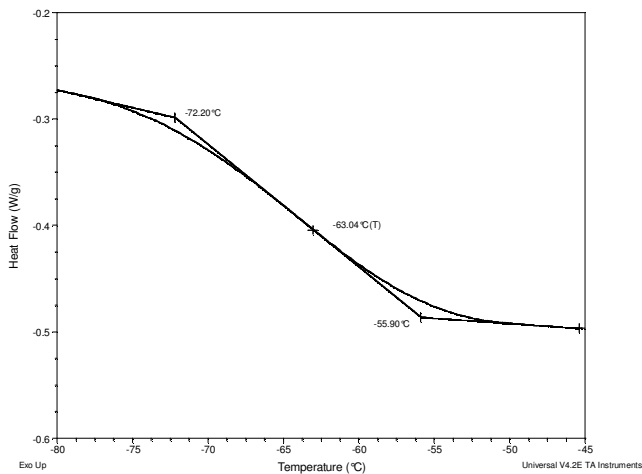
Thermal analysis of the samples was carried out on a TA Q100 differential scanning calorimeter at a heating rate of 20°C/min. The midpoint of the slope change of the heat flow plot of the second heating scan was considered as the glass transition temperature ( $T_g$ ).

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

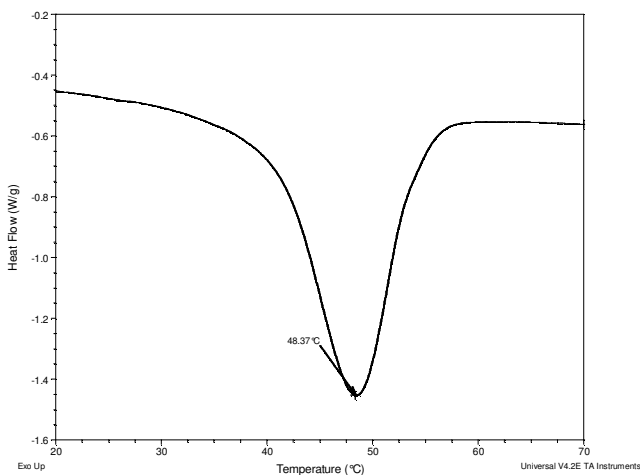
Thermogram for the sample

For PEO block:



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.



For PS block

