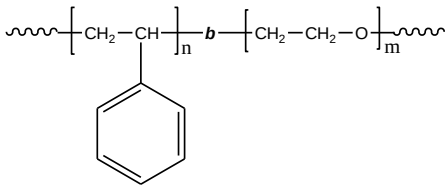
Sample Name: **Poly (styrene-b-ethylene oxide)**

Sample #: **P11216C-SEO**

Structure:



Composition:

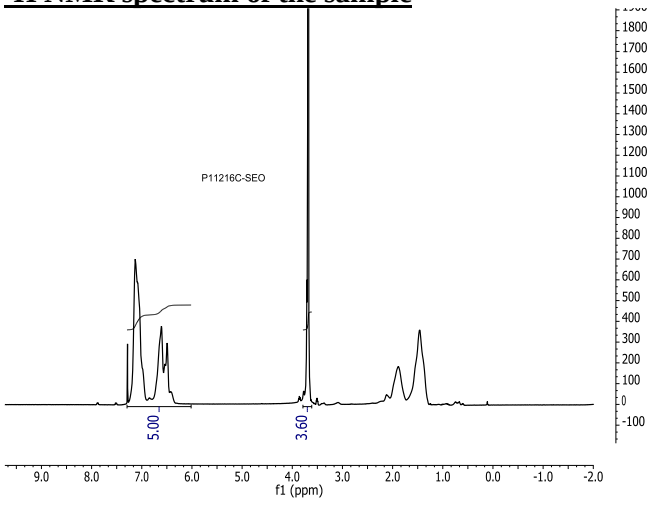
Mn x 10^3 S-b-EO	PDI
10.0-b-3.5	1.09

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

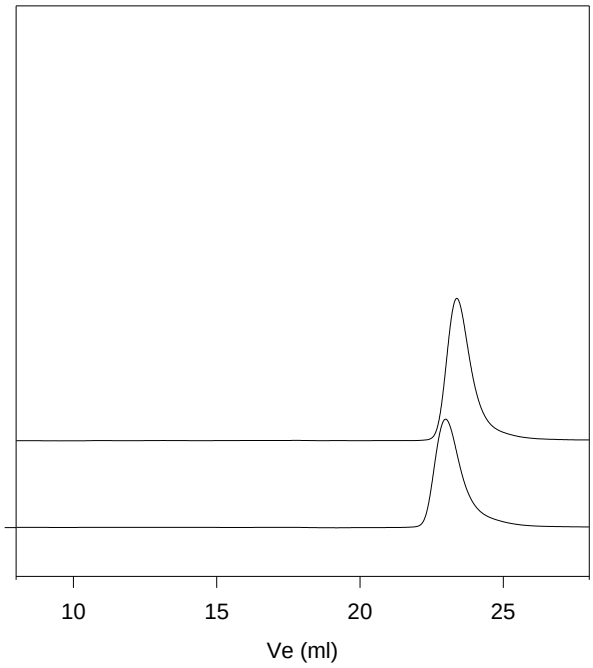
Characterization:
The molecular weight and polydispersity index (PDI) of the block copolymer are characterized by size exclusion chromatography (SEC). The composition of the block copolymer was calculated from ^{1}H-NMR by comparing the peak area of the phenyl polystyrene protons between 6.4 to 7.2 ppm 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
P11216C-SEO



Size exclusion chromatography of poly(styrene-b-ethylene oxide)

Poly(styrene), M_n=10,000, M_w=10,600, PI=1.06
Block Copolymer PSt(10,000)-b-PEO(3,500), PI=1.09
The composition determined from HNMR.

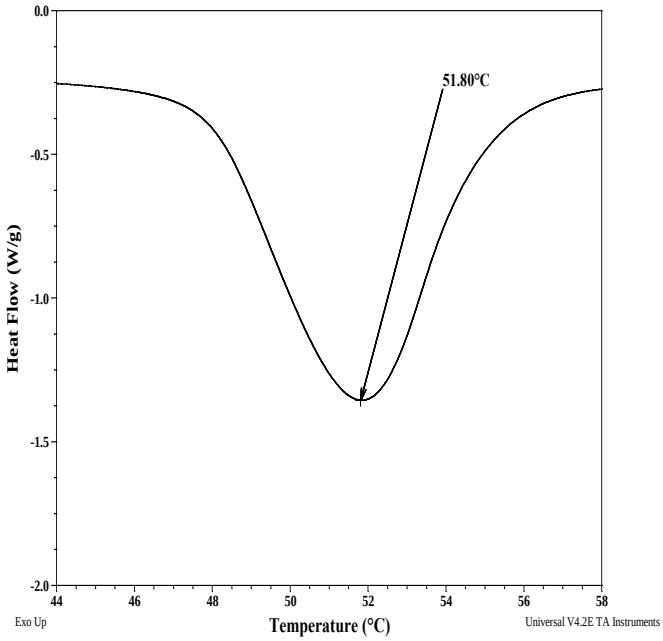
Thermal analysis of the sample# P11216C-SEO

Thermal analysis of the samples was carried out on a TA Q100 differential scanning calorimeter at a heating rate of 10^{o}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).

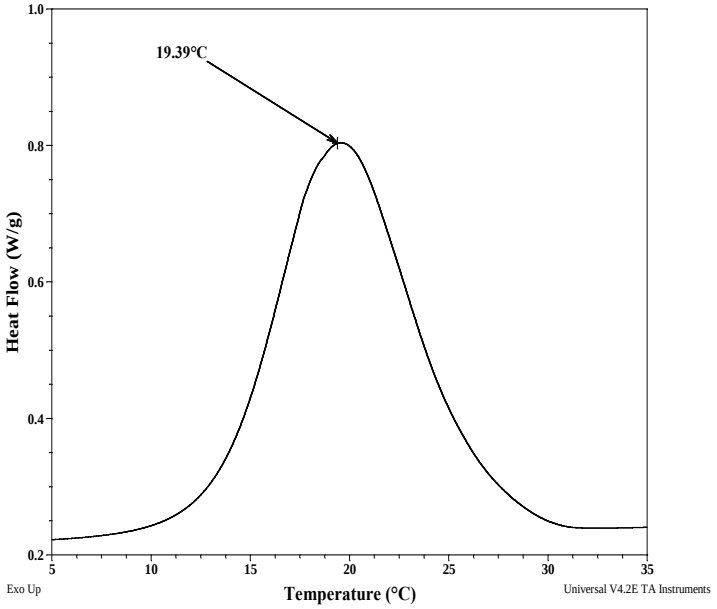
Melting and crystallization curve for the PEO block

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.

Melting curve for PEO block:



Crystallization curve for PEO block:



Thermal analysis results at a glance

For PS block T_g: 82 ^oC		
For PEO block		
T_g: Not distinct	T_m: 52 ^oC	T_c: 19 ^oC

Thermogram for For PS block