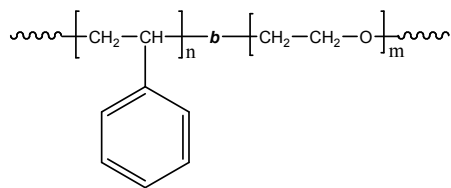


## Sample Name: Poly(styrene-b-ethylene oxide)

**Sample #:** P9077C-SEO

### **Structure:**



### **Composition:**

Mn x 10 <sup>3</sup> S-b-EO	PDI
55.5-b-12.5	1.05

### **Synthesis Procedure:**

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

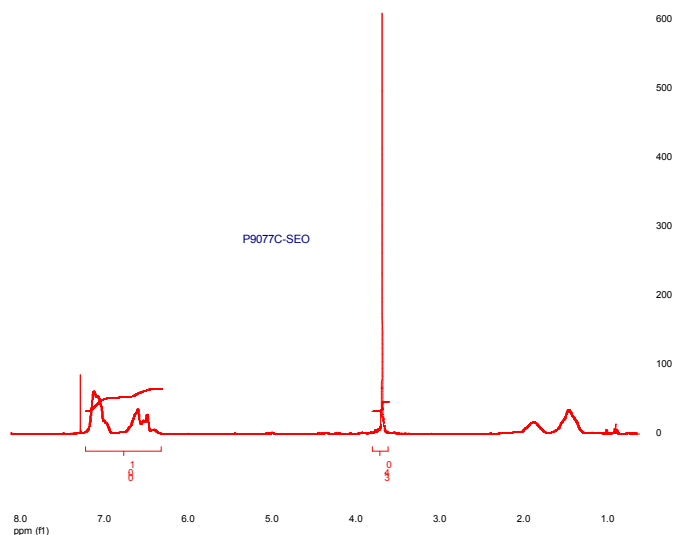
### **Characterization:**

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:**

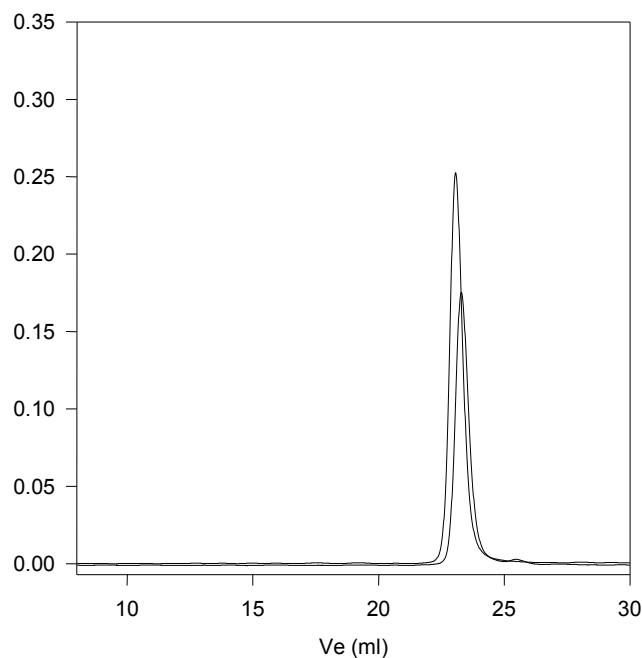
The polymer is soluble in THF (at 35 °C), CHCl<sub>3</sub>, benzene, toluene, dioxane. Low molecular weight SEO with high contents of the polyethylene oxide block can also be solubilized in methanol and water.

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



## SEC profile of the block copolymer

**P9077C-SEO**



Size exclusion chromatography of poly(styrene-b-ethylene oxide contain C13 label ethylene oxide:15%)

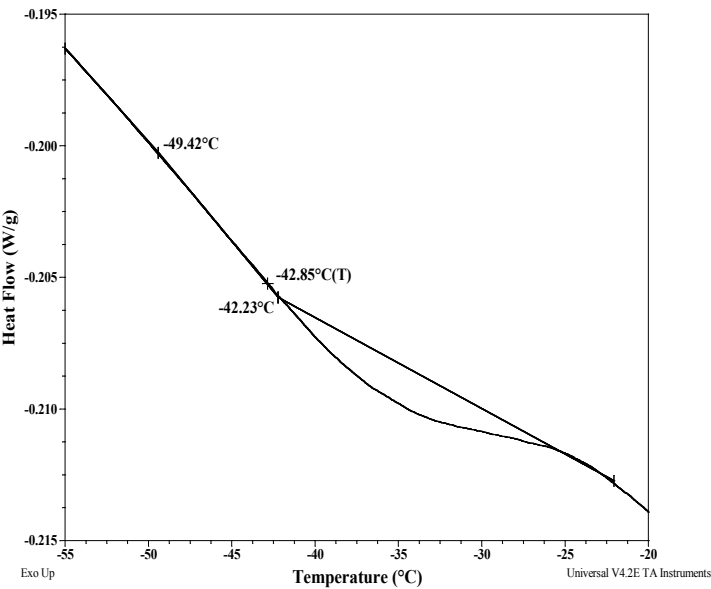
- Poly(styrene), M<sub>n</sub>=55500, M<sub>w</sub>=58400, PI=1.05
  - Block Copolymer PSt(55,500)-b-PEO(12,500), PI=1.05
- Composition from <sup>1</sup>H NMR

Thermal analysis of the sample:

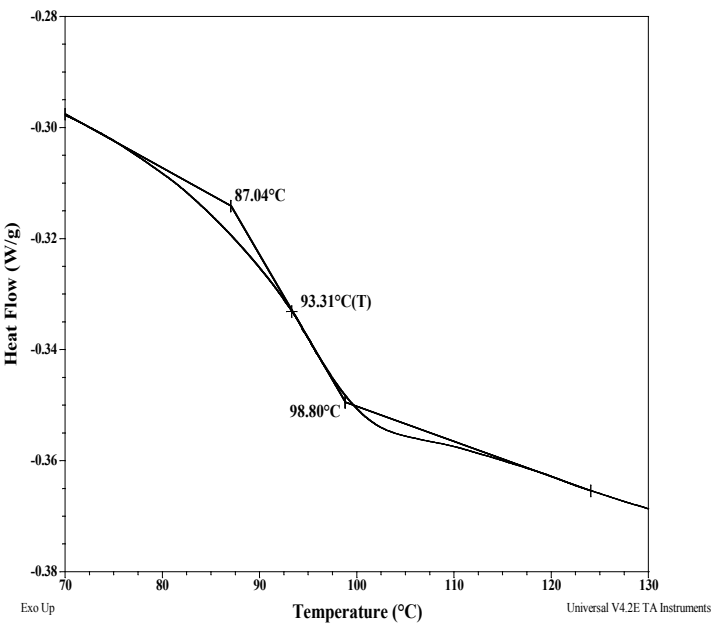
Thermal analysis of the samples was carried out on a TA Q100 differential scanning calorimeter at a heating rate of 20°C/min. The midpoint of the slope change of the heat flow plot of the second heating scan was considered as the glass transition temperature ( $T_g$ ).

Thermogram for the sample

For PEO block:



Thermogram for PS block:

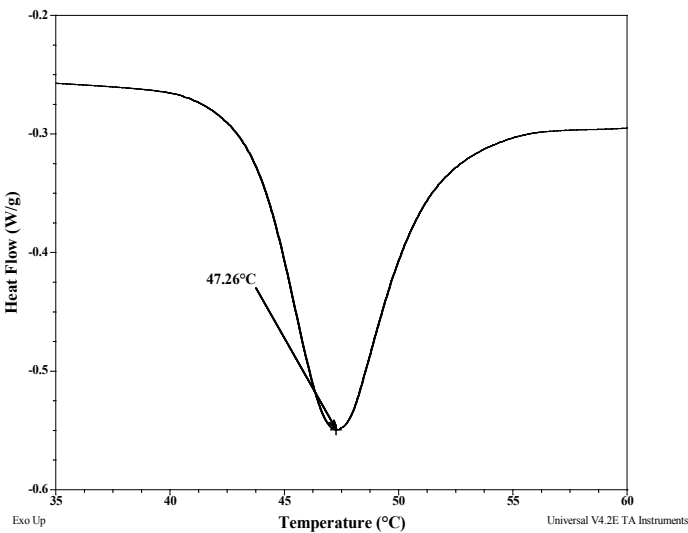


Thermal analysis results at a glance

For PS block $T_g$ : $93^{\circ}\text{C}$		
For PEO block		
$T_g$ : $-43^{\circ}\text{C}$	$T_m$ : $47^{\circ}\text{C}$	$T_c$ : $-33^{\circ}\text{C}$

Melting & crystallization curves 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.



Crystallization curve for the sample:

