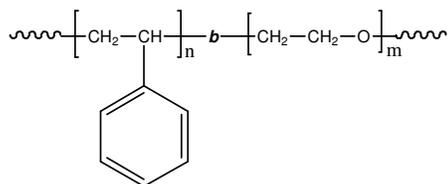


**Sample Name:** Poly(styrene-b-ethylene oxide)

**Sample #:** P15018-SEO

**Structure:**



**Composition:**

| $M_n \times 10^3$<br>S-b-EO | PDI  |
|-----------------------------|------|
| 20.0-b-13.0                 | 1.16 |

**Synthesis Procedure:**

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

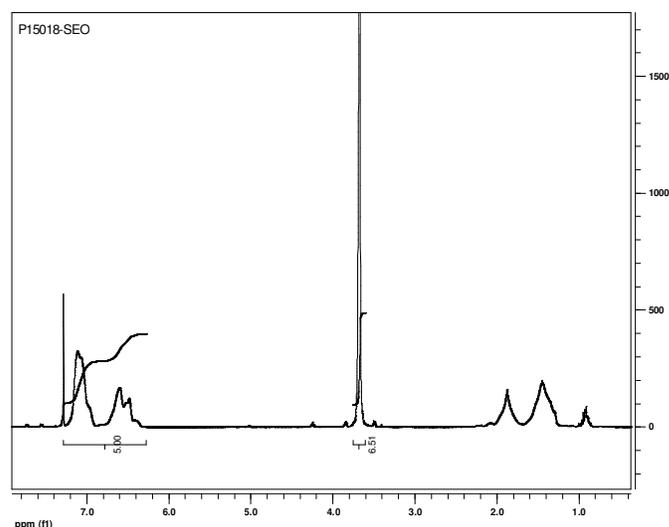
**Characterization:**

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  $^1\text{H-NMR}$  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:**

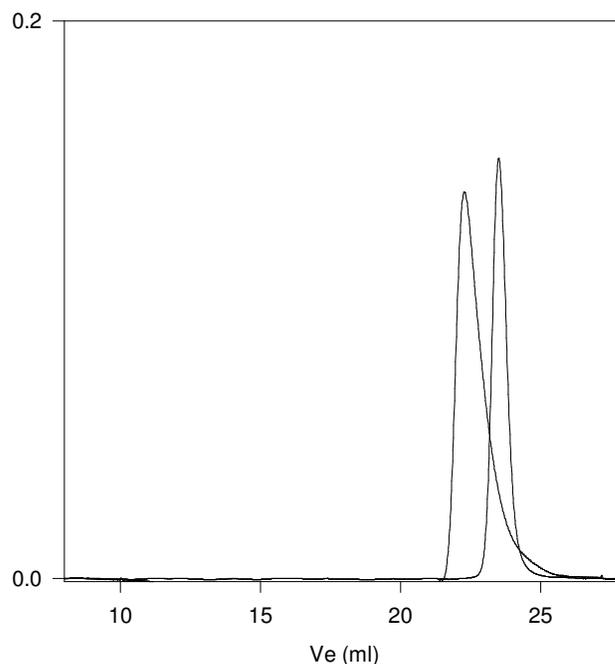
The polymer is soluble in THF (at 35 °C),  $\text{CHCl}_3$ , benzene, toluene, dioxane. Low molecular weight SEO with high contents of the polyethylene oxide block can also be solubilized in methanol and water.

**$^1\text{H NMR}$  spectrum of the sample**



**SEC profile of the block copolymer**

**P15018-SEO**



Size Exclusion Chromatography:

— Polystyrene,  $M_n=20,000$ ,  $M_w=21,000$ ,  $PI=1.05$

— Block Copolymer Polystyrene-b-Poly(ethylene oxide)

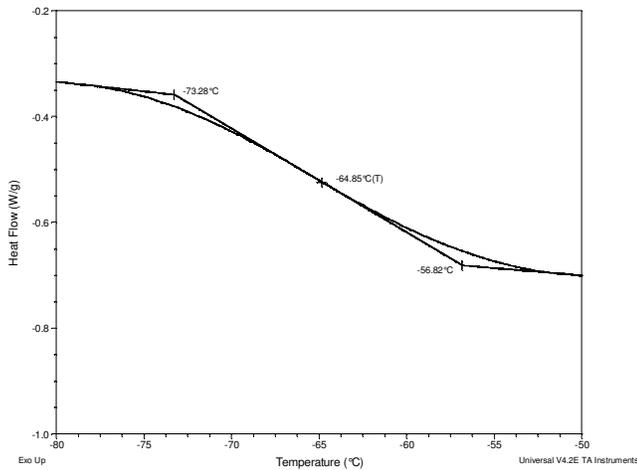
$M_w$ : PS(20,000)-b-PEO(13,000),  $PI=1.16$

## Thermal analysis of the sample# P15018-SEO

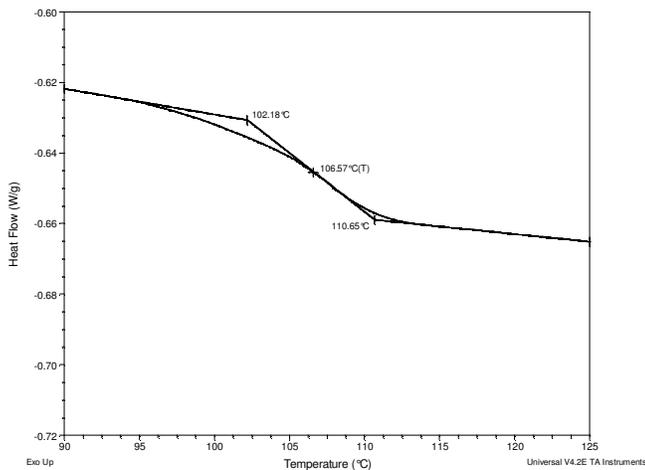
Thermal analysis of the samples was carried out on a TA Q100 differential scanning calorimeter at a heating rate of 20°C/min. The midpoint of the slope change of the heat flow plot of the second heating scan was considered as the glass transition temperature ( $T_g$ ).

### Thermogram for the sample

#### For PEO block:



#### For PS block



## Thermal analysis results at a glance

|   |              |              |
|---|--------------|--------------|
| <b>For PS block <math>T_g</math>: 107°C</b> |              |              |
| <b>For PEO block</b>                        |              |              |
| $T_g$ : -65°C                               | $T_m$ : 63°C | $T_c$ : 43°C |

### Melting and crystallization curve for the PEO block

The melting temperature ( $T_m$ ) was taken as the maximum of the endothermic peak whereas the crystallization temperature ( $T_c$ ) was considered as the minimum of the exothermic peak.

