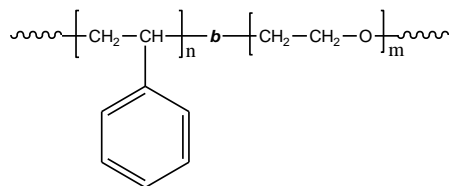


Sample Name: **Poly(styrene-b-ethylene oxide)**

Sample #: **P9628-SEO**

Structure:



Composition:

| | |
|-----------------------------|------|
| $M_n \times 10^3$ S-b-EO | PDI |
| 16.4-110.0 | 1.08 |

Synthesis Procedure:

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

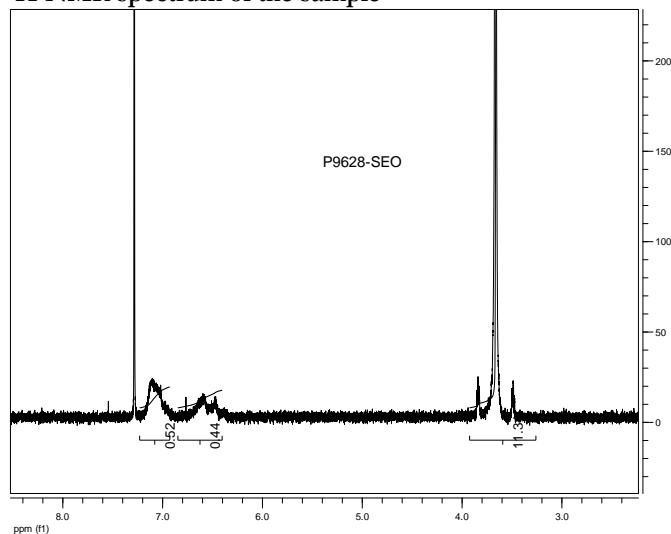
Characterization:

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 ^1H -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:

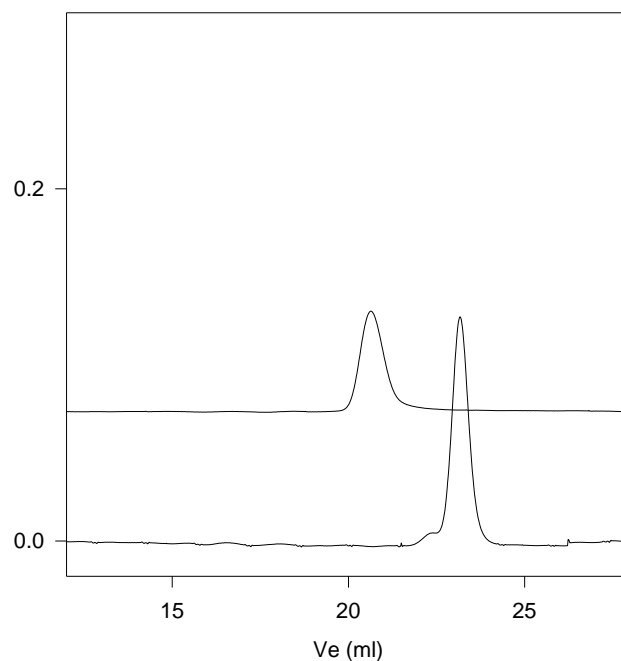
The polymer is soluble in THF (at 35 °C), CHCl_3 , benzene, toluene, dioxane. Low molecular weight SEO with high contents of the polyethylene oxide block can also be solubilized in methanol and water.

^1H NMR spectrum of the sample



SEC profile of the block copolymer

P9628-SEO



Size Exclusion Chromatography:

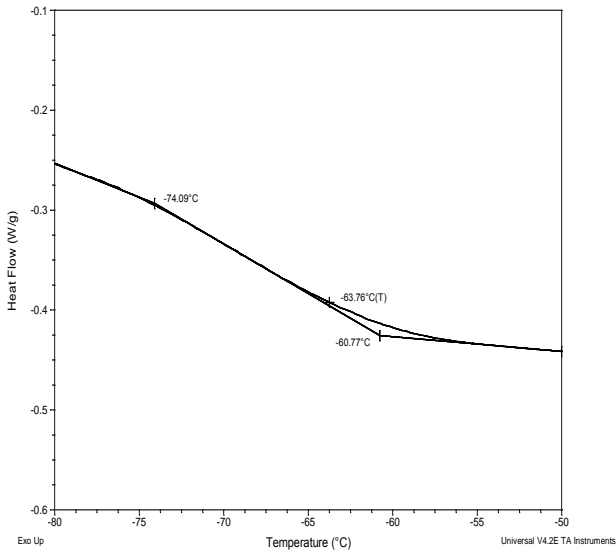
- Polystyrene, $M_n=16400$, $M_w=17200$, $PI=1.05$
 - Block Copolymer Polystyrene-b-Poly(ethylene oxide)
- MW: PS(16400)-b-PEO(110,000), $PI=1.08$

Thermal analysis of the sample# P9628-SEO

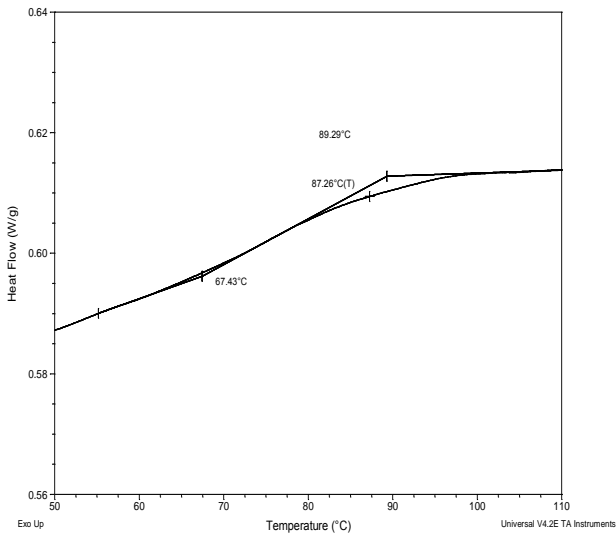
Thermal analysis of the samples was carried out on a TA Q100 differential scanning calorimeter at a heating rate of 20°C/min. The midpoint of the slope change of the heat flow plot of the second heating scan was considered as the glass transition temperature (T_g).

Thermogram for the sample

For PEO block:



For PS block



Thermal analysis results at a glance

| For PS block T_g : 87°C | | |
|---------------------------|--------------|--------------|
| For PEO block | | |
| T_g : -64°C | T_m : 64°C | T_c : 40°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.

