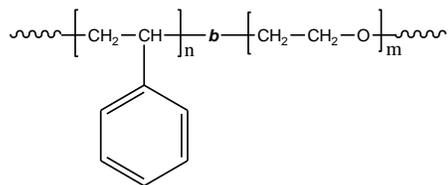


Sample Name: Poly(styrene-b-ethylene oxide)

Sample #: P5874-SEO

Structure:



Composition:

$M_n \times 10^3$ S-b-EO	PDI
90.0-b-45.0	1.14

Synthesis Procedure:

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

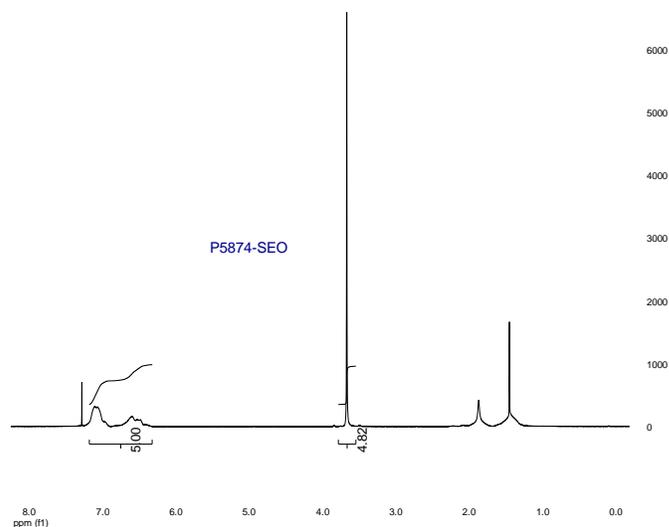
Characterization:

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:

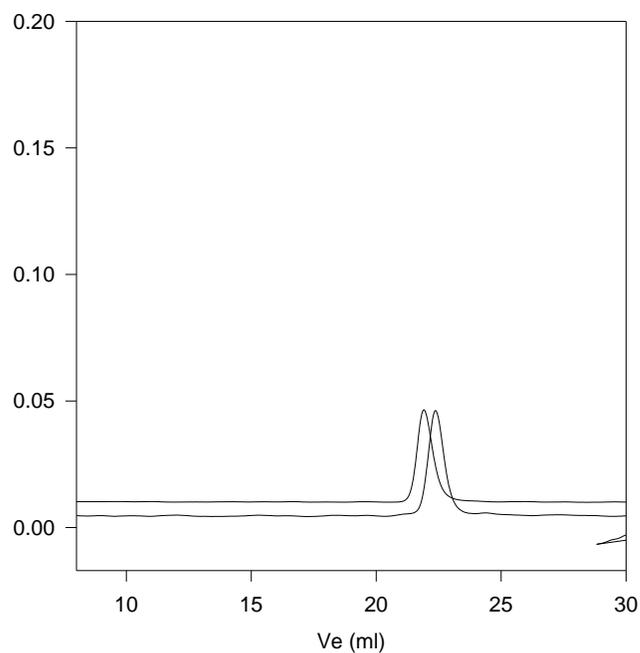
The polymer is soluble in THF (at 35 °C), CHCl_3 , benzene, toluene, dioxane. Low molecular weight SEO with high contents of the polyethylene oxide block can also be solubilized in methanol and water.

^1H NMR spectrum of the sample



SEC profile of the block copolymer

P5874-SEO



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

— Poly(styrene), $M_n=90,000$, $M_w=97,000$, $PI=1.08$

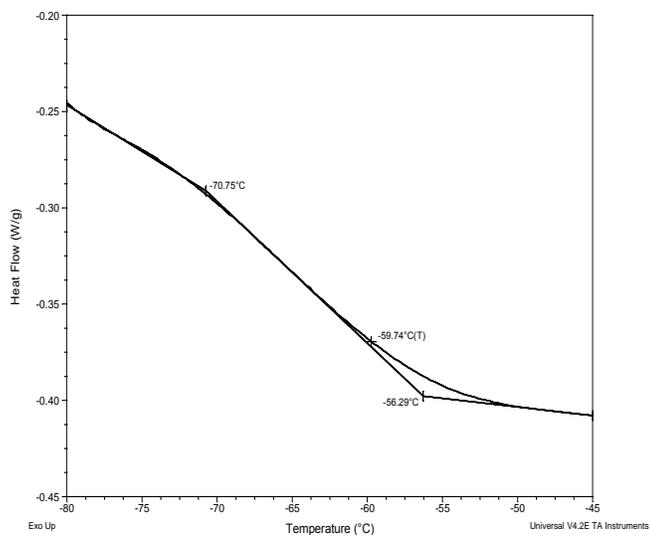
— Block Copolymer PSt(90,000)-b-PEO(45000), $PI=1.14$
Composition from ^1H NMR

Thermal analysis of the sample# P5874-SEO

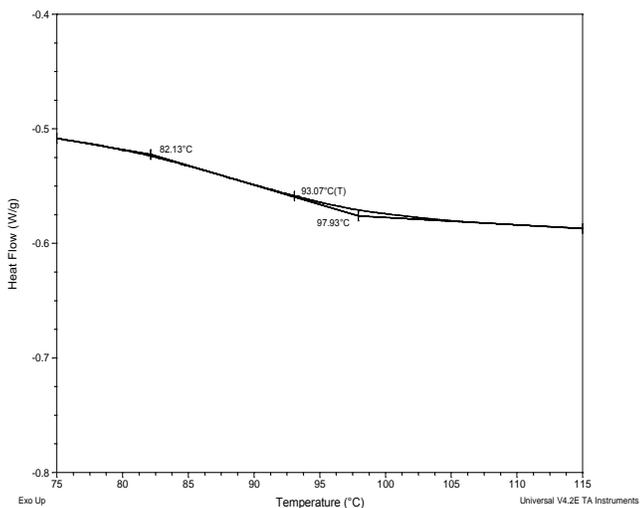
Thermal analysis of the samples was carried out on a TA Q100 differential scanning calorimeter at a heating rate of 20°C/min. The midpoint of the slope change of the heat flow plot of the second heating scan was considered as the glass transition temperature (T_g).

Thermogram for the sample

For PEO block:



For PS block



Thermal analysis results at a glance

For PS block $T_g: 93^\circ\text{C}$		
For PEO block		
$T_g: -60^\circ\text{C}$	$T_m: 54^\circ\text{C}$	$T_c: -34^\circ\text{C}$

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.

