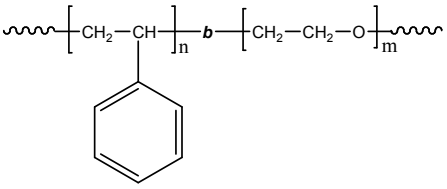
Sample Name: Poly(styrene-b-ethylene oxide)

Sample #: P9077B-SEO

Structure:



Composition:

Mn x 10^3 S-b-EO	PDI
55.5-b-13.0	1.05

Synthesis Procedure:

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

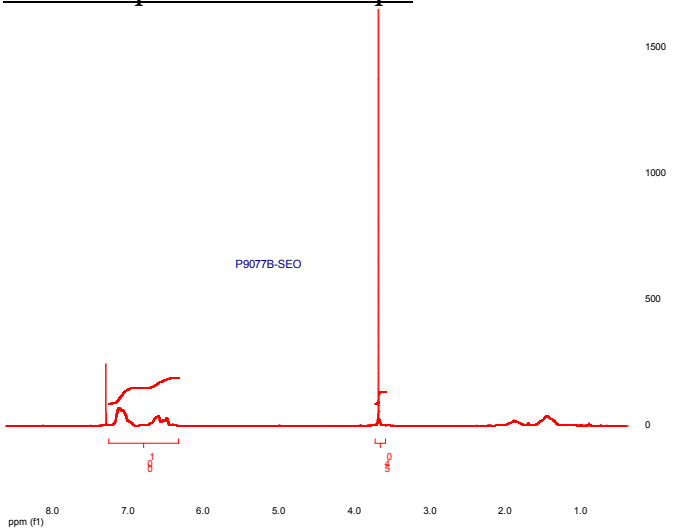
Characterization:

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 ^{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:

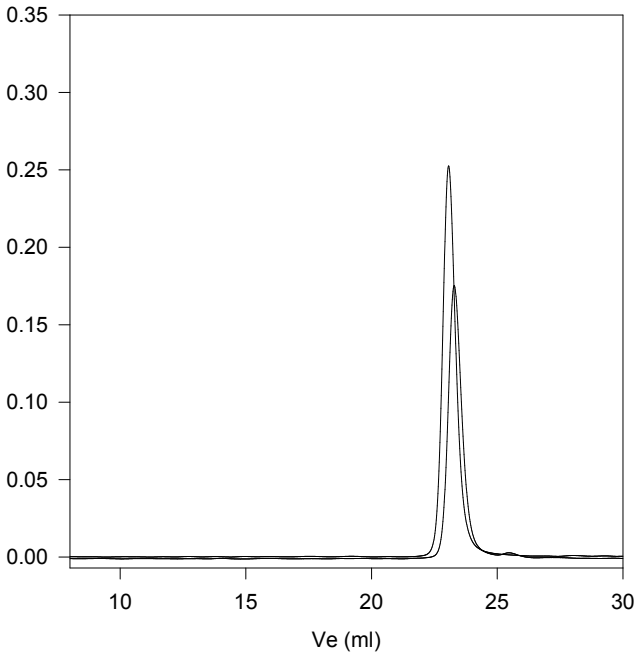
The polymer is soluble in THF (at 35 °C), $CHCl_3$, benzene, toluene, dioxane. Low molecular weight SEO with high contents of the polyethylene oxide block can also be solubilized in methanol and water.

^{1}H NMR spectrum of the sample



SEC profile of the block copolymer

P9077B-SEO



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

—— Poly(styrene), M_n=55500, M_w=58400, PI=1.05

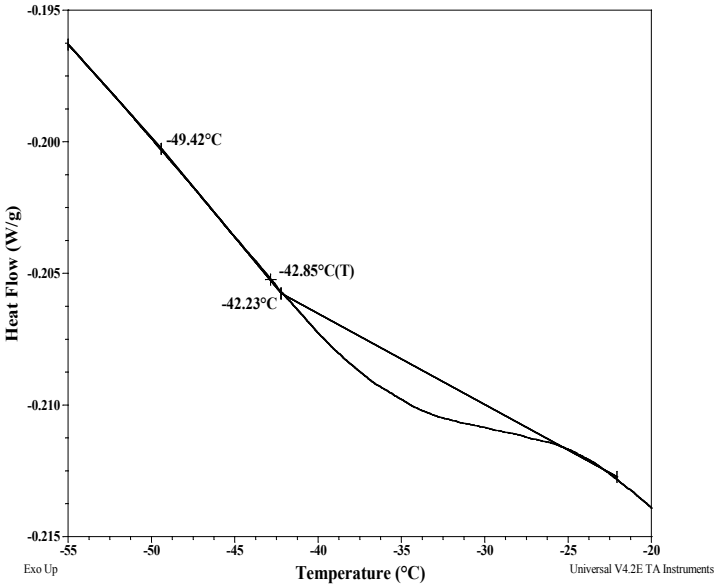
—— Block Copolymer PSt(55000)-b-PEO(13000), PI=1.05
Composition from ^{H} NMR

Thermal analysis of the sample:

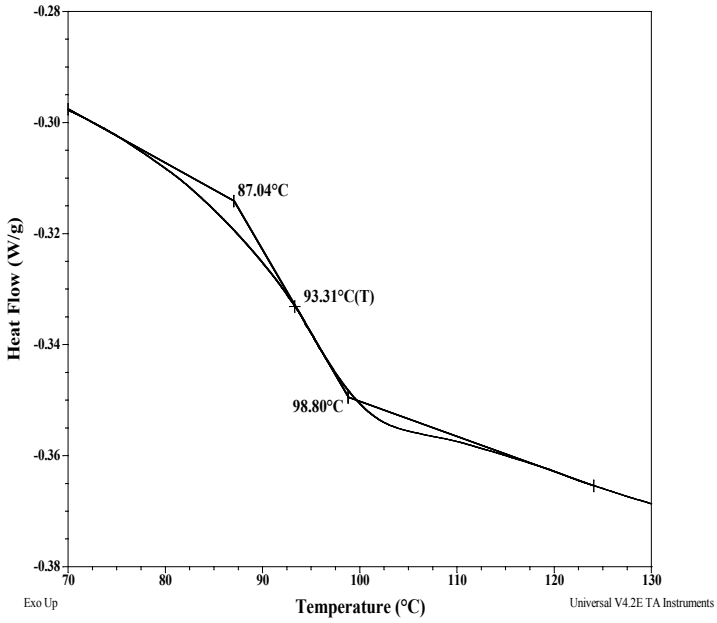
Thermal analysis of the samples was carried out on a TA Q100 differential scanning calorimeter at a heating rate of 20^{o}C/min.The midpoint of the slope change of the heat flow plot of the second heating scan was considered as the glass transition temperature (T_g).

Thermogram for the sample

For PEO block:



Thermogram for PS block:

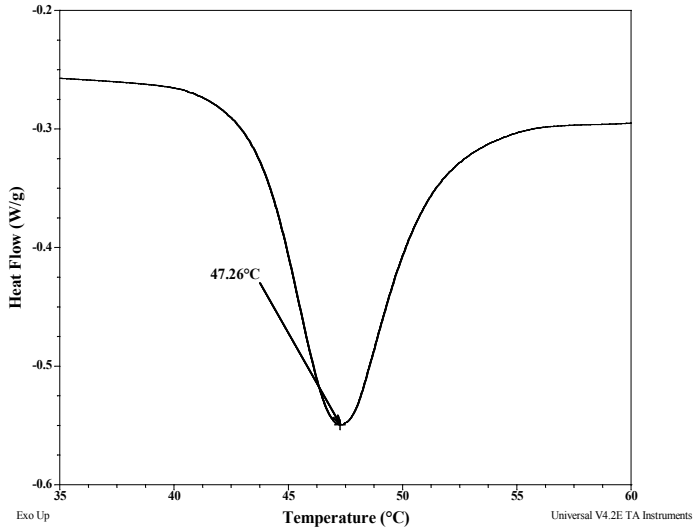


Thermal analysis results at a glance

For PS block T_g: 93^{o}C		
For PEO block		
T_g: -43^{o}C	T_m: 47^{o}C	T_c: -33^{o}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: