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

Sample #: P5875-SEO

Structure:

Composition:

Mn x 10³ S-b-EO	PDI
35.0-b-17.0	1.10

Synthesis Procedure:

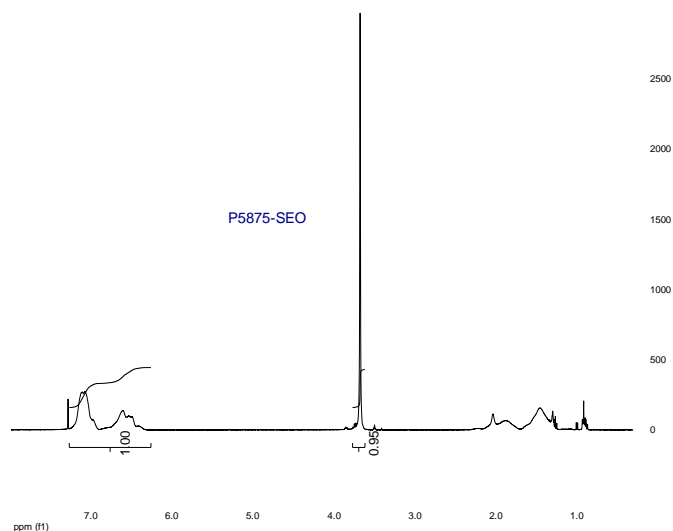Poly(styrene-b-ethylene oxide) diblock copolymer is prepared by living anionic polymerization.

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.
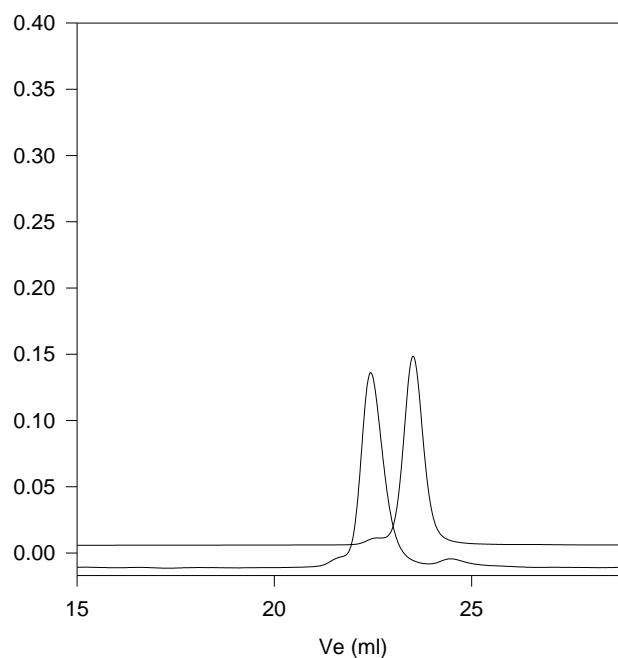
Solubility:

 The polymer is soluble in THF (at 35 °C), CHCl₃, 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

P5875-SEO

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

—— Poly(styrene), M$_n$=35000, M$_w$=37000, PI=1.06

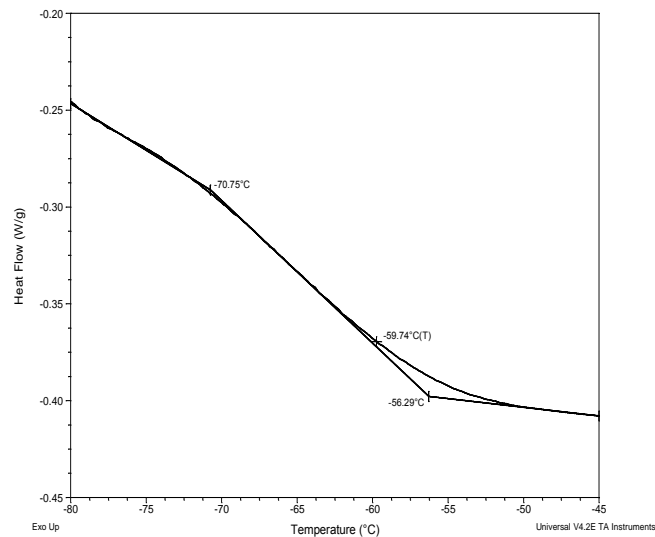—— Block Copolymer PSt(35000)-b-PEO(17000), PI=1.10
Composition from ^{H} NMR
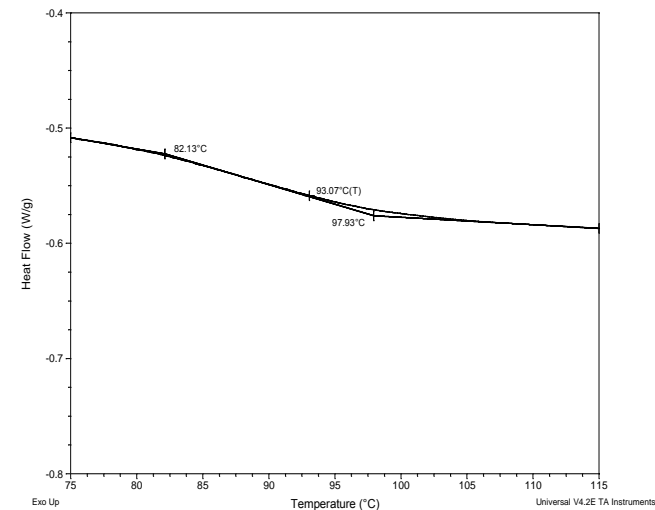
Thermal analysis of the sample# P5875-SEO

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°C		
For PEO block		
T_g: -60°C	T_m: 54°C	T_c: -34°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.