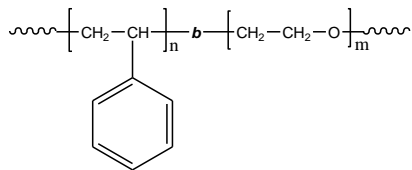


**Sample Name:** Poly(styrene-b-ethylene oxide)

**Sample #:** P18728-SEO

**Structure:**



**Composition:**

$M_n \times 10^3$ S-b-EO	PDI
20.5-b-6.5	1.05

**Synthesis Procedure:**

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

**Characterization:**

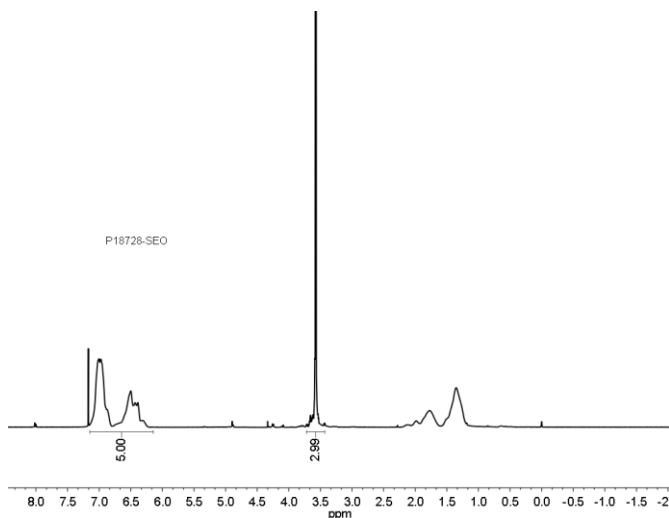
The molecular weight and polydispersity index (PDI) of the block copolymer are characterized by size exclusion chromatography (SEC). The composition of the block copolymer was calculated from  $^1H$ -NMR by comparing the peak area of the phenyl polystyrene protons between 6.4 to 7.2 ppm and the ethylene 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**

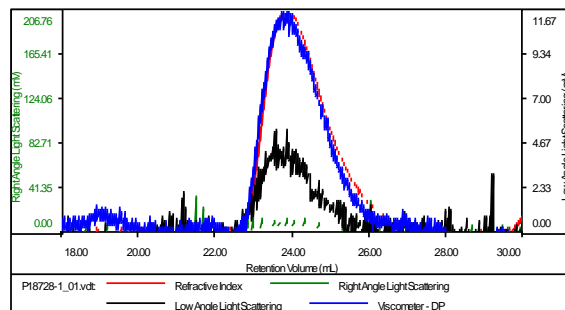
S-b-EO



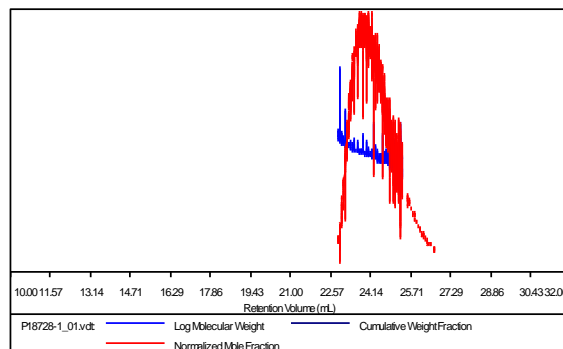
**SEC profile of the block copolymer**

**Sample ID:** P18728-SOH

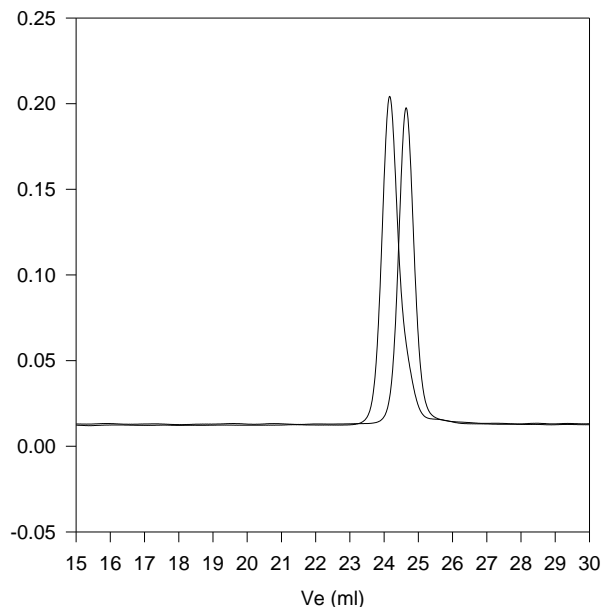
Concentration (mg/mL)	2.0209
Sample ch/d: (mL/g)	0.1850
Method File	PS80K-Apr15-2014-0000.vcm
Column Set	3x PL 1113-6300
Solvent	THF



Sample	$M_n$	$M_w$	$M_p$	$M_w/M_n$	IV
P18728-1_01.vcl	20,584	21,869	22,702	1.062	0.0798



**P18728-SEO**



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

— Poly(styrene),  $M_n=20,500$ ,  $PI=1.06$

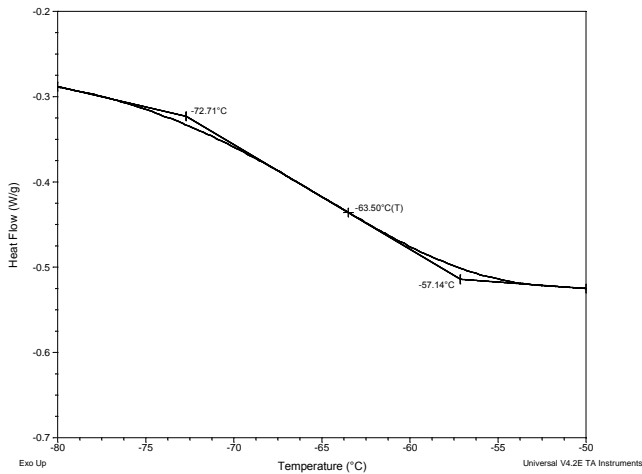
— Block Copolymer PSt(20,500)-b-PEO(6,500),  $PI=1.05$

Thermal analysis of the sample# P18728-SEO

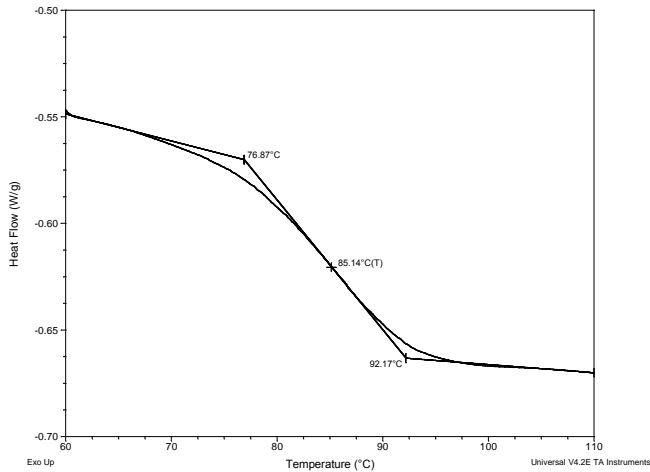
Thermal analysis of the samples was carried out on a TA Q100 differential scanning calorimeter at a heating rate of 20°C/min. The midpoint of the slope change of the heat flow plot of the second heating scan was considered as the glass transition temperature ( $T_g$ ).

Thermogram for the sample

For PEO block:



For PS block



Thermal analysis results at a glance

For PS block $T_g$ : 85°C		
For PEO block		
$T_g$ : -63°C	$T_m$ : 37°C	$T_c$ : -18 & -45°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.

