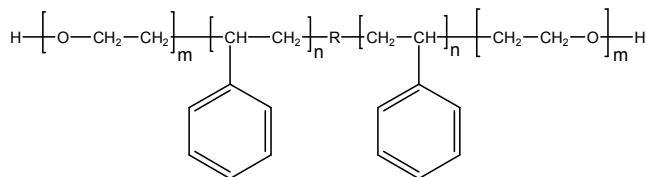


### Sample Name:

Poly(ethylene oxide-b-styrene-b-ethylene oxide)

Sample #: P3711-EOSEO

Structure:

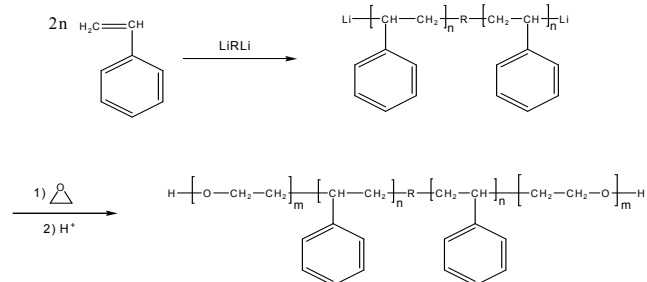


Composition:

$M_n \times 10^3$ EO-b-S-b-EO	PDI
4.2-7.0-4.2	1.03

### Synthesis Procedure:

Poly(ethylene oxide-b-styrene-b-ethylene oxide) is prepared by living anionic polymerization with sequence addition of styrene followed by ethylene oxide. The scheme of the reaction is illustrated below:



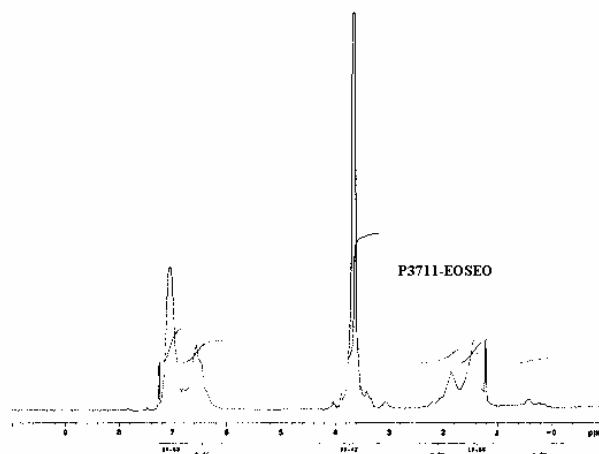
### Characterization:

Polymer analyzed by size exclusion chromatography (SEC) to obtain the molecular weight and polydispersity index (PDI). The composition of the block copolymers was calculated by taking the ratio of the peak area of aromatic protons at 6.4-7.2 ppm to that of ethylene protons from PEO at 3.65 ppm. The molecular weight of PEO was then calculated from this composition and the molecular weight of PS obtained by SEC.

### Solubility:

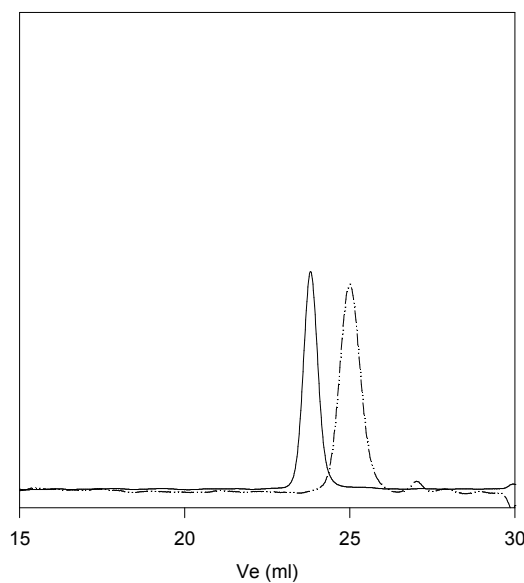
The polymer is soluble in THF, toluene, and  $\text{CHCl}_3$ . The triblock copolymer can also be solubilized in methanol, ethanol depending on its composition. The polymer readily precipitates from hexanes, ether and water.

$^1\text{H}$ NMR of the polymer:



SEC of Sample:

P3711-EOSEO



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

..... Poly(styrene),  $M_n=7000$ ,  $M_w=7500$ ,  $PI=1.07$

—— Block Copolymer PEO(4200)-b-St(7000)-b-PEO(4200),  $PI=1.03$   
Dp of each block: PEO(95)-b-PSt(67)-b-PEO(95)

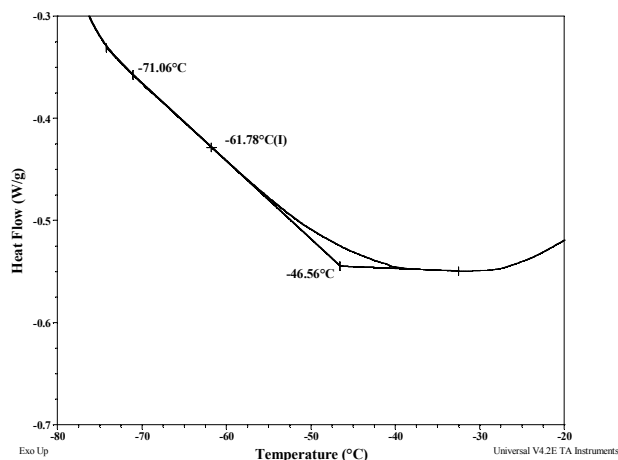
## Thermal analysis of the sample# P3711-EOSEO

Thermal analysis of the samples was carried out on a TA Q100 differential scanning calorimeter at a heating rate of 10°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 ( $T_g$ ).

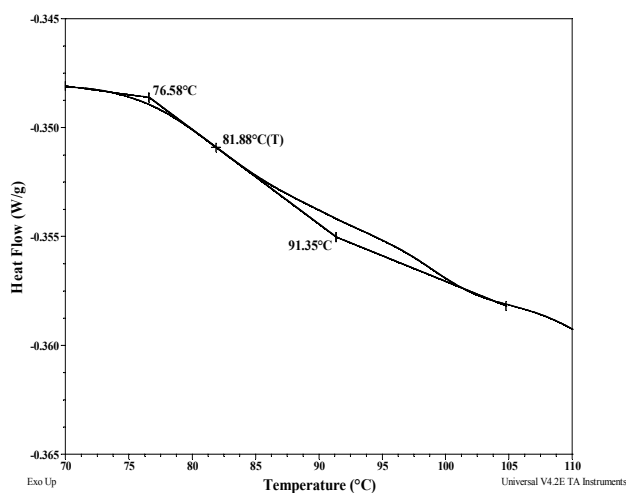
### Thermal analysis results at a glance (EO-S-EO)

Sample	$T_m$ (°C)	$T_c$ (°C)	$T_g$ (°C)
EO block	50	-27	-62
PS block		-	82

### Typical thermogram for the EO block



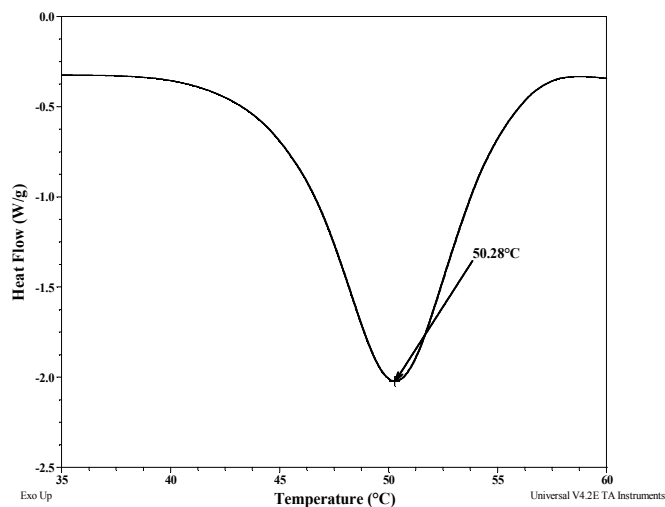
### Thermogram for PS block:



## Melting and crystallization curve for the sample

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.

### Melting curve for PEO block:



### Crystallization curve for PEO block:

