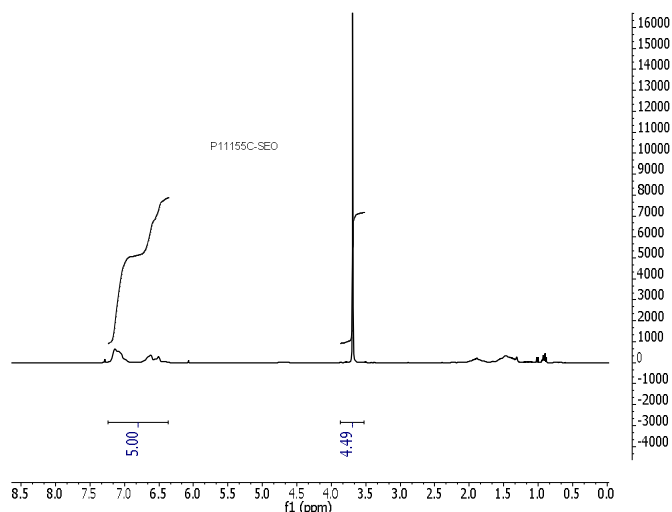


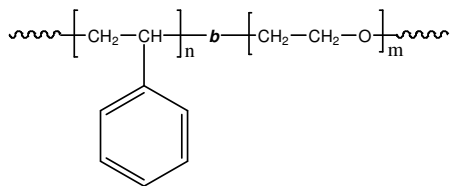
¹H NMR spectrum of the sample



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

Sample #: **P11155C-SEO**

Structure:



Composition:

| | |
|--------------------------------|------|
| Mn x 10 ³ S-b-EO | PDI |
| 20.5-b-9.5 | 1.05 |

Synthesis Procedure:

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

Characterization:

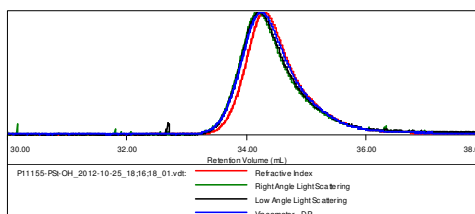
The molecular weight and polydispersity index (PDI) of the block copolymer are characterized by size exclusion chromatography (SEC). The composition of the block copolymer was calculated from ¹H-NMR by comparing the peak area of the phenyl polystyrene protons between 6.4 to 7.2 ppm and the ethylene oxide protons at 3.65 ppm.

Solubility:

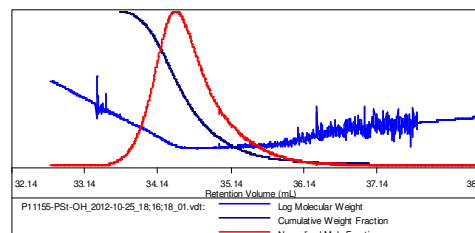
The polymer is soluble in THF (at 35 °C), CHCl₃, benzene, toluene, dioxane. Low molecular weight SEO with high contents of the polyethylene oxide block can also be solubilized in methanol and water.

Sample ID: P11155-PS-OH

| | |
|-----------------------|-------------------------|
| Concentration (mg/mL) | 9.0852 |
| Sample dn/dc (mL/g) | 0.1850 |
| Method File | PS80K-Oct-2012-0002.vcm |
| Column Set | 3x PL 1113-6300 |
| System | System 1 |

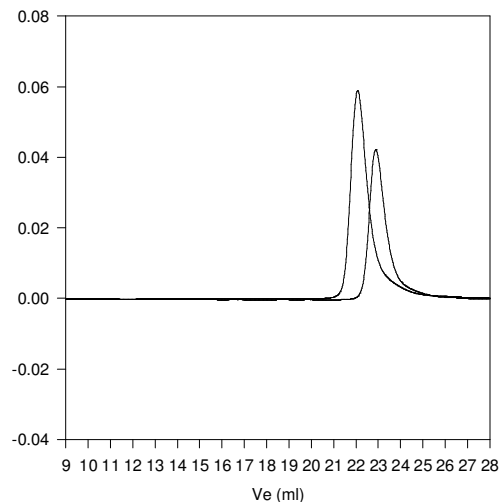


| Sample | Mn (Da) | Mw (Da) | Mp (Da) | Mw/Mn | IV (dL/g) |
|--|---------|---------|---------|-------|-----------|
| P11155-PS-OH_2012-10-25_18;16;18_01.vd | 20,538 | 21,761 | 19,890 | 1.060 | 0.2138 |



SEC profile of the block copolymer:

P11155C-SEO



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

— Poly(styrene), M_n=20,500, M_w=21100, PI=1.06

— Block Copolymer PSt(20,500)-b-PEO(9,500), PI=1.05

Thermal analysis of the sample# P11155C-SEO

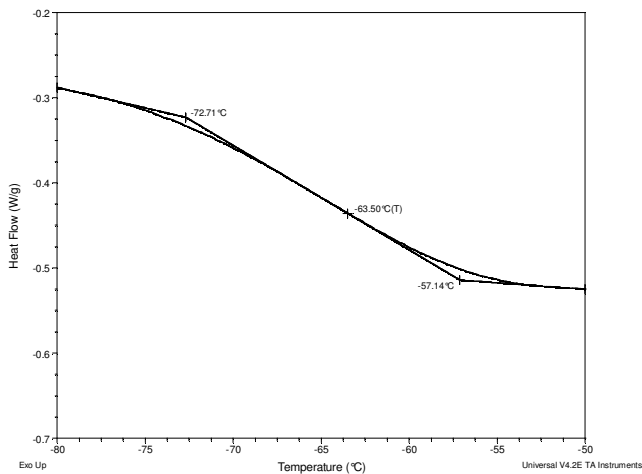
Thermal analysis of the samples was carried out on a TA Q100 differential scanning calorimeter at a heating rate of 20°C/min. The midpoint of the slope change of the heat flow plot of the second heating scan was considered as the glass transition temperature (T_g).

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 |

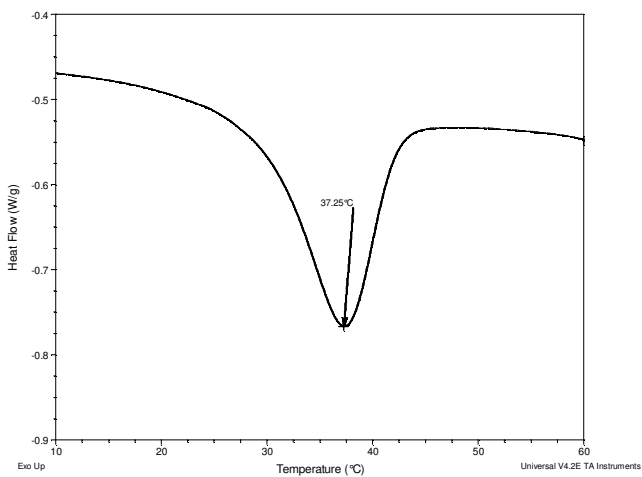
Thermogram for the sample

For PEO block:



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.



For PS block

