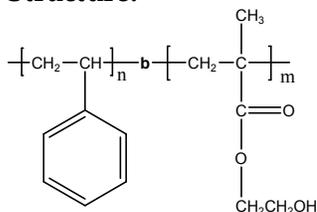


Sample Name:Poly(styrene-*b*-hydroxyethyl methacrylate)**Sample #:** P13133-SHEMA**Structure:****Composition:**

| | |
|---|-------------|
| Mn × 10 ³ S- <i>b</i> -HEMA | Mw/Mn (PDI) |
| 7.0- <i>b</i> -24.0 | 1.25 |

Glass transition temperature at a glance

| | |
|-------------------------------|--------------|
| T _g for PS block | Not distinct |
| T _g for HEMA block | 109 °C |

Synthesis Procedure:

Poly(styrene-*b*-hydroxy ethyl methacrylate) is prepared by living anionic polymerization by sequence addition of styrene followed by trimethylsiloxy ethyl methacrylate (HEMA-TMS) and deprotection of the OH group.

Characterization:

An aliquot of the polystyrene block was terminated before addition of trimethylsiloxy ethyl methacrylate and analyzed by size exclusion chromatography (SEC) to obtain the molecular weight and polydispersity index (PDI).

SEC analysis of the obtained block copolymer in THF in presence of triethyl amine as eluent resulting in an ambiguity of the result because some of the trimethylsiloxy ethyl methacrylate units are deprotected to convert hydroxy ethyl methacrylate.

The SEC analysis of the final polymer is carried out after protecting OH groups of hydroxy ethyl methacrylate to acetate group was treated with acetic anhydride in presence of pyridine. The SEC analysis of the obtained polymer gives more reliable results.

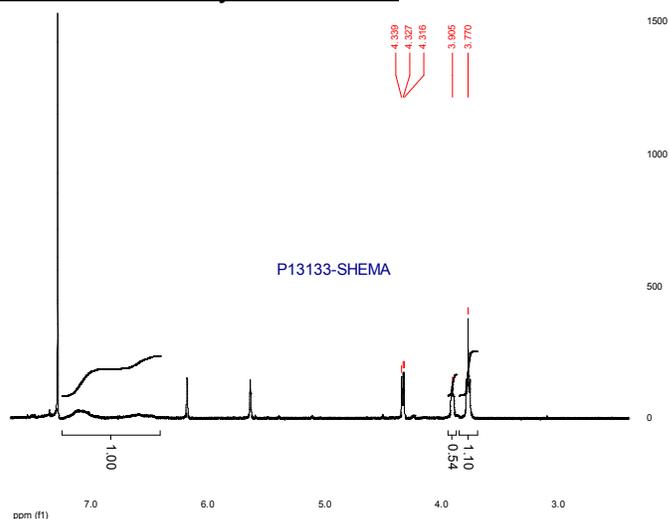
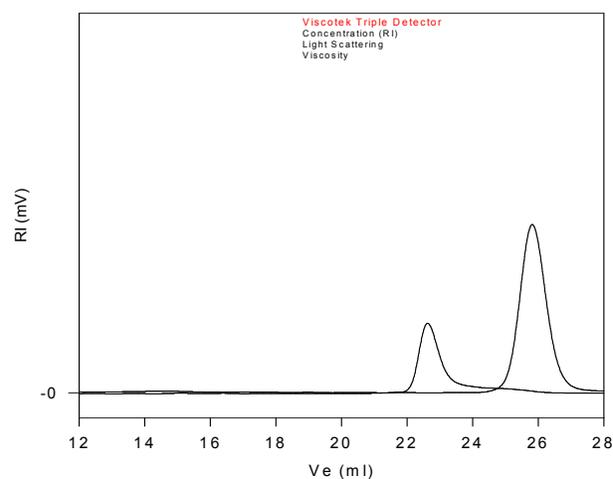
The final block copolymer composition by ¹H-NMR spectroscopy in CdCl₃ also yield the uncertainty of the analysis because of poor solubility of poly HEMA block in CdCl₃. The composition of the obtained polymer therefore, carried out in CdCl₃ after protecting the OH group with acetic anhydride by comparing the peak area of the styrene protons at 6.3-7.2 ppm with the peak area of ethyl methacrylate at 4.2-4.17 ppm. Block copolymer PDI is determined by SEC.

Thermal analysis:

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).

Solubility:

Poly(styrene-*b*-hydroxyethyl methacrylate) is soluble in DMF, and precipitated into hexanes.

HNMR of the Polymer in DMF**SEC profile of the block copolymer****P 13133-SHEMA**

Size Exclusion Chromatography of the product
PS Mn : 7000 Mw/Mn 1.10

— PS-*b*-PHEMA-TMS: M_n = 7000-*b*- 37500 Mw/Mn = 1.25
After deprotection of OH: PS-*b*-HEMA: 7000-*b*-24000

Thermogram for PS block: