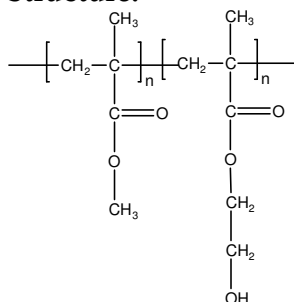


**Sample Name:**

Poly( methylmethacrylate-b-2-hydroxy ethyl methacrylate)

**Sample #:** P13152-MMAHEMA

**Structure:****Composition:**

$M_n \times 10^3$ MMA-b-HEMA	PDI
24.0-b-16.0	1.18
$T_g$ for MMA block: 128°C	$T_g$ for HEMA block: NF

**Synthesis Procedure:**

Poly(Methyl methacrylate-b-2-hydroxy ethyl methacrylate) block copolymer is synthesized by living anionic polymerization with sequence addition of methyl methacrylate followed by addition of protecting hydroxyl HEMA (trimethyl siloxy ethyl methacrylate monomer). The obtained polymer was precipitated in methanol/acidic to deprotect the hydroxyl group.

**Characterization:**

SEC analysis of the obtained block copolymer in THF in presence of triethyl amine as an 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.

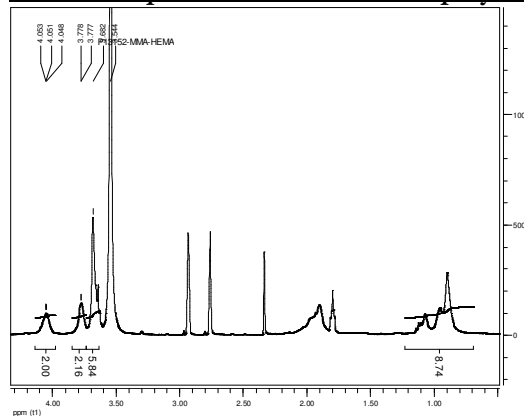
The final block copolymer composition by  $^1\text{H-NMR}$  spectroscopy in  $\text{CdCl}_3$  also yields the uncertainty of the analysis because of poor solubility of poly HEMA block in  $\text{CdCl}_3$ . The composition of the obtained polymer is, therefore, carried out in  $\text{CdCl}_3$  after protecting the OH group with acetic anhydride by comparing the peak area of the methyl ester protons at 3.6 ppm with the peak area of ethyl methacrylate at 4.2-4.17 ppm. Block copolymer PDI is determined by SEC.

**Thermal analysis:**

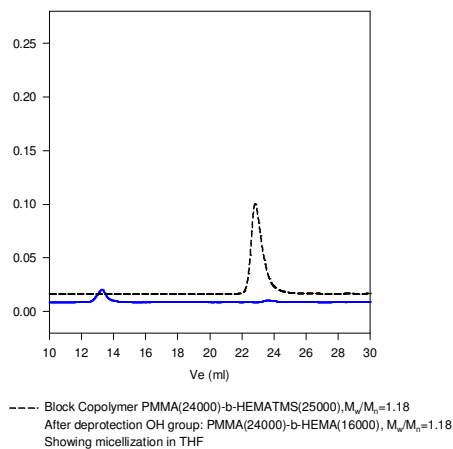
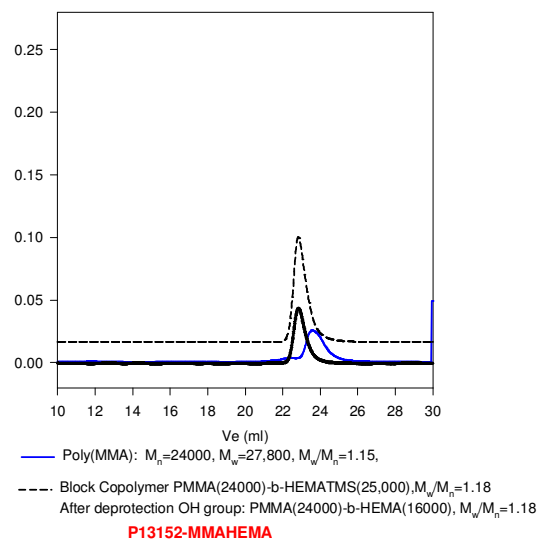
Thermal analysis of the samples was carried out on a TA Q100 differential scanning calorimeter at a heating rate of 10°C/min. The midpoint of the slope change of the heat flow plot of the second heating scan was considered as the glass transition temperature ( $T_g$ ).

**Solubility:**

The polymer is soluble in DMF.

 **$^1\text{H-NMR}$  Spectrum of the block copolymer in DMF****SEC of the block copolymer:**

**P13152-MMAHEMA**

**DSC thermogram for MMA block:**