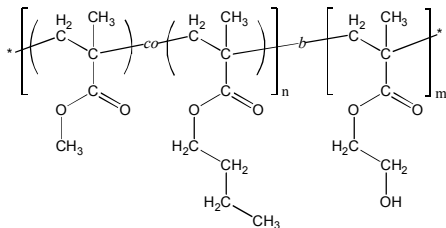


Sample Name:

Poly(methyl methacrylate-*co*_(random)-n-butyl methacrylate)-*block*-poly(2-hydroxyethyl methacrylate)

Sample #: P10793p-MMA_nBuMA_ran-b-HEMA

Structure:

**Composition:**

$M_n \times 10^3$ (g/mol)	19.0- <i>b</i> -17.0
M_w/M_n	1.15
Molar ratio MMA : nBuMA	50 : 50 (mol/mol)
Weight ratio MMA:nBuMA:HEMA	22 : 31 : 47 (wt%)
T_g (MMA _n BuMA)	65 °C
T_g (HEMA)	112 °C

Synthesis Procedure:

Poly([methyl methacrylate-*co*-n-butyl methacrylate]-*b*-2-hydroxyethyl methacrylate) block copolymer was synthesized by living anionic polymerization. First, methyl methacrylate (MMA) and n-butyl methacrylate (n-BuMA) were co-polymerized; and then 2-[trimethylsilyloxy]ethyl methacrylate (hydroxyprotected HEMA monomer) was added. The obtained block copolymer was precipitated in acidic methanol solution to deprotect the hydroxyl group.

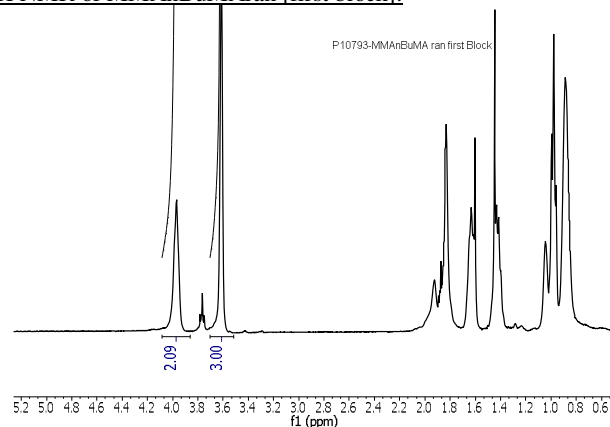
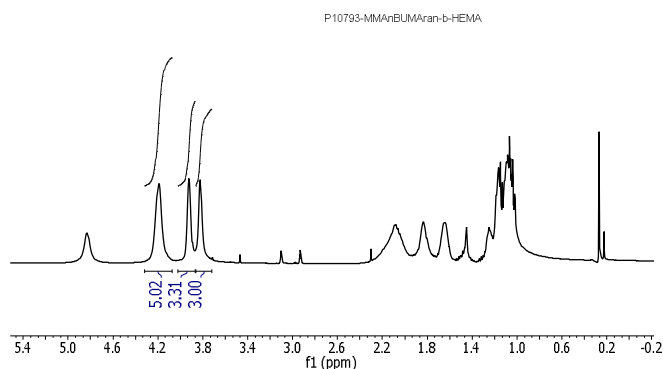
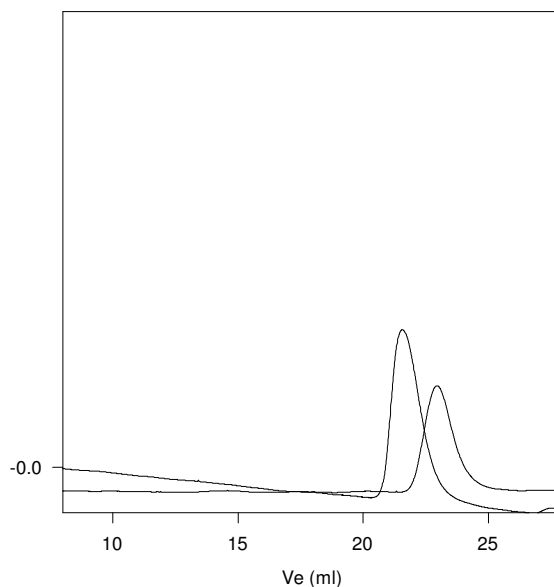
Solubility: The polymer is soluble in THF, DMF.

Characterization:

The polymer composition was determined by ^1H NMR. MMA:nBuMA molar ratio was calculated by comparing the integration of the $-\text{OCH}_2-$ protons of nBuMA (at $\delta = 3.9$ ppm) to the integration of methoxy group of MMA (at $\delta = 3.6$ ppm). Molecular weight of the second (HEMA) block was calculated by comparing the integration of $-\text{OCH}_2-$ protons of HEMATMS to the integration of methoxy group of MMA and using SEC data for the first (MMA_nBuMA) block.

The average molecular weight and polydispersity index were determined by size exclusion chromatography (SEC). For SEC analysis, the MMA_nBuMA-*b*-HEMA block copolymer can be treated with acetic anhydride in presence of pyridine to convert the hydroxy-groups to acetate groups.

Thermal analysis of the sample was done on a TA Q100 differential scanning calorimeter (DSC) at a heating rate of 10°C/min. The glass transition temperature (T_g) was determined as a midpoint of step change in heat flow curve for the second heating scan.

 ^1H NMR of MMA_nBuMA_ran [first block]: **^1H NMR of MMA_nBuMA_ran-*b*-HEMA diblock copolymer:****SEC of MMA_nBuMA_ran and MMA_nBuMA_ran-*b*-HEMATMS:****P10793-MMA_nBuMA_ran-*b*-HEMA**

Size exclusion chromatography of

1. MMA_nBuMA ran block M_n 19,000 M_w : 21,500 M_w/M_n 1.14
2. MMA_nBuMA_ran-*b*-HEMATMS: 19,000-26,500 M_w/M_n : 1.15

After deprotection M_n 19,000-*b*-17,000 M_w/M_n 1.15