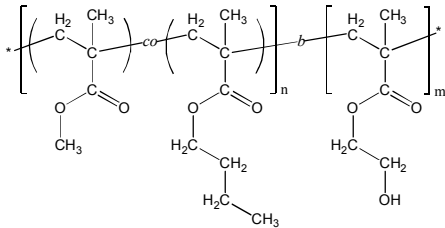


Sample Name:

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

Sample #: P11493p-MMA*n*BuMA*r*an-b-HEMA

Structure:



Composition:

| | |
|-----------------------------|----------------------|
| $M_n \times 10^3$ (g/mol) | 19.0- <i>b</i> -22.5 |
| M_w/M_n | 1.15 |
| Molar ratio MMA : nBuMA | 70 : 30 (mol/mol) |
| Weight ratio MMA:nBuMA:HEMA | 29 : 17 : 54 (wt%) |

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.

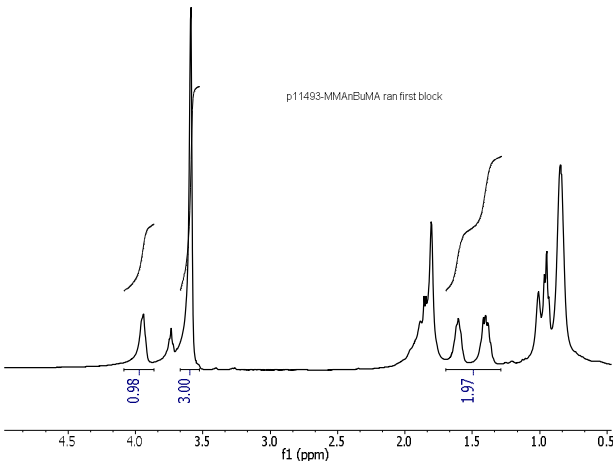
Characterization:

The polymer composition was determined by ¹H NMR. MMA:nBuMA molar ratio was calculated by comparing the integration of the -OCH₂- protons of nBuMA (at δ = 3.9 ppm) to the integration of methoxy group of MMA (at δ = 3.6 ppm). Molecular weight of the second (HEMA) block was calculated by comparing the integration of -OCH₂- protons of HEMATMS to the integration of methoxy group of MMA and using SEC data for the first (MMA*n*BuMA) block.

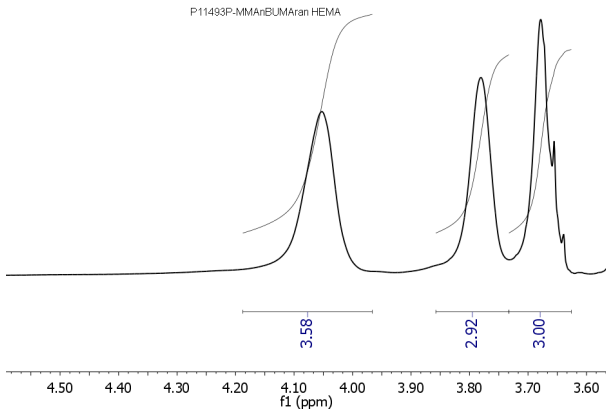
The average molecular weight and polydispersity index were determined by size exclusion chromatography (SEC). For SEC analysis, the MMA*n*BuMA-b-HEMA block copolymer can be treated with acetic anhydride in presence of pyridine to convert the hydroxy-groups to acetate groups.

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.

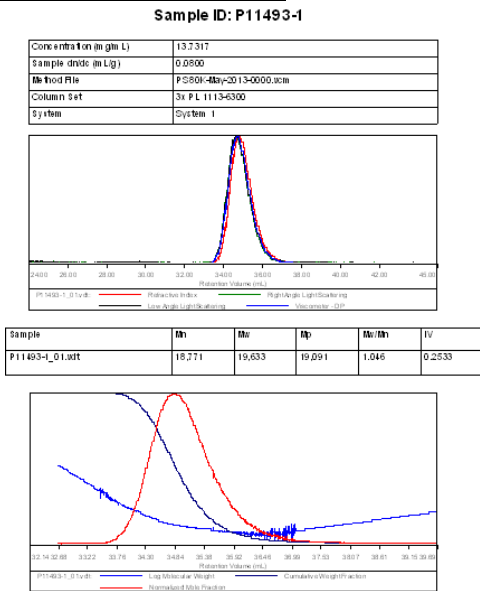
¹H NMR of MMA*n*BuMA*r*an [first block]:



¹H NMR of MMA*n*BuMA*r*an-b-HEMA diblock copolymer:



SEC of MMA*n*BuMA*r*an [first block]:



SEC of MMA*n*BuMA*r*an-b-HEMATMS:

