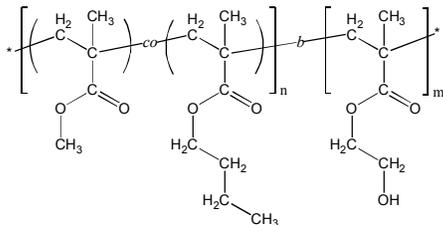


Sample Name:

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

Sample #: P10960-MMA*n*BuMA*r*an-b-HEMA

Structure:



Composition:

$M_n \times 10^3$ (g/mol)	27.0- <i>b</i> -27.0
M_w/M_n	1.15
Molar ratio MMA : nBuMA	50 : 50 (mol/mol)
Weight ratio MMA:nBuMA:HEMA	21 : 29 : 50 (wt%)
T_g (MMA <i>n</i> 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.

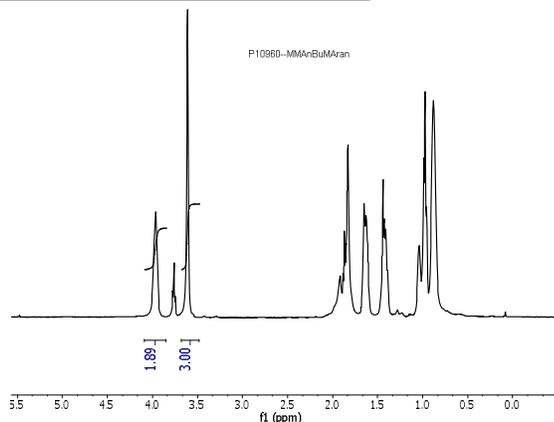
Characterization:

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 HEMA to the integration of methoxy group of MMA and using SEC data for the first (MMA*n*BuMA) block.

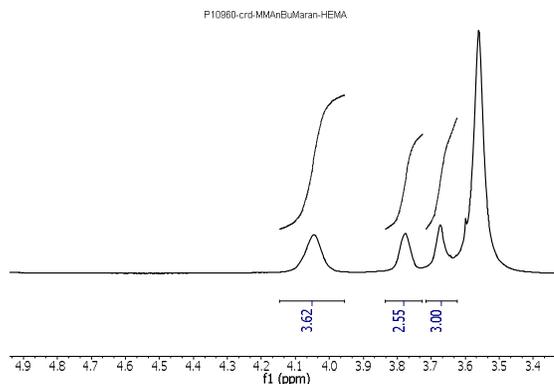
The average molecular weight and polydispersity index were determined by size exclusion chromatography (SEC). For SEC analysis, the MMA*n*BuMA-b-HEMA block copolymer can be treated with acetic anhydride in presence of pyridine to convert the hydroxy-groups to acetate groups.

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.

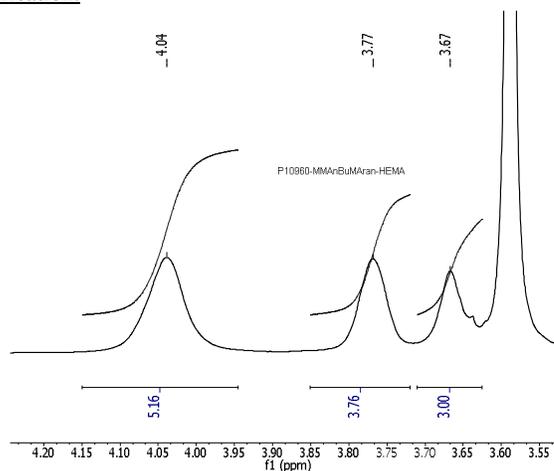
^1H NMR of MMA*n*BuMA*r*an [first block]:



^1H NMR of MMA*n*BuMA*r*an-b-HEMA in DMF-*d*7 before purification:



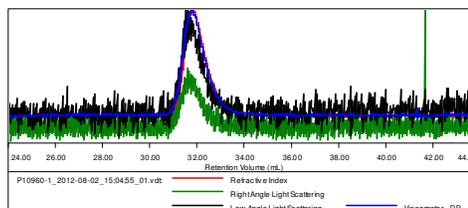
^1H NMR of MMA*n*BuMA*r*an-b-HEMA in DMF-*d*7 after purification:



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

Sample ID: P10960-I-MMA*n*BuMA

Concentration (mg/mL)	6.7126
Sample dn/dc (mL/g)	0.0800
Method File	PS80-Aug2012-0003.vcm
Column Set	3x PL 1113-6300
System	System 1



Sample	Mn (Da)	Mw (Da)	Mp (Da)	Mw/Mn	IV (dL/g)
P10960-1_2012-08-02_15:04:55_01.vdt	26,825	28,785	28,510	1.073	0.1663

