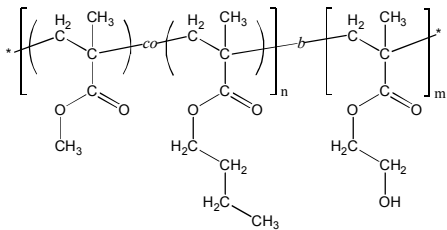


Sample Name:

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

Sample #: P10846p-MMA_nBuMA_ran-b-HEMA

Structure:



Composition:

$M_n \times 10^3$ (g/mol)	24.5- <i>b</i> -22.0
M_w/M_n	1.15
Molar ratio MMA : nBuMA	48 : 52 (mol/mol)
Weight ratio MMA : nBuMA	21 : 32 : 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:

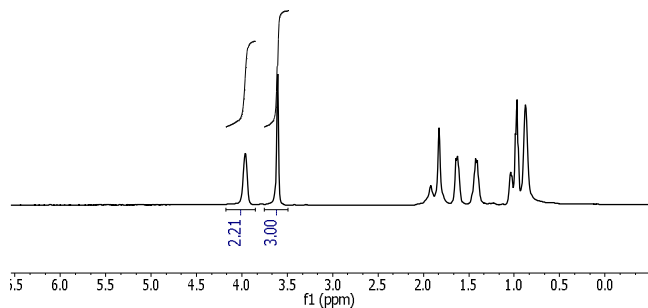
The polymer composition was determined by ¹H NMR. MMA:nBuMA molar ratio was calculated by comparing the integration of the -OCH₂- protons of nBuMA (at δ = 3.9 ppm) to the integration of methoxy group of MMA (at δ = 3.6 ppm). Molecular weight of the second (HEMA) block was calculated by comparing the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

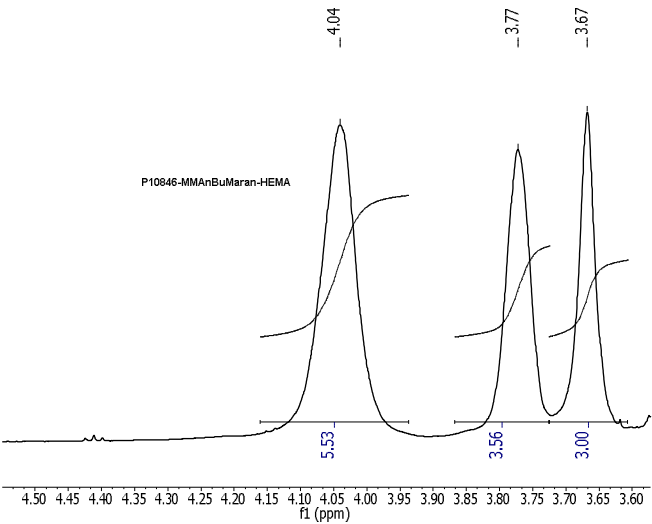
Thermal analysis of the sample was done on a TA Q100 differential scanning calorimeter (DSC) at a heating rate of 10°C/min. The glass transition temperature (T_g) was determined as a midpoint of step change in heat flow curve for the second heating scan.

¹H NMR of MMA_nBuMA_ran [first block]:

P10846-MMA_nBuMA_ran first block



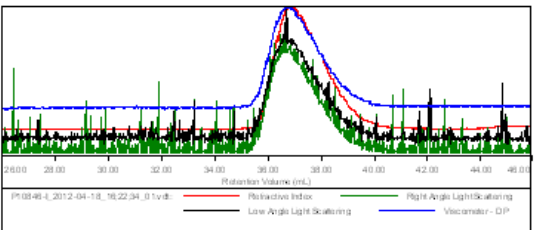
¹H NMR of MMA_nBuMA_ran-b-HEMA in DMF-d₇:



SEC of MMA_nBuMA_ran [first block]:

Sample ID: P10846-I-MMA_nBuMA

Concentration (mg/mL)	9.6664
Sample dn/dc (mL/g)	0.0800
Method File	P580-APR2012-0000.xcm
Column Set	3xPL 1113-6300
System	System 1



Sample	M_n (Da)	M_w (Da)	M_p (Da)	M_w/M_n	IV (dL/g)
P10846-I_2012-04-18_16:22:34_01.xdt	24,446	26,904	26,392	1.060	0.1691

