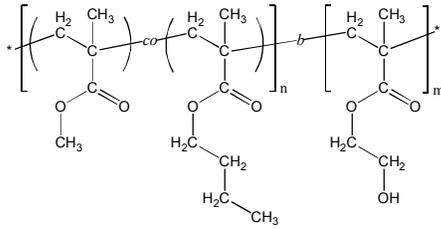


Sample Name:

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

Sample #: P10846p-MMA*n*BuMA*r*an-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 <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:

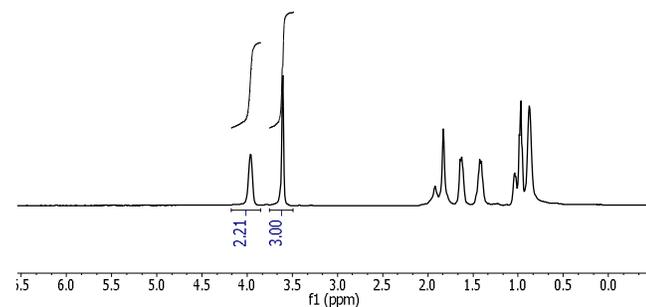
The polymer composition was determined by ^1H NMR. MMA:*n*BuMA molar ratio was calculated by comparing the integration of the -OCH₂-protons of *n*BuMA (at $\delta = 3.9$ ppm) to the integration of methoxy group of MMA (at $\delta = 3.6$ ppm). Molecular weight of the second (HEMA) block was calculated by comparing the integration of -OCH₂- 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.

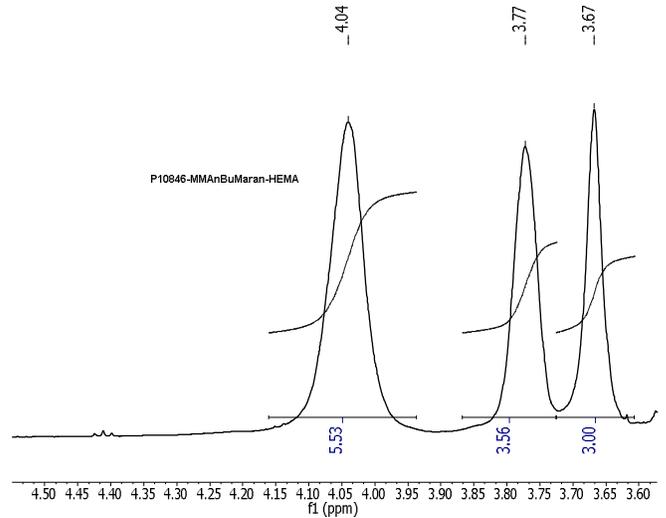
Thermal analysis of the sample was done on a TA Q100 differential scanning calorimeter (DSC) at a heating rate of 10°C/min. The glass transition temperature (T_g) was determined as a midpoint of step change in heat flow curve for the second heating scan.

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

P10846-MMA*n*BuMA*r*an first block



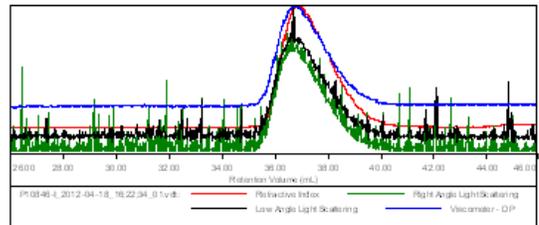
^1H NMR of MMA*n*BuMA*r*an-b-HEMA in DMF-d₇:



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

Sample ID: P10846-I-MMA*n*BuMA

Concentration (mg/mL)	9.6664
Sample dn/dc (mL/g)	0.0800
Method File	PS80-APR2012-0000.vcm
Column Set	3xPL 1113-6300
System	System 1



Sample	M_n (Da)	M_w (Da)	M_p (Da)	M_w/M_n	Γ (dL/g)
P10846-I_2012-04-18_16:22:34_01.vct	24,446	25,904	25,392	1.060	0.1691

