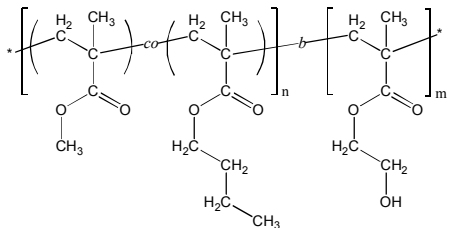


Sample Name:

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

Sample #: P11169-MMA_nBuMA_ran-b-HEMA**Structure:****Composition:**

$M_n \times 10^{-3}$ (g/mol)	38.0-43.5
M_w/M_n	1.15
Molar ratio MMA : nBuMA	15 : 85 (mol/mol)
Weight ratio MMA:nBuMA:HEMA	5 : 42 : 53 (wt%)
T_g (MMA _n BuMA)	40 °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.

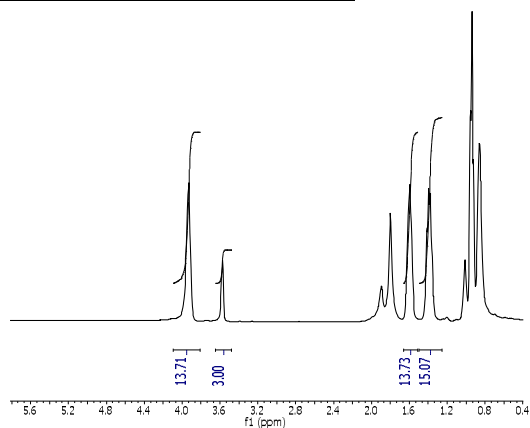
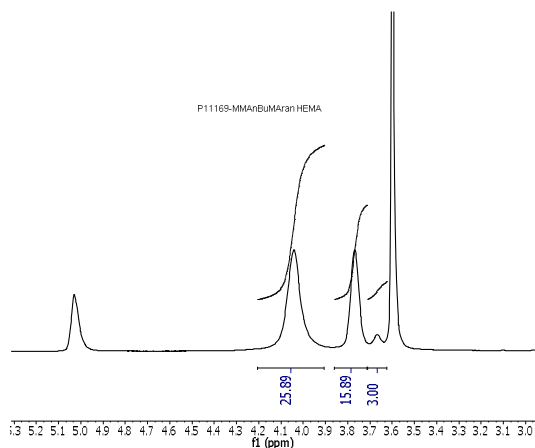
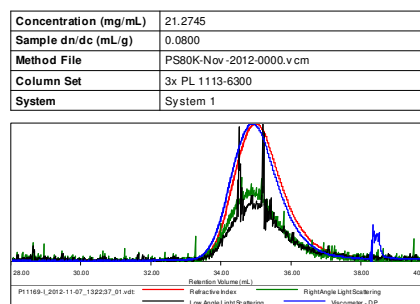
Solubility: The polymer is soluble in THF, DMF.

Characterization:

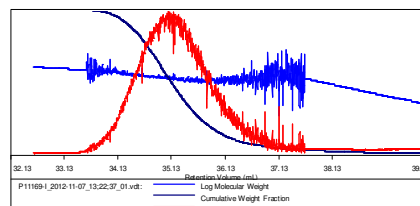
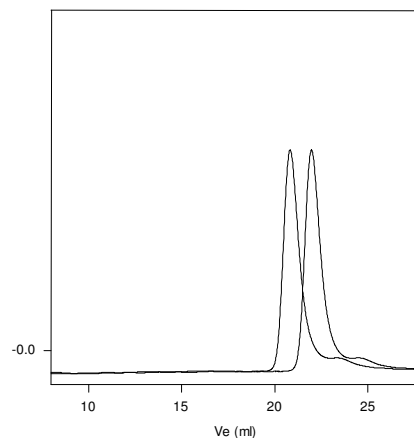
The polymer composition was determined by ^1H NMR. MMA:nBuMA molar ratio was calculated by comparing the integration of the $-\text{OCH}_2$ -protons of nBuMA (at $\delta = 3.9$ ppm) to the integration of methoxy group of MMA (at $\delta = 3.6$ ppm). Molecular weight of the second (HEMA) block was calculated 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 [first block]:**Sample ID: P11169-I-MMA_nBuMA

Sample	Mn (Da)	Mw (Da)	Mp (Da)	Mw/Mn	IV (dL/g)
P11169-I_2012-11-07_13:22:37_01.vdt	38,130	39,763	37,634	1.043	0.2255

**SEC of MMA_nBuMA_ran and MMA_nBuMA_ran-b-HEMATMS:**P11169-MMA_nBuMA_ran-b-HEMA

Size exclusion chromatography of
 1. MMA_nBuMA ran block Mn 38,000 Mw/Mn 1.04
 2. MMA_nBuMA_ran-b-HEMATMS: 38,000-67,500 MW/Mn : 1.15
 After deprotection Mn 38,000-b-43,500 Mw/Mn 1.15