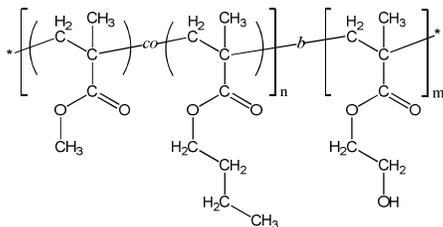


## Sample Name:

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

## Sample #: P19871-MMAnBuMAran-b-HEMA

### Structure:



### Composition:

$M_n \times 10^3$ (g/mol)	27.0-b-2.0
$M_w/M_n$	1.13

Molar ratio MMA : nBuMA	50:50 (mol/mol)
Weight ratio MMA:nBuMA	60:40

$T_g$ (MMAnBuMA)	79 °C
$T_g$ (HEMA)	Not detected

### 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]ethylmethacrylate (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:

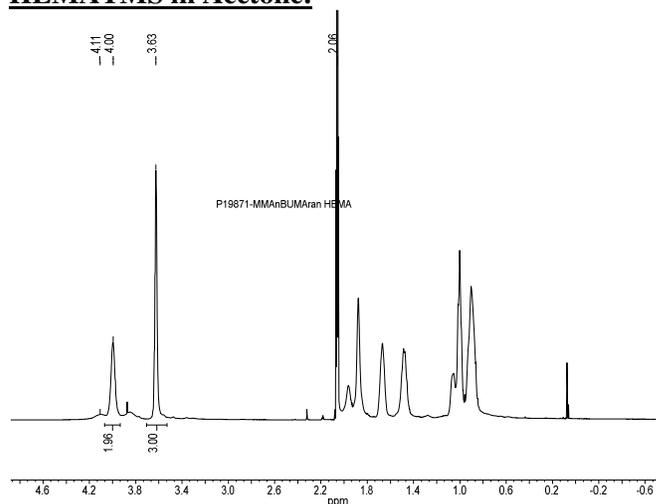
The polymer composition was determined by  $^1\text{H}$  NMR. MMA:nBuMA molar ratio was calculated by comparing the integration of the  $-\text{OCH}_2-$  protons of *n*BuMA (at  $\delta = 3.9$  ppm) to the integration of methoxy group of MMA (at  $\delta = 3.6$  ppm). Molecular weight of the second (HEMA) block was calculated by comparing the integration of  $-\text{OCH}_2-$  protons of HEMATMS to the integration of methoxy group of MMA and using SEC data for the first (MMAnBuMA) block.

The average molecular weight and polydispersity index were determined by size exclusion chromatography (SEC). For SEC analysis, the MMAnBuMA-*b*-HEMA block copolymer can be treated with acetic anhydride in

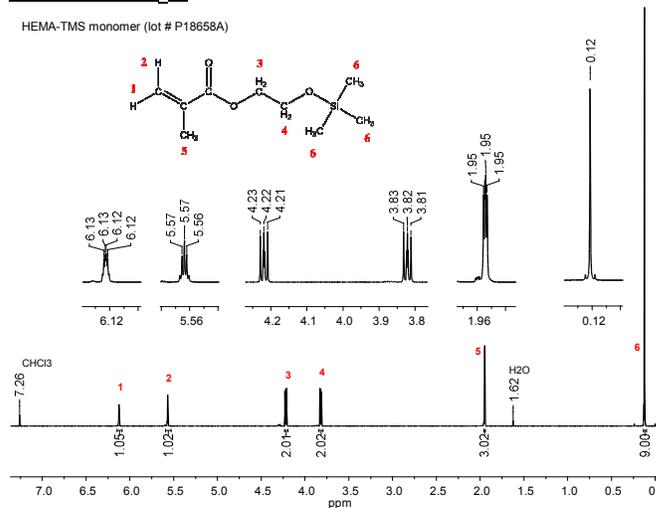
presence of pyridine to convert the hydroxy-groups to acetate groups.

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

### $^1\text{H}$ NMR spectrum of MMAnBuMAran-b-HEMATMS in Acetone:



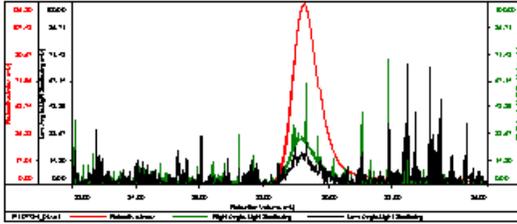
### $^1\text{H}$ NMR spectrum of HEMATMS monomer (500 MHz, $\text{CDCl}_3$ ):



**SEC elugram of MManBuMAran [first block]:**

**MManBuMA**

Concentration (mg/mL)	0.593
Sample dn/dc (mL/g)	0.090
Method File	F5304-Merck025-001.dum
Column Set	3: PL 110-500
Solvent	THF



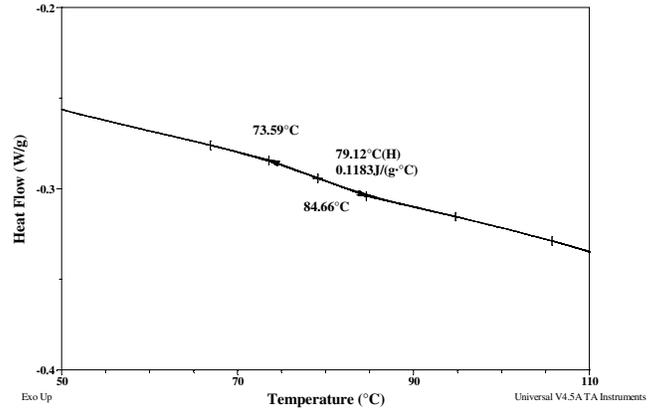
Sample	Mn (Da)	Mw (Da)	Mw/Mn	IV (dL/g)	Rn (nm)	Ret Vol (mL)
P0775-LJ 1.cdf	27,336	31,760	1.120	1.2664	0.22	20.200

**DSC thermogram of MManBuMAran-b-HEMA:**

Sample: P19424  
Size: 8.4000 mg

DSC

File: P19424.001



Sample: P19424  
Size: 8.4000 mg

DSC

File: P19424.001

