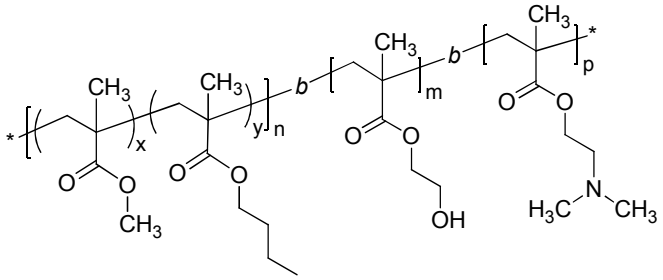
Sample Name:

Poly(methyl methacrylate–*co*$_{(random)}$–n-butyl methacrylate) –*block*–poly(2-hydroxyethyl methacrylate)–*block*– poly(N,N-dimethylaminoethyl methacrylte)

Sample #

P19682-MMAnBuMAran-b-HEMA-b-DMAEMA

Structure:



Composition:

$M_n \times 10^3$ (g/mol) [MMAnBuMA–HEMA–DMAEMA]	29.6–*b*–37.7–*b*–5.3
M_w/M_n	1.1
MMA : nBuMA molar ratio	55 : 45

Synthesis Procedure:

The above ABC-type triblock copolymer was synthesized by living anionic polymerization. First, methyl methacrylate (MMA) and n-butyl methacrylate (n-BuMA) were co-polymerized; then 2-[trimethylsilyloxy]ethyl methacrylate (hydroxy-protected HEMA monomer) was added to obtained the diblock copolymer; followed by addition of N,N-dimethylaminoethyl methacrylate monomer. To remove TMS group, the obtained triblock copolymer was precipitated into acidic methanol solution.

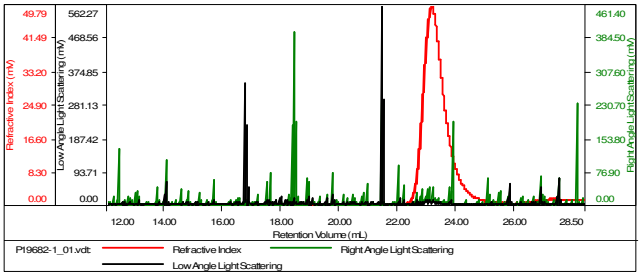
Characterization:

The ratio between MMA:nBuMA was calculated by ^{1}H NMR spectroscopy. Molecular mass of the first block was determined by size exclusion chromatography (SEC); and molecular masses of the other blocks were calculated from NMR and compared to SEC data for the 1st block. Polydispersity index (M_w/M_n) was determined SEC.

SEC of MMAnBuMAran [first block]:

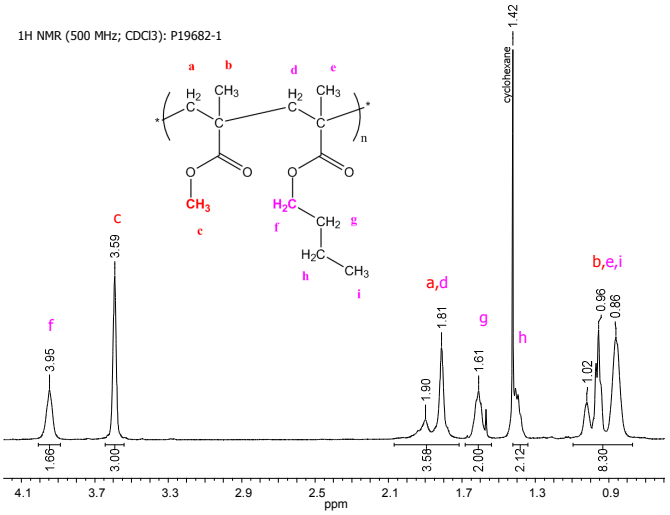
Sample ID-PD19682-1

Concentration (mg/mL)	0.4639
Sample dn/dc (mL/g)	0.0880
Method File	PS80K-June30-2015-0000.vcm
Column Set	3x PL 1113-6300
Solvent	THF



Sample	MW Number Average (Da)	MW Weight Average (Da)	MW at Peak (Da)	Polydispersi	Intrinsic Viscosity (dL/g)
P19682-1_01.vdt	29,632	35,787	35,751	1.208	0.7753

^{1}H NMR spectrum of MMAnBuMAran:

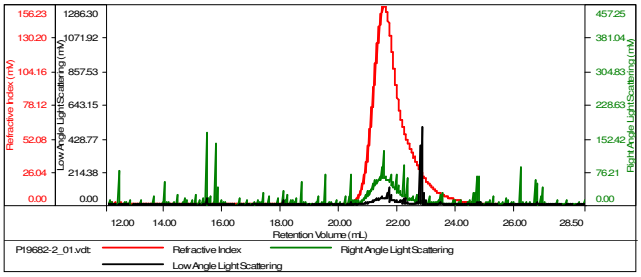


Dp: MMA=137, nBuMA=112.

SEC of MMAnBuMAran-b-HEMATMS [protected diblock]:

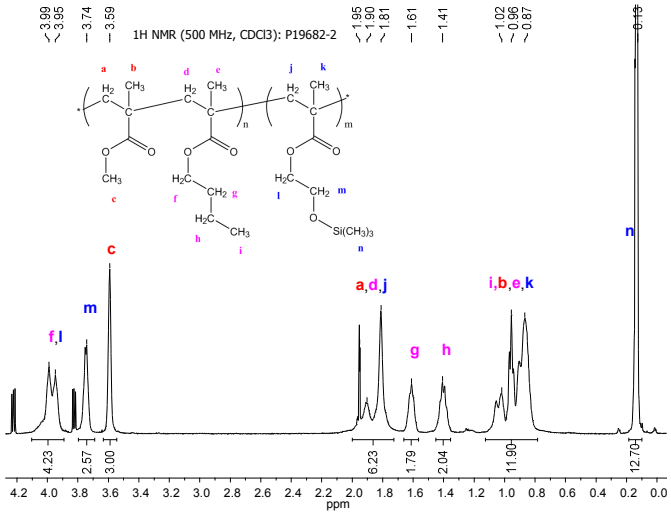
Sample ID-PD19682-2

Concentration (mg/mL)	2.0061
Sample dn/dc (mL/g)	0.0840
Method File	PS80K-June30-2015-0000.vcm
Column Set	3x PL 1113-6300
Solvent	THF

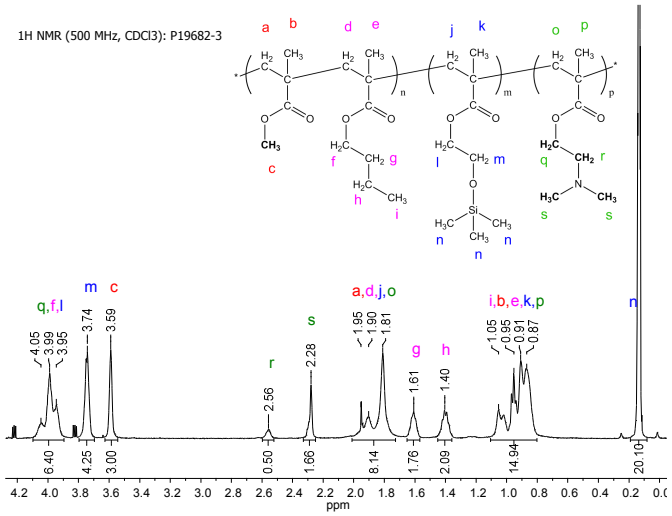


Sample	MW Number Average (Da)	MW Weight Average (Da)	MW at Peak (Da)	Polydispersi	Intrinsic Viscosity (dL/g)
P19682-2_01.vdt	53,450	58,972	60,404	1.103	1.0403

^{1}H NMR spectrum of MMAnBuMAran-b-HEMATMS:



^{1}H NMR of MMAnBuMAran-b-HEMATMS-b-DMAEMA:



Dp: HEMA(TMS)=290, DMAEMA=34.

^{1}H NMR of MMAnBuMAran-b-HEMA-b-DMAEMA
(triblock copolymer after deprotection of the 2nd block):