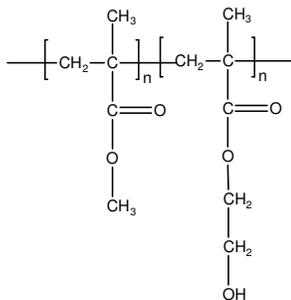


Sample Name:

Poly(methylmethacrylate-b-2-hydroxy ethyl methacrylate)

Sample #: P9235-MMAHEMA

Structure:



Composition:

Mn × 10 ³ MMA-b-HEMA	PDI
43.0-b-15.0	1.13
T _g for MMA block: 126°C	T _g for HEMA block: 74°C

Synthesis Procedure:

Poly(Methyl methacrylate-b-2-hydroxy ethyl methacrylate) Block copolymer is synthesized by living anionic polymerization with sequence addition of methyl methacrylate followed by addition of protecting hydroxyl HEMA (trimethyl siloxy ethyl methacrylate monomer). The obtained polymer was precipitation in methanol/acidic to deprotect the hydroxyl group.

Characterization:

SEC analysis of the obtained block copolymer in THF in presence of triethyl amine as eluent resulting in an ambiguity of the result because some of the trimethylsilyloxy ethyl methacrylate units are deprotected to convert hydroxy ethyl methacrylate.

The SEC analysis of the final polymer is carried out after protecting OH groups of hydroxy ethyl methacrylate to acetate group was treated with acetic anhydride in presence of pyridine. The SEC analysis of the obtained polymer gives more reliable results.

The final block copolymer composition by ¹H-NMR spectroscopy in CdCl₃ also yield the uncertainty of the analysis because of poor solubility of poly HEMA block in CdCl₃. The composition of the obtained polymer therefore, carried out in CdCl₃ after protecting the OH group with acetic anhydride by comparing the peak area of the methyl ester protons at 3.6 ppm with the peak area of ethyl methacrylate at 4.2-4.17 ppm. Block copolymer PDI is determined by SEC.

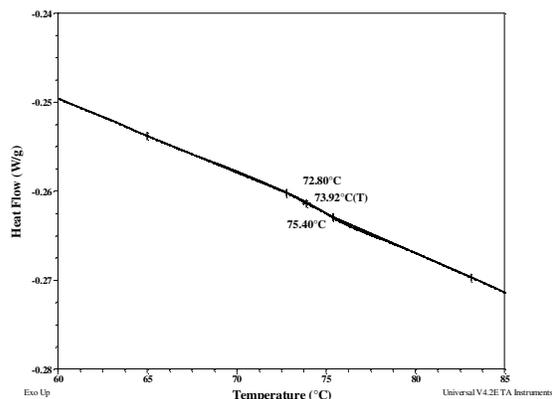
Thermal analysis:

Thermal analysis of the samples was carried out on a TA Q100 differential scanning calorimeter at a heating rate of 10°C/min. The midpoint of the slope change of the heat flow plot of the second heating scan was considered as the glass transition temperature (T_g).

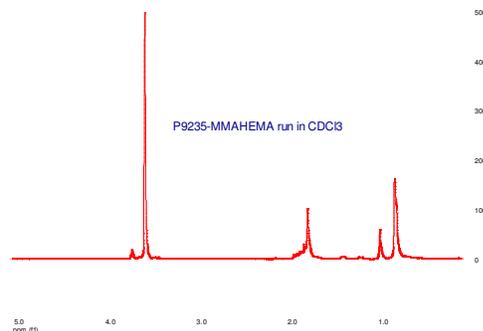
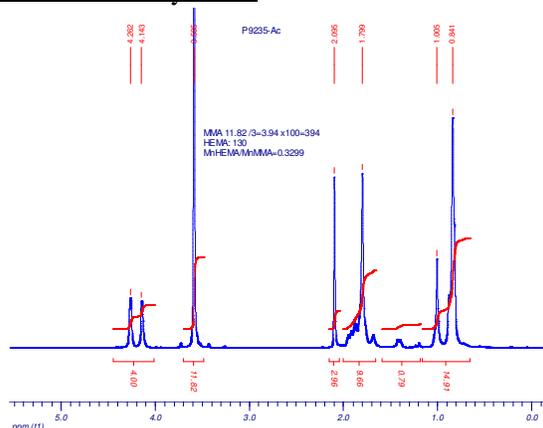
Solubility:

Polymer is soluble in DMF.

DSC thermogram for HEMA block:

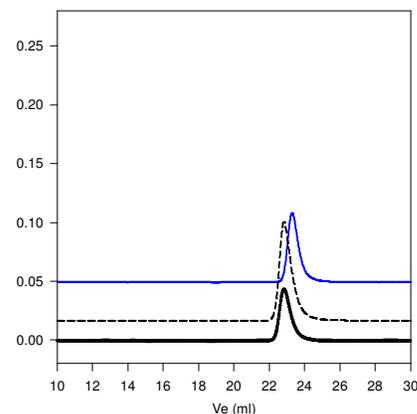


¹H-NMR Spectrum of the block copolymer treated with acetic anhydride:



SEC of the block copolymer:

P9235-MMAHEMA



— Poly(MMA): M_n=43000, M_w=46500, M_w/M_n=1.08,
- - - Block Copolymer PMMA(43000)-b-HEMATMS(25500), M_w/M_n=1.13
After Protection OH with acetic anhydride
After deprotection OH group: PMMA(43000)-b-HEMA(15000), M_w/M_n=1.13

DSC thermogram for MMA block:

