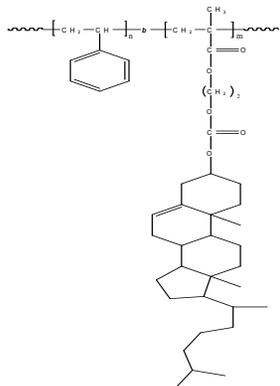


Sample Name:

Poly(styrene-b-2-cholesteryloxycarbonyloxy ethyl methacrylate)

Sample #P5406A- SHEMAc

Structure:



Composition:

Mn x 10 ³ S-b-HEMAc	Mw/Mn (PDI)
28.0-b-48.0	1.15
T _g for PS block:	100°C
T _g of HEMAc-Block	122°C

Synthesis Procedure:

Poly(styrene-b-cholesteryloxycarbonyloxy ethyl methacrylate) is prepared by living anionic polymerization with sequence addition of styrene followed by trimethylsilyl ethyl methacrylate (HEMA-TMS). The cholesterol unit is added by deprotection of the OH group followed by esterification with cholesteryl chloroformate in presence of pyridine.

Characterization:

An aliquot of the polystyrene block was terminated before addition of trimethylsilyl ethyl methacrylate and analyzed by size exclusion chromatography (SEC) to obtain the molecular weight and polydispersity index (PDI). The final block copolymer composition was calculated from ¹H-NMR spectroscopy by comparing the peak area of the styrene protons at 6.3-7.2 ppm with the peak area of ethyl methacrylate. Block copolymer PDI is determined by SEC.

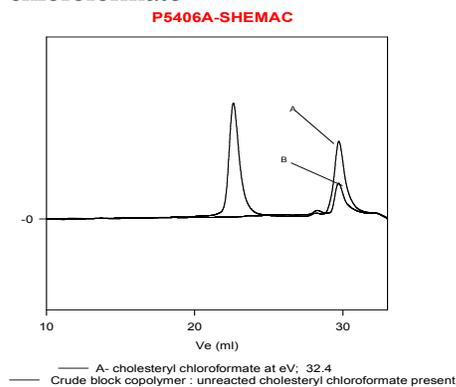
Solubility:

Poly(styrene-b-hydroxy ethyl methacrylate) is soluble in THF and CHCl₃.

Purification of the obtained polymer:

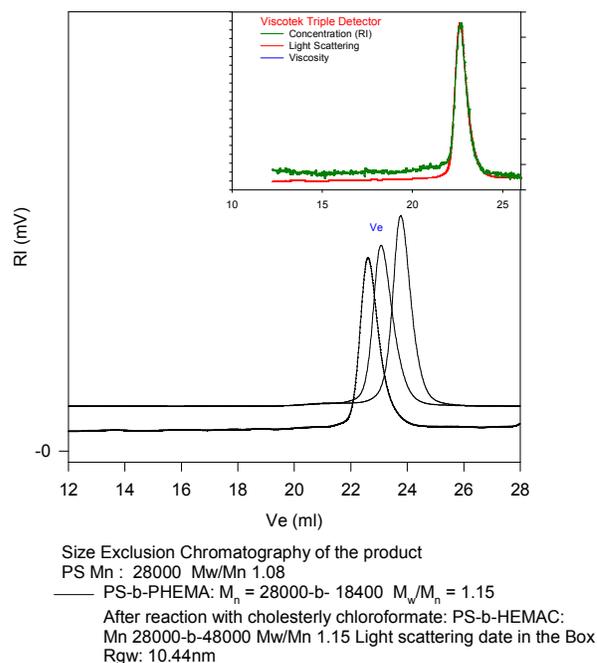
Polymer obtained after the reaction of PSHEMA with cholesteryl chloroformate, the resulting polymer also contains the excess of unreacted cholesteryl chloroformate. The unreacted cholesteryl chloroformate was removed by solvent/nonsolvent (hexane/methanol) mixture and the resulting polymer was analyzed by SEC. Free cholesteryl chloroformate molecule was absent in the obtained purified polymer. Polymer was dissolved in dried benzene and filtered. The filtrate was freeze-dried from benzene.

SEC of the Crude block copolymer and cholesteryl chloroformate



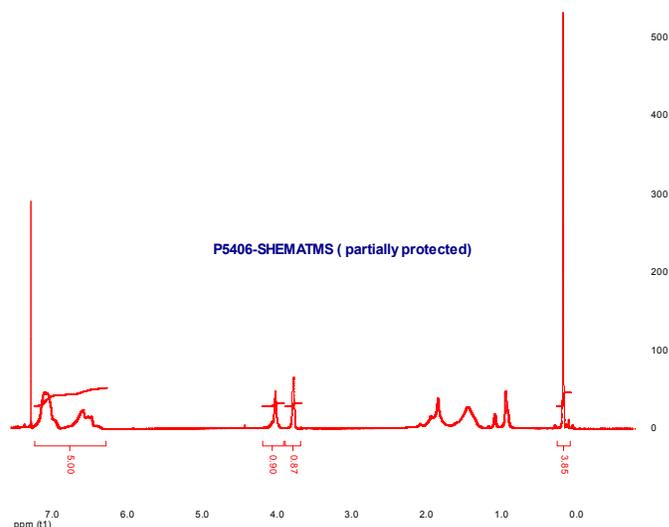
SEC of the Purified Block Copolymer:

P5406A-SHEMAc

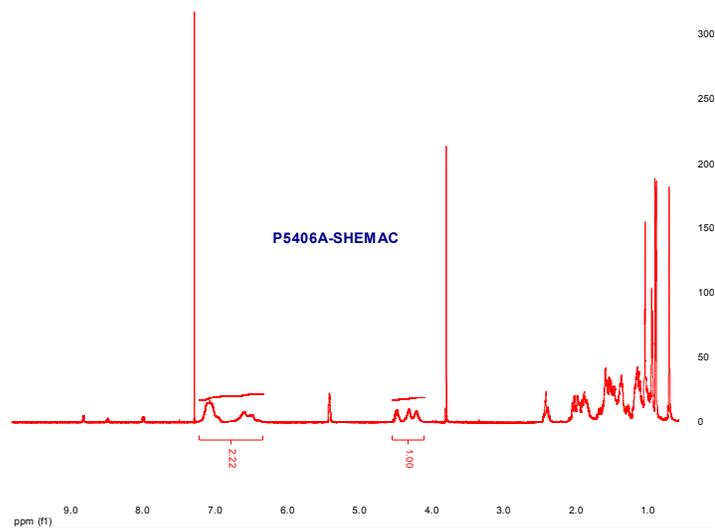


¹H-NMR spectrum of the sample

S-HEMA-Partially protected polymer: Some of the trimethyl silyl group deprotected during the process:



S HEMAC



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.

Thermogram for block polymer:

