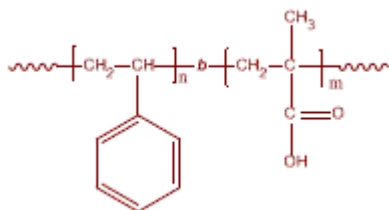


Sample Name: Poly(styrene-b- methacrylic acid)

Polymethacrylic acid rich in isotactic microstructure (the mm triad > 95%)

Sample #: P6527-SiMAA

Structure:

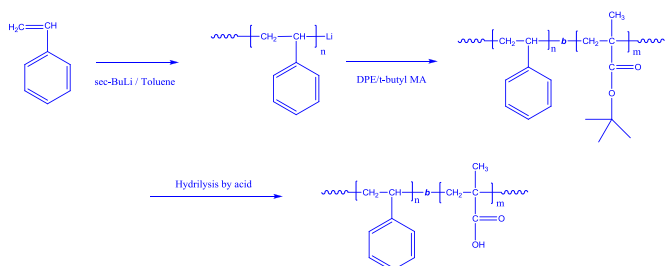


Composition:

Mn x 10 ³ PS-b-PMAA	PDI
36.0-b-2.2	1.08
Degree of polymerization: PS(346)-b-PMAA(26)	

Synthesis Procedure:

Poly(styrene-b- methacrylic acid) is prepared by living anionic polymerization with sequence addition of styrene followed by t-butyl methacrylate. Polymerization was carried out in Toluene. For the further information please see the reference.¹ The obtained polymer is hydrolysed in the presence of acid as catalyst. The reaction scheme is shown below:



Characterization:

An aliquot of the polystyrene block was terminated before addition of t-butyl acrylate 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 or on line SEC with light scattering detectors. Block copolymer PDI is determined by SEC.

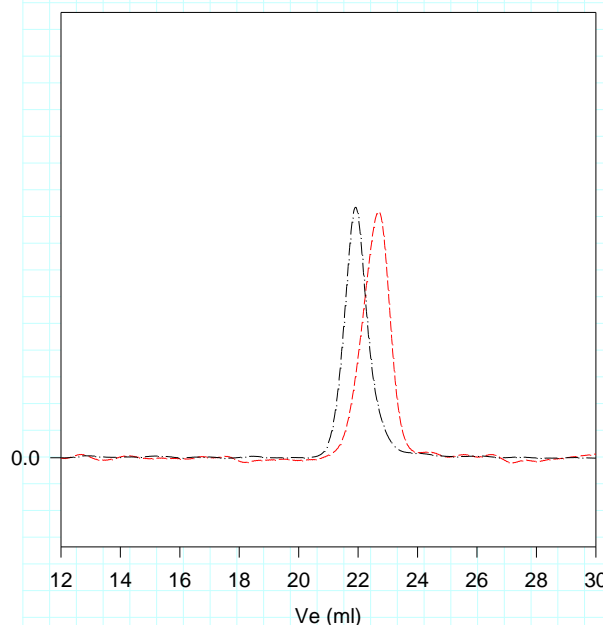
The hydrolysis of the tert. butyl ester to acid was followed by FT-IR spectroscopy by disappearance of characteristic absorbance at 1362cm⁻¹ of tert.butyl group.

Solubility:

Poly(styrene-b-methacrylic acid) is soluble in THF, dioxane and also in methanol (depending on the compositions with a short segment of polystyrene with long segment of poly methacrylic acid). The polymers is precipitated out from ether, hexane.

SEC of the block copolymer:

P6527-StBMA
(Precursor of P6527-SiMAA)



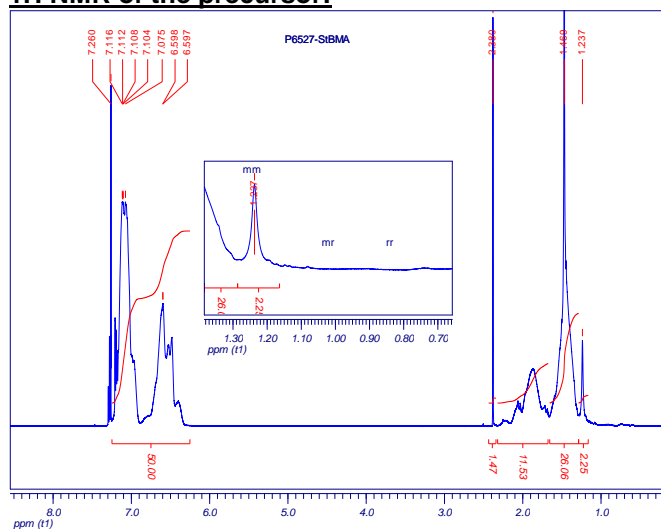
Size Exclusion Chromatogram of Poly(styrene-b-t-butyl methacrylate)

--- Polystyrene: M_n=36000, M_w=38000, M_w/M_n=1.06

--- PS-b-PtBMA: M_n PS(36000)-PtBMA(3700), M_w/M_n=1.08

Hydrolysis: PS(36000)-PiMAA(2200)

¹H NMR of the precursor:



Reference:

1. S. K. Varshney, Z. Gao, Xing Fu Zhong, A. Eisenberg
"Effect of Lithium Chloride on the "Living" Polymerization of tert-Butylmethacrylate and Polymer Microstructure Using Monofunctional Initiators" Macromolecules, 1994, 27, 1076.

