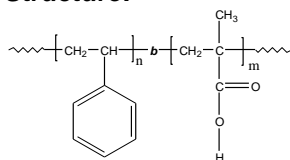


Sample Name: Poly(styrene-b- methacrylic acid)

Sample #: P18214A-SMAA or their salt

Structure:

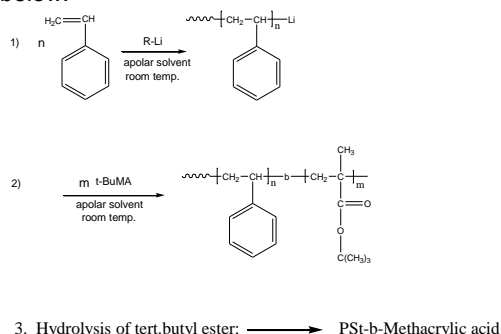


Composition:

Mn x 10 ³ PS-b-PMAA	PDI
32.8-b-4.8	1.03

Synthesis Procedure:

Poly(styrene-b- methacrylic acid) is prepared by living anionic polymerization with sequence addition of styrene followed by t-butyl methacrylate. The obtained polymer is hydrolysed in the presence of acid as catalyst. The reaction scheme is shown below:



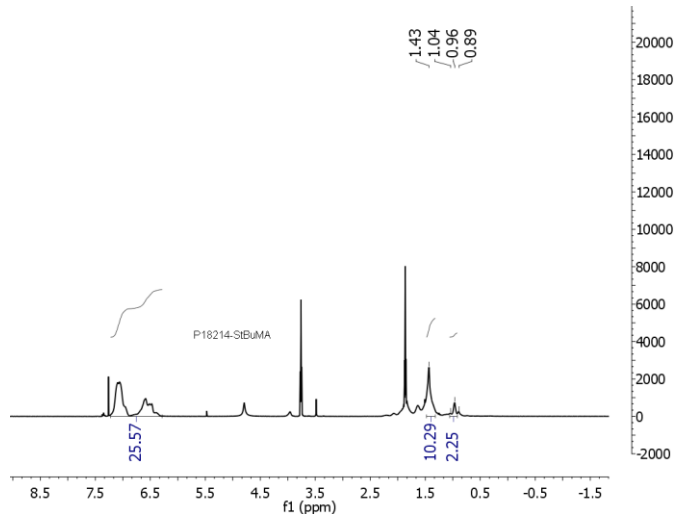
Characterization:

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.

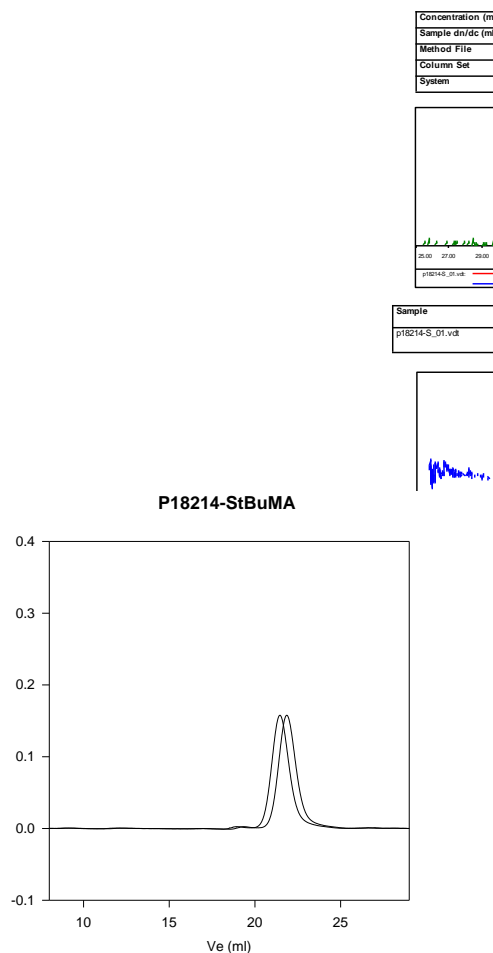
The hydrolysis of the tert. butyl ester to acid was followed by FT-IR spectroscopy by disappearance of characteristic absorbance at 1362cm⁻¹ of tert.butyl group.

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 profile of the block copolymer



Size exclusion chromatography of polystyrene-b-poly(t-butyl methacrylate)

— Polystyrene, M_n=32,800, M_w=33,600, PI=1.04
— Block Copolymer PS(32,800)-b-PtBuMA(7,800), PI=1.03

After Hydrolysis of ester: Mn 32,800-b-4,800 Mw/Mn 1.03