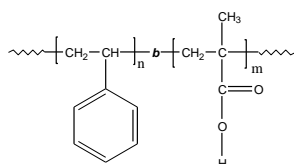


Sample Name: Poly(styrene-*b*- methacrylic acid)

Sample #: P10134-SMAA

Structure:

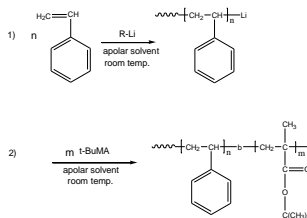


Composition:

Mn x 10 ³ PS- <i>b</i> -PMAA	PDI
33.1- <i>b</i> -6.7	1.10

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:



3. Hydrolysis of tert.butyl ester: \longrightarrow PS-*b*-Methacrylic acid

Characterization:

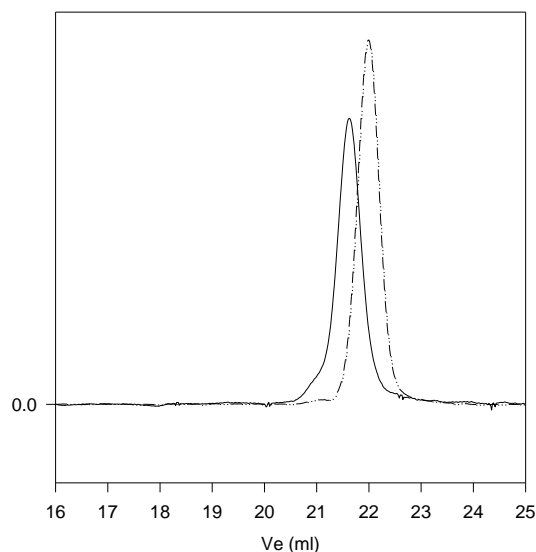
An aliquot of the polystyrene block was terminated before addition of *t*-butyl acrylate and analyzed by size exclusion chromatography (SEC) to obtain the molecular weight and polydispersity index (PDI). The final block copolymer composition was calculated from ¹H-NMR spectroscopy or on line SEC with 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 meth acrylic 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=33100, M_w=34600, PI=1.05

———— Block Copolymer PS(33100)-*b*-PtBuMA(11000), PI=1.10
After Hydrolysis: PS(33100)-*b*-MAA(6700) Mw/Mn: 1.10