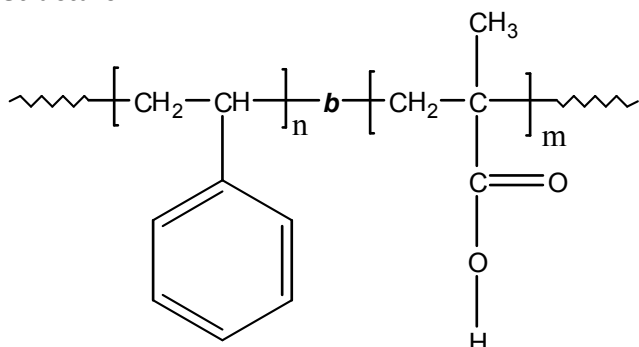


Sample Name: Poly(styrene-b- methacrylic acid)

Sample #: P10136A-SMAA or their salt

Structure:

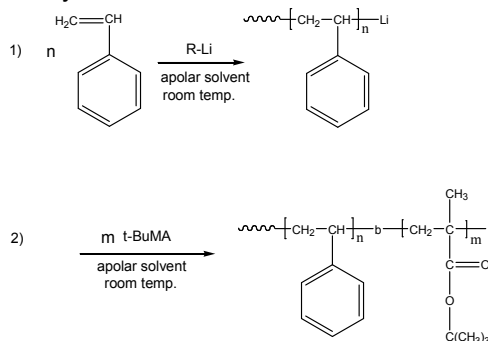


Composition:

Mn x 10 ³ PS-b-PMAA	PDI
33.0-b-6.9	1.12

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 PSt-b-Methacrylic acid

Characterization:

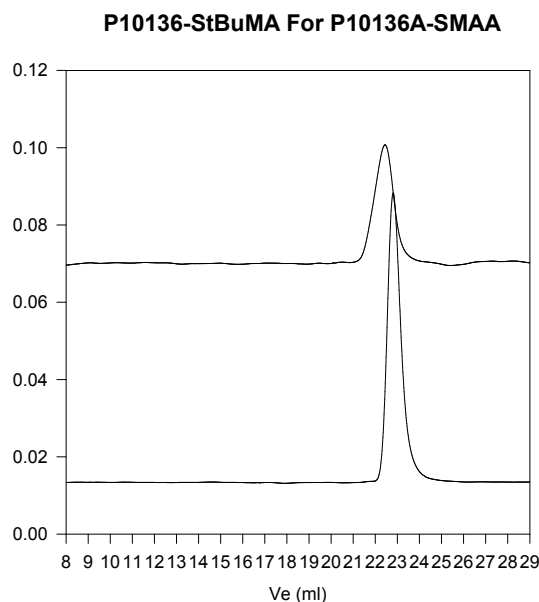
An aliquot of the polystyrene block was terminated before addition of t-butyl acrylate and analyzed by size exclusion chromatography (SEC) to obtain the molecular weight and polydispersity index (PDI). The final block copolymer composition was calculated from ¹H-NMR spectroscopy or on line SEC with light 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 of the block copolymer:



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

— Polystyrene, M_n=33,000, M_w=35,000, PI=1.08

— Block Copolymer PS(33,000)-b-PtBuMA(12,000), PI=1.12

After Hydrolysis of tert. Butyl ester:

PS-b-MAA: 33,000-b-6,900 Mw/Mn 1.12