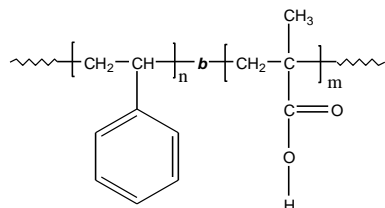


Sample Name: Poly(styrene-b- methacrylic acid)

Sample #: P18213A-SMAA or their salt

Structure:

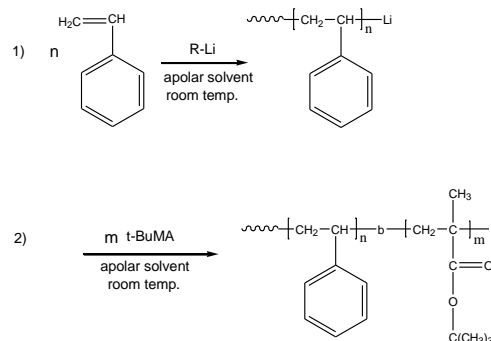


Composition:

Mn x 10 ³ PS-b-PMAA	PDI
35.0-b-4.4	1.02

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

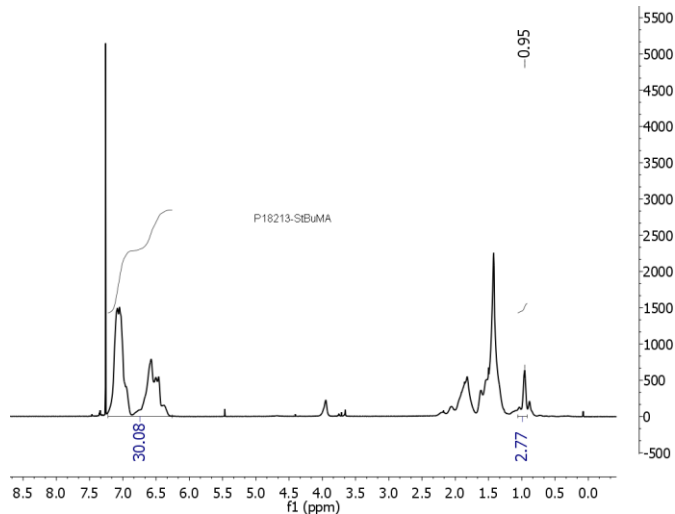
Characterization:

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:

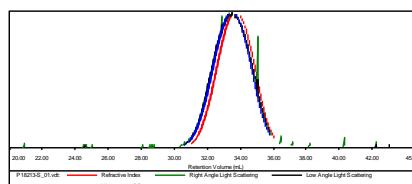
Poly(styrene-b-methacrylic acid) is soluble in THF, dioxane and also in methanol (depending on the compositions with a short segment of polystyrene with long segment of poly meth acrylic acid). The polymers is precipitated out from ether, hexane.



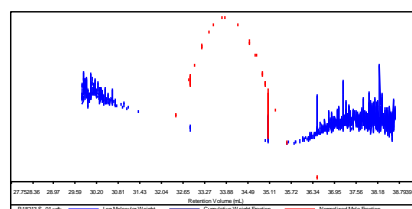
SEC profile of the block copolymer

Sample ID: P18213-S

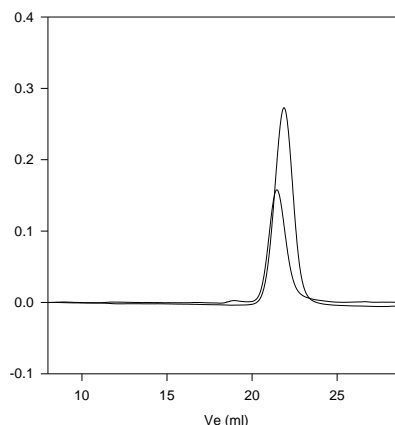
Concentration (mg/mL)	58.5580
Sample dilution (mL/g)	0.1850
Method File	P580K-Sapp08-2013-0000.vcm
Column Set	3x PL 1113-6300
System	System 1



Sample	Mn	Mw	Mp	Mw/Mn	IV
P18213-S_01.v08	34,913	36,189	34,091	1.037	0.2770



P18213-StBuMA



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

— Polystyrene, M_n=35,000, M_w=36,000, PI=1.04
— Block Copolymer PS(35,000)-b-PtBuMA(7,000), PI=1.02

After Hydrolysis of ester: Mn 35,000-b-4,400 Mw/Mn 1.02