

Sample Name:

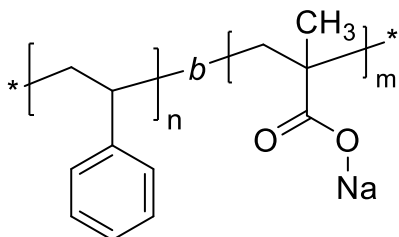
Poly(styrene)-*b*-poly(methacrylic acid sodium salt)

Other name:

Poly(styrene-*block*-sodium methacrylate)

Product ID: **P5100-SMANa**

Structure:



Composition:

$M_n \times 10^3$ g/mol [PS- <i>b</i> -PMANa]	M_w/M_n
7.5- <i>b</i> -16.0	1.10

Synthesis Procedure:

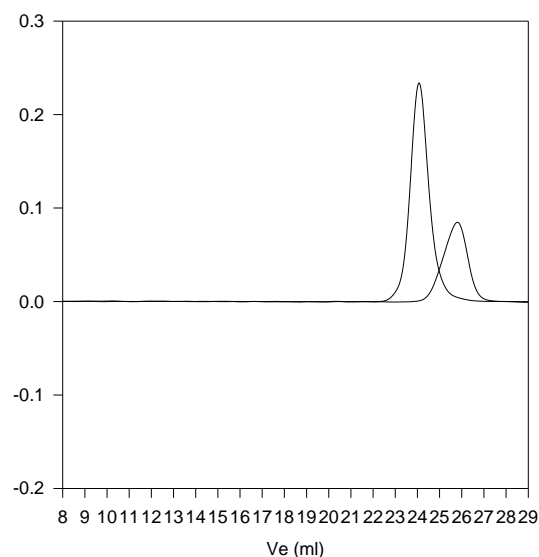
Poly(styrene-*b*-methacrylic acid sodium salt) was synthesized by living anionic polymerization technique by sequential addition of styrene monomer and then t-butyl methacrylate monomer, followed by hydrolysis of the obtained polymer and treatment with NaOH.

Characterization:

An aliquot of polystyrene reaction mass was terminated before addition of t-butyl acrylate and analyzed by size exclusion chromatography (SEC) to obtain the molecular weight of the first block. The intermediate product, poly(styrene-*b*-tert-butyl methacrylate) was also analyzed by SEC. The molecular weight of the final product was calculated from $^1\text{H-NMR}$ spectroscopy and using the above SEC data. FT-IR spectroscopy analysis was done to confirm the complete conversion of the tert-butyl group (characteristic absorbance peak at 1362cm^{-1}) into acid and/or salt.

SEC of the diblock copolymer precursor:

P5100-StBuMA before hydrolysis



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

— Polystyrene, $M_n=7500$, $M_w=8700$, $PI=1.17$

— Block Copolymer PS(7500)-*b*-PtBuMA(21000), $PI=1.10$
after Hydrolysis of tert.butyl ester:

Mn: PSt(7500)-*b*-MAA(12700) M_w/M_n 1.10

Its sodium salt: 7500-*b*-16000 M_w/M_n 1.10