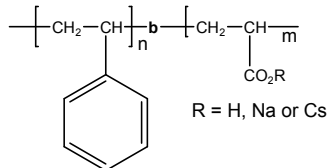


Sample Name:
Poly(styrene -b- acrylic acid)

Sample #: P3992-SAA

Structure:

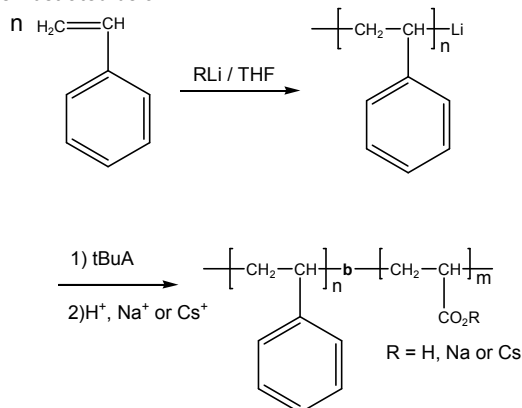


Composition:

Mn x 10 ³ PS-b-PAA	PDI
12.0-b-1.1	1.10

Synthesis Procedure:

Poly(styrene-b-acrylic acid) is prepared by living anionic polymerization with sequence addition of styrene followed by t-butyl acrylate and hydrolysis of the t-butyl group. The scheme of the reaction is illustrated below:



Characterization:

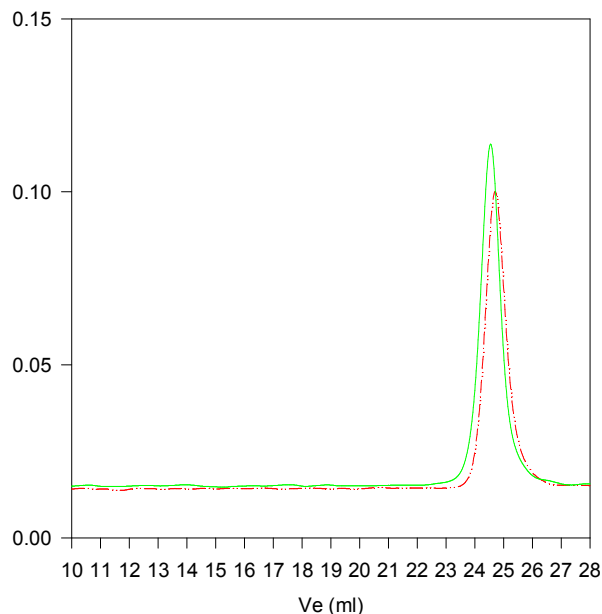
An aliquot of the polystyrene block was terminated before addition of t-butyl acrylate and analyzed by size exclusion chromatography (SEC) to obtain the molecular weight and polydispersity index (PDI). The hydrolysis of the tert. butyl ester to acid was followed by FT-IR spectroscopy by disappearance of characteristic absorbance at 1362cm⁻¹ of tert.butyl group.

Solubility:

Poly(styrene-b-acrylic 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 acrylic acid). The polymers is precipitated out from ether, hexane.

SEC of the block copolymer:

P3992-StBuA Precursor for P3992-SAA



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

- Polystyrene, M_n=12000, M_w=12600, PI=1.05
- Block Copolymer PS(12000)-b-PtBuA(1900), PI=1.10

After Hydrolysis of tert. butyl ester:
Block Copolymer PS(12000)-b-PAA(1100), PI=1.10

References:

- S. K. Varshney, R. Fayt, Ph. Teyssie, and J.P. Hautekeer US Patent 5,264,527 (1993)
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- Ph. Teyssie, R. Fayt, J. P. Hautekeer, C. Jacobs, R. Jerome, L. Leemans and S. K. Varshney *Makromolekular Chemie, Macromol. Symp.*, 1990, 32,61-73.
- S. K. Varshney, J. P. Hautekeer, R. Fayt, R. Jerome, and Ph.Teyssie *Macromolecules*, 1990, 23, 2618-2622.
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