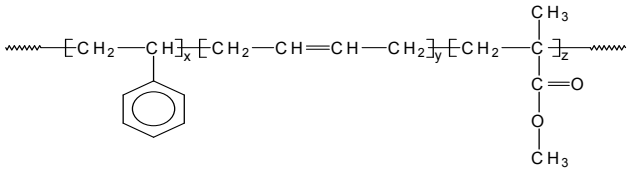
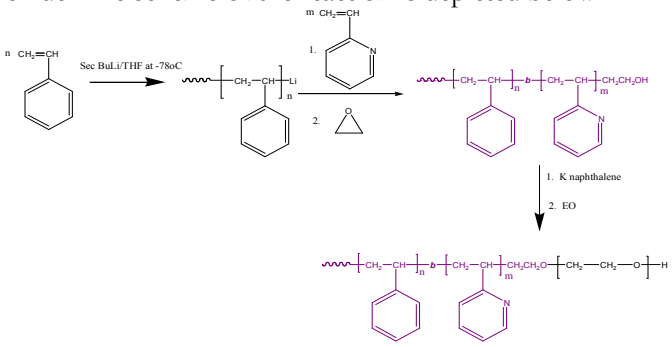
Sample Name:
Poly(styrene-b-butadiene$_{\text{(rich in 1,4 addition)}}$-b-methylmethacrylate)
Sample #: P4895-SBdMMA
Structure:



Composition:

Mn x 10^3 S-b-Bd-b-MMA	PDI	
80.0-b-1.2-b-75.0	1.18	
T_g for PS block 104°C	T_g for Bd block Not found	T_g for MMA block 133°C

***Synthesis Procedure*:**
Poly(styrene-b-2-vinyl pyridine-ethylene oxide) triblock copolymer is prepared by living anionic polymerization. The triblock is synthesized in 2 steps: 1st a OH terminated Poly(S-b-2VP) is synthesized in THF at –78°C using LiCl as an additive. Polystyrene macroanions were end capped with a unit of diphenyl ethylene (DPE) before adding 2-vinylpyridine (2VP) monomer. The reaction was terminated with ethylene oxide. The OH terminated Poly(S-b-2VP) was converted to potassium salt by addition of K-naphthalene and freshly distilled ethylene oxide. The scheme of the reaction is depicted below:

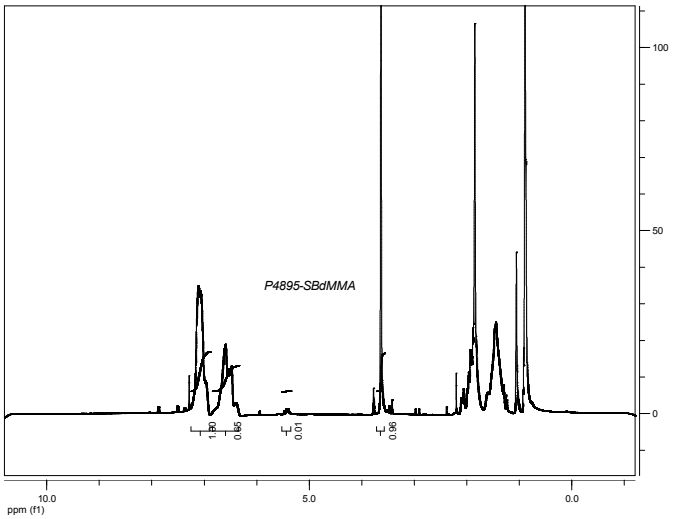


Characterization:

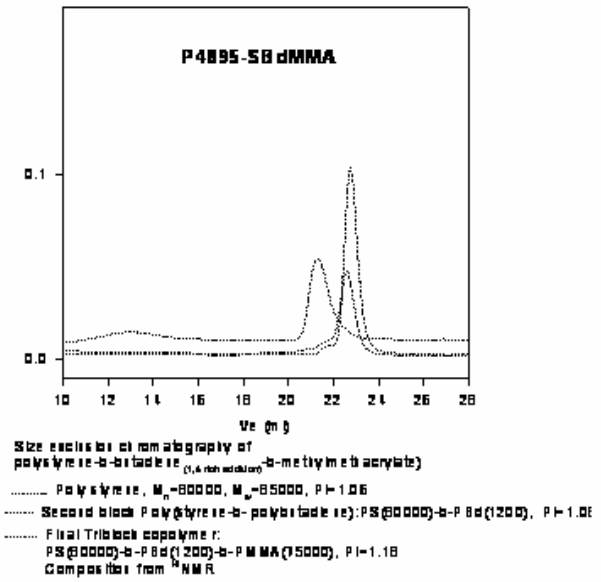
An aliquot of the anionic polystyrene block was terminated before addition of 2VP and analyzed by size exclusion chromatography (SEC) to obtain the molecular weight and polydispersity index (PDI). The Block copolymer composition was then calculated from ^{1}H-NMR spectroscopy by comparing the peak area of the 2VP proton at 8.2 ppm with the peak area of the aromatic protons of polystyrene at 6.3-7.2 ppm and EO protons at 3.6 ppm. The composition of the block copolymer can also be determined by titration in acetic acid/$HClO_4$ using crystal violet indicator. Copolymer PDI is determined by SEC.

Solubility:
Poly(styrene-b-2 vinylpyridine-b-ethylene oxide) is soluble in THF, toluene, and $CHCl_3$. The triblock copolymer can also be solubilized in methanol, ethanol depending on its composition. The polymer readily precipitates from hexanes, ether and water.

^{1}H-NMR Spectrum of the product



SEC of the polymer:



DSC thermograms for the polymer: