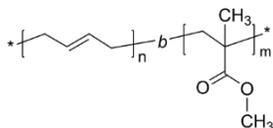


Sample Name: Poly(1,4-butadiene)-b-poly(methyl methacrylate)

Sample #: P44355A-R-BdMMA

Structure:

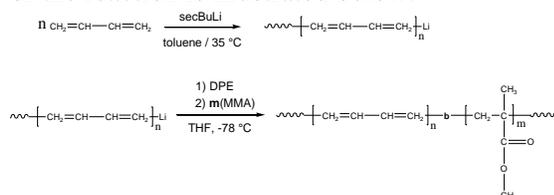


Composition:

Mn × 10 ³ [Bd-b-MMA]	Mw/Mn
93-b-114	1.26

Synthesis Procedure:

Poly(butadiene-*b*-methyl methacrylate) is prepared by living anionic polymerization by sequence addition of butadiene (Bd) followed by methyl methacrylate monomer (MMA). For 1,4-rich addition of polybutadiene block, the polymerization of Bd monomer was carried out in toluene followed by changing the polarity of the medium by introduction of freshly distilled THF, followed by addition of MMA monomer. Polybutadiene macroanion was end-capped with a unit of diphenyl ethylene. Polymerization scheme of the reaction is illustrated below:



Characterization:

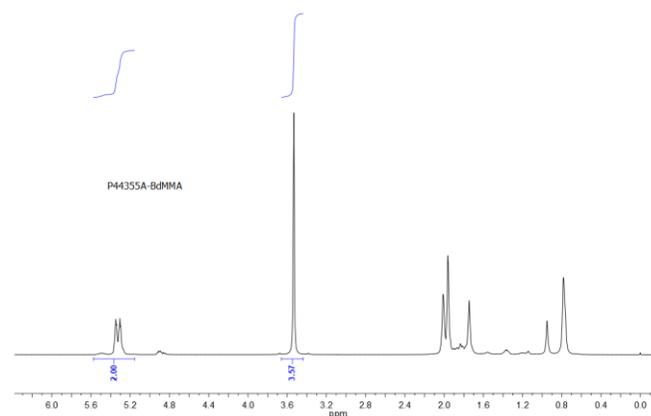
An aliquot of the anionic polybutadiene block was terminated before addition of methyl methacrylate and analyzed by size exclusion chromatography (SEC) equipped with a triple detector to obtain the molecular weight of the first block and polydispersity index (PDI). The final block copolymer composition was calculated from ¹H-NMR spectroscopy by comparing the peak area of the vinylic butadiene protons between about 5.0–5.4 ppm with the methyl methacrylate protons at 3.6 ppm. Block copolymer PDI is determined by SEC.

Note: The ¹H-NMR of 1,2-polybutadiene is composed of 1 proton signal at 5.4 ppm and 2 proton signals at 5.0 ppm. Signals due to vinylic 1,4-polybutadiene are also present at 5.4 ppm.

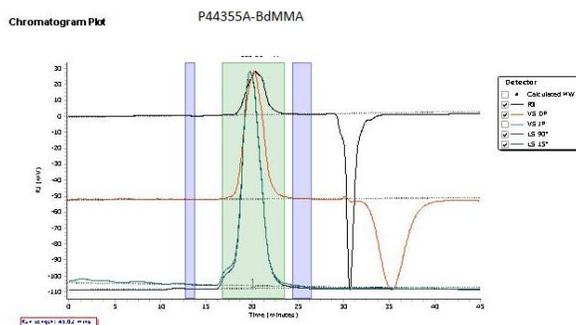
Solubility:

Poly(butadiene-*b*-methyl methacrylate) is soluble in THF, chloroform, toluene, dioxane. The polymer precipitates from ethanol, methanol.

¹H-NMR spectrum of the Sample:



SEC chromatogram of the Sample:



Molecular Weight Averages							PDI
Peak	Mp (g/mol)	Mn (g/mol)	Mw (g/mol)	Mz (g/mol)	Mz+1 (g/mol)	Mv (g/mol)	
Peak 1	242047	207481	262269	326204	411686	308377	1.266