

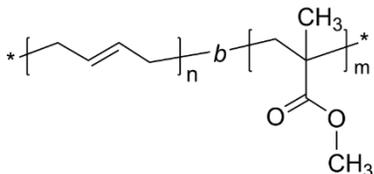
Sample Name:

Poly(butadiene-b-methyl methacrylate)

Polybutadiene is rich in 1,4-microstructure.

Sample ID: P44345-BdMMA

Structure:

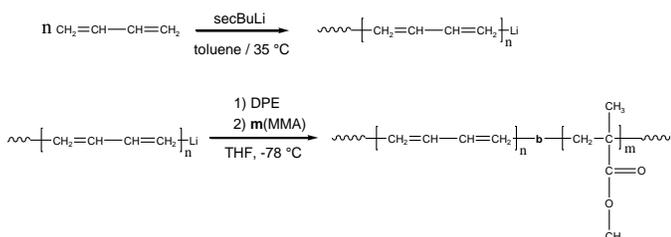


Composition:

$M_n \times 10^3$ [Bd-b-MMA]	Mw/Mn
96.0-b-11.0	1.02

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:

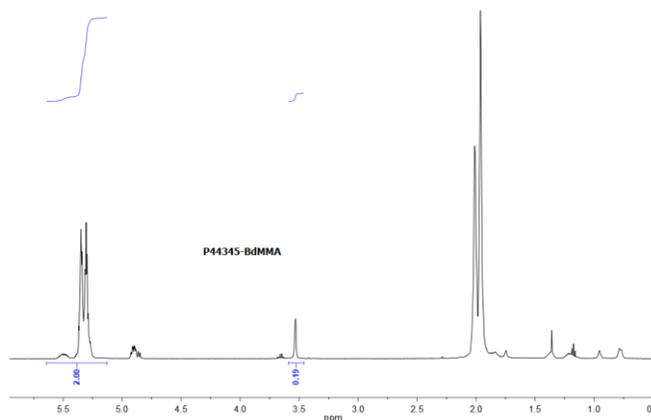
An aliquot of the anionic polybutadiene block was terminated before addition of methyl methacrylate and analyzed by size exclusion chromatography (SEC) equipped with a triple detector to obtain the molecular weight of the first block and polydispersity index (PDI). The final block copolymer composition was calculated from $^1\text{H-NMR}$ 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 $^1\text{H-NMR}$ 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.

$^1\text{H-NMR}$ spectrum of the Sample:



SEC chromatograms:

