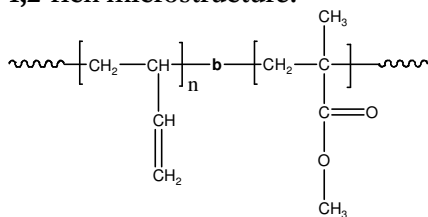


Sample Name: Poly(butadiene -b-methyl methacrylate)

Polybutadiene rich in 1, 2 microstructure

Sample #: P2032-BdMMA

1,2-rich microstructure:



Composition:

Mn × 10 ³ Bd-b-MMA	PDI
91.0-b-191.6	1.10
T _g for Bd block: -15°C	T _g for MMA block: 133°C

Synthesis Procedure:

Poly(butadiene (1,2 addition)-b-methyl methacrylate) is prepared by living anionic polymerization with sequence addition of butadiene (Bd) followed by methyl methacrylate monomer (MMA). Poly butadiene macroanions were end capped with a unit of diphenyl ethylene.

Characterization:

An aliquot of the anionic polybutadiene block was terminated before addition of methyl methacrylate and analyzed by size exclusion chromatography (SEC) with on line-triple detectors to obtain the molecular weight 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.

Thermal analysis:

Thermal analysis of the samples was carried out on a TA Q100 differential scanning calorimeter at a heating rate of 10°C/min. The midpoint of the slope change of the heat flow plot of the second heating scan was considered as the glass transition temperature (T_g).

Solubility:

Poly(butadiene-b-methyl methacrylate) is soluble in THF, CHCl₃, toluene, dioxane. The polymer can be precipitate out in ethanol, methanol.

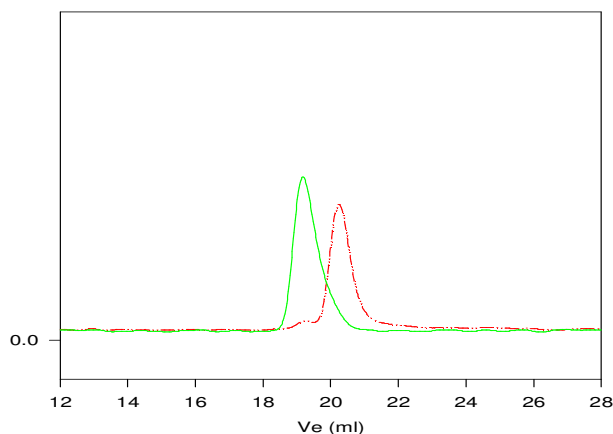
¹H-NMR Spectrum of the block copolymer:



SEC of the block copolymer:

P2032-BdMMA

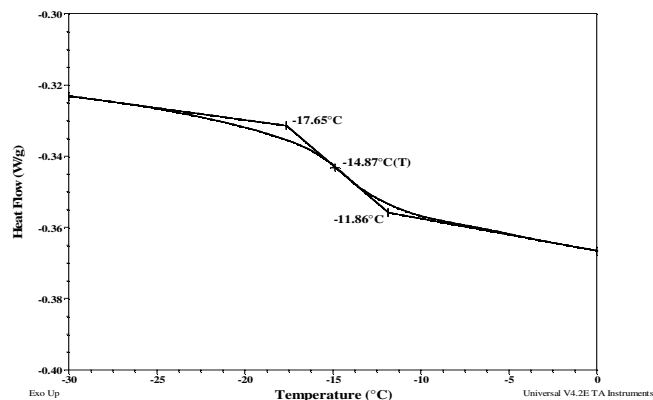
Poly butadiene rich in 1,2 addition



SEC profile of the Block copolymer:

— Polybutadiene, M_n=91000, M_w=94600, PI=1.04
— Diblock Copolymer PBd(91000)-b-PMMA(191600), PI=1.10

DSC thermogram for Bd block:



DSC thermohram for MMA block:

