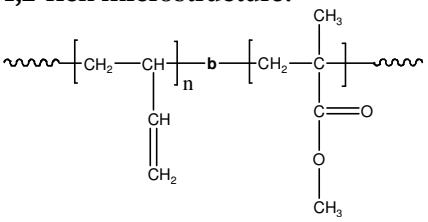
Sample Name: Poly(butadiene -b-methyl methacrylate)
Polybutadiene rich in 1,2 microstructure

Sample #: P2026-BdMMA

1,2-rich microstructure:



Composition:

Mn × 10^3 Bd-b-MMA	PDI
100.0-b-355.0	1.18
T_g for Bd block: -16°C	T_g for MMA block: 134°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 ^{1}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}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.

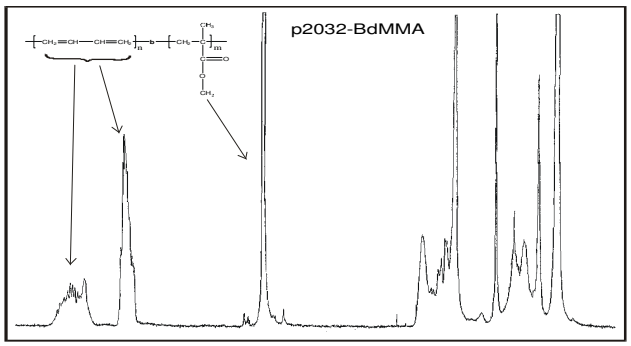
Thermal analysis:

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).

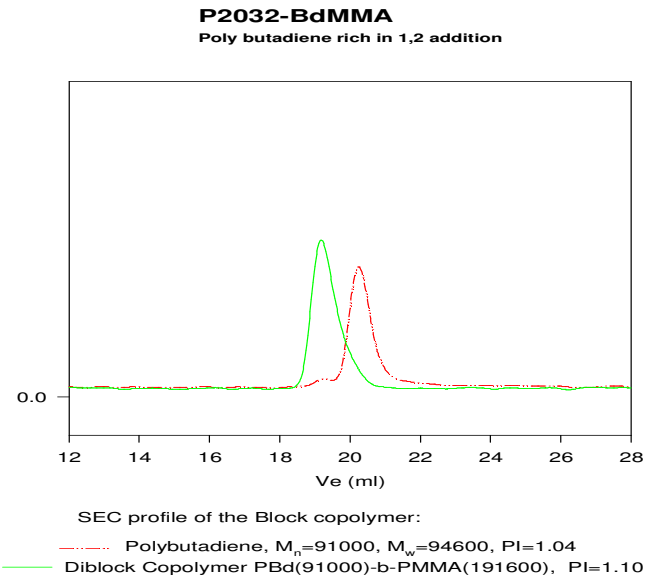
Solubility:

Poly(butadiene-b-methyl methacrylate) is soluble in THF, $CHCl_3$, toluene, dioxane. The polymer can be precipitate out in ethanol, methanol.

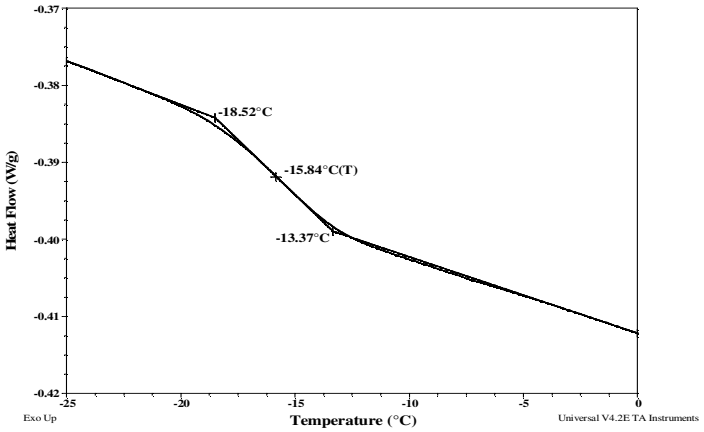
^{1}H-NMR Spectrum of the block copolymer:



SEC of the block copolymer:



DSC thermogram for Bd block:



DSC thermogram for MMA block;