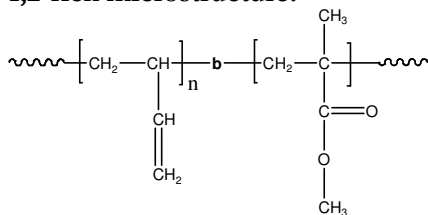


**Sample Name:** Poly(butadiene -b-methyl methacrylate)

Polybutadiene rich in 1,2 microstructure

**Sample #:** P2286-BdMMA

**1,2-rich microstructure:**



**Composition:**

Mn x 10 <sup>3</sup> Bd-b-MMA	PDI
105.0-b-490.0	1.10
T <sub>g</sub> for Bd block: -17°C	T <sub>g</sub> for MMA block: 135°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 <sup>1</sup>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 <sup>1</sup>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.

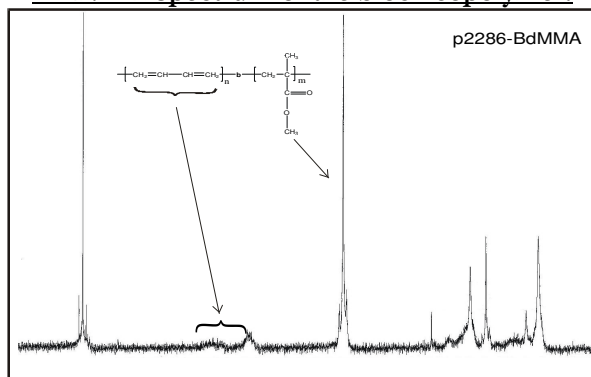
**Thermal analysis:**

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<sub>g</sub>).

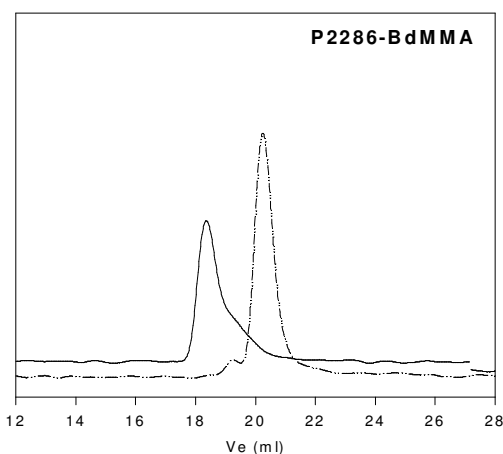
**Solubility:**

Poly(butadiene-b-methyl methacrylate) is soluble in THF, CHCl<sub>3</sub>, toluene, dioxane. The polymer can be precipitate out in ethanol, methanol.

**<sup>1</sup>H-NMR Spectrum of the block copolymer:**



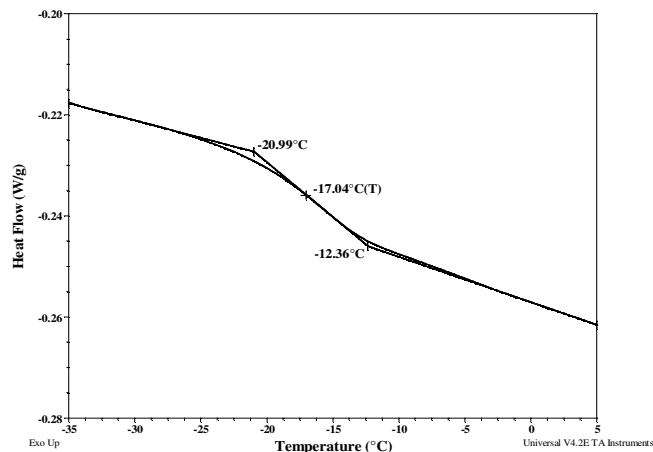
**SEC of the block copolymer:**



SEC profile of the Block copolymer:

..... Polybutadiene, M<sub>n</sub>=105000, M<sub>w</sub>=113400, PI=1.08  
 — Diblock Copolymer PBd(105000)-b-PMMA(490000), PI=1.10

**DSC thermogram for Bd block:**



**DSC thermogram for MMA block:**

