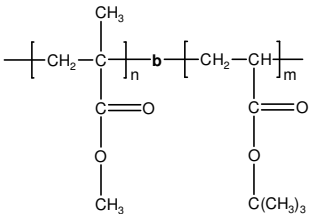
Sample Name: Poly(methyl methacrylate-b-t-butyl acrylate)

Sample #: P4986-MMAtBuA

Structure:



Composition:

Mn x 10^3 PMMA-b-PtBuA	PDI
65.0-120.0	1.15

Glass transition temperature at a glance

T_g for MMA block	Not distinct
T_g for tBuA block	42°C

Synthesis Procedure:

Poly(methyl methacrylate-b-t-butyl acrylate) is prepared by living anionic polymerization with sequence addition of methyl methacrylate followed by addition of t-butyl acrylate or vice versa.

Characterization:

An aliquot of the anionic poly(methyl methacrylate) block was terminated before addition of t-butyl acrylate and analyzed by size exclusion chromatography (SEC) 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 t-butyl methacrylate protons at 1.43 ppm with the peak area of the methyl methacrylate protons at 3.6 ppm. Copolymer PDI is determined by SEC.

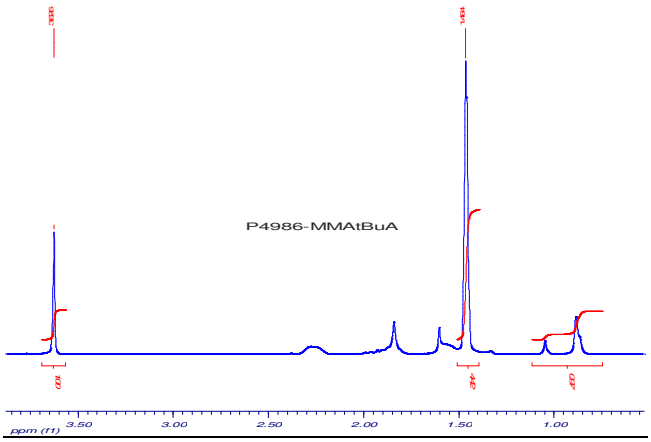
Thermal analysis

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).

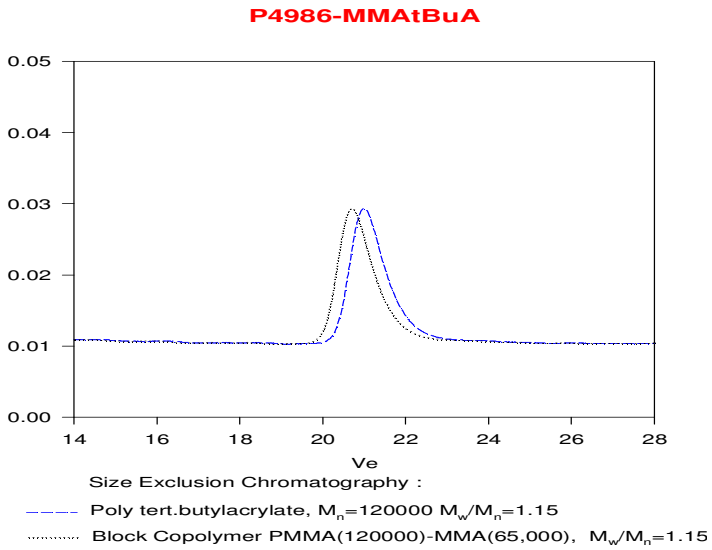
Solubility:

Poly(methyl methacrylate-b-t-butyl methacrylate) is soluble in THF, $CHCl_3$, toluene and dioxane. The polymer precipitates from hexanes, methanol and ethanol.

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



SEC of the block copolymer:



Thermogram of tBuA block: