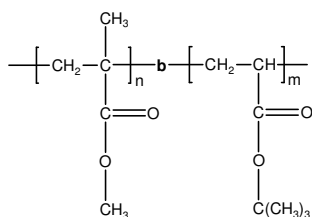


Sample Name: Poly(methyl methacrylate-*b*-*t*-butyl acrylate)

Sample #: P8345-MMA*t*BuA

Structure:



Composition:

Mn x 10 ³ PMMA- <i>b</i> - <i>t</i> BuA	PDI
6.0- <i>b</i> -10.5	2.0
T _g for MMA block	69°C
T _g for <i>t</i> BuA block	Not distinct

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.

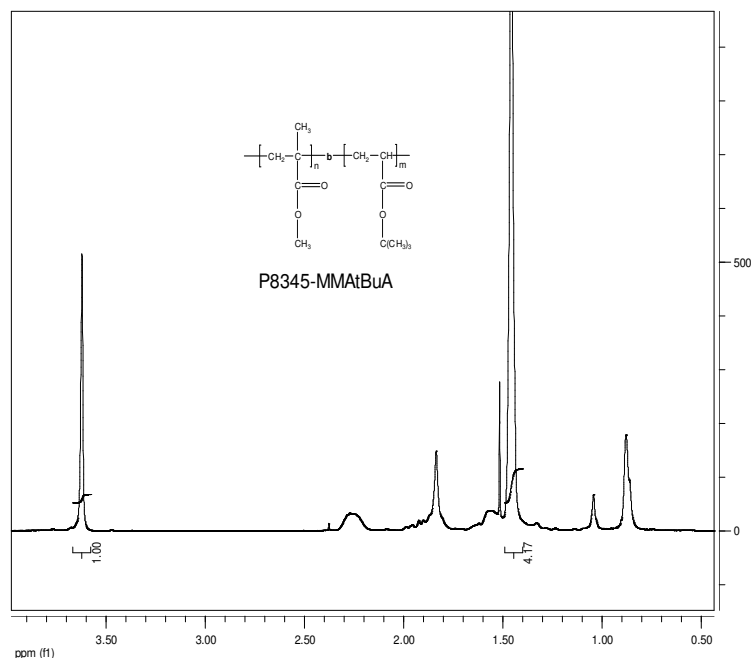
Characterization:

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 ¹H-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.

Solubility:

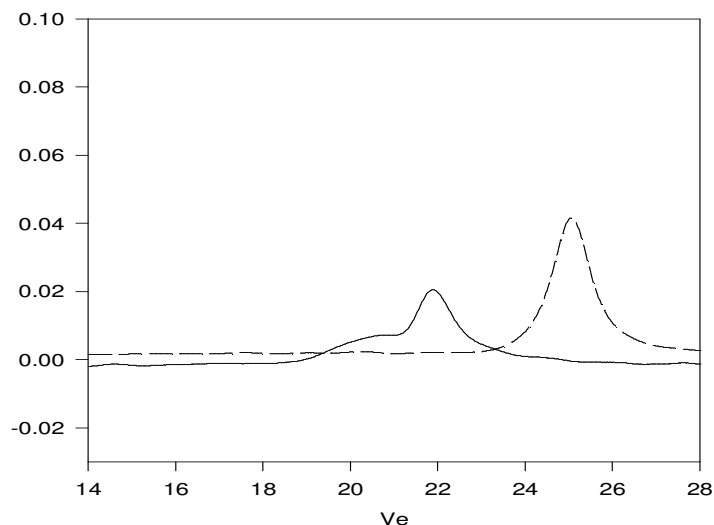
Poly(methyl methacrylate-*b*-*t*-butyl methacrylate) is soluble in THF, CHCl₃, toluene and dioxane. The polymer precipitates from hexanes, methanol and ethanol.

¹H-NMR Spectrum of the block copolymer:



SEC of the block copolymer:

P8345-MMA*t*BuA



Size Exclusion Chromatography :

- Poly methylmethacrylate, M_n = 6000 Mw: 6500 M_w/M_n = 1.08
- Block Copolymer PMMA(6000)-*t*BuA(10500), M_w/M_n = 2.0

:

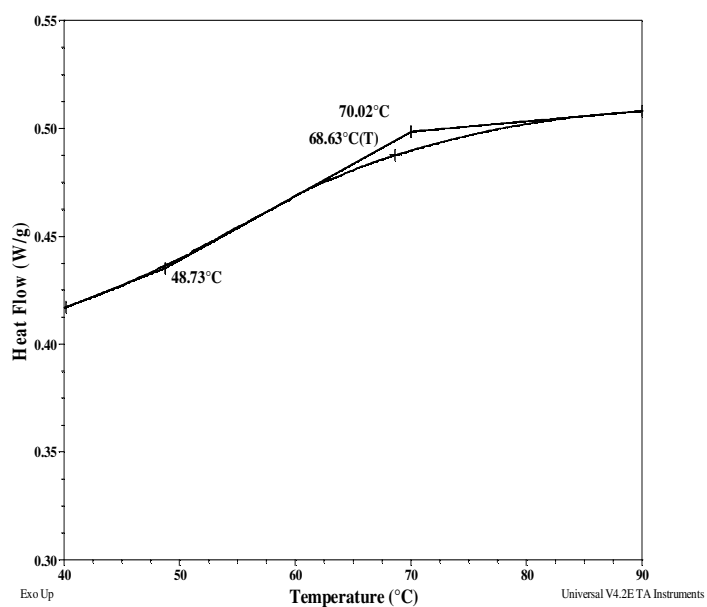
Thermal analysis of sample P8345-MMAAtBuA

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).

Glass transition temperature at a glance

T_g for MMA block	69°C
T_g for tBuA block	26°C

Thermogram of MMA block:



Thermogram for tBuA block

