Sample Name: Poly(styrene-b-t-butyl methacrylate)
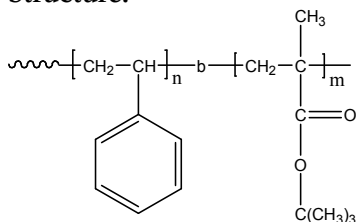
Sample #: P10025-StBuMA

Structure:

Composition:

Mn x 10³ S-b-tBuMA	Mw/Mn (PDI)
8.0-b-22.5	1.5

Glass transition temperature at a glance

T_g for PS block	Not distinct
T_g for tBuMA block	122ºC

Synthesis Procedure:

Poly(styrene-b-t-butyl methacrylate) is prepared by anionic polymerization with sequence addition of styrene followed by t-butyl methacrylate.

Characterization:

An aliquot of the polystyrene block was terminated before addition of t-butyl methacrylate 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 styrene protons at 6.3-7.2 ppm with the peak area of t-butyl methacrylate protons at 1.43 ppm. Block copolymer PDI is determined by SEC.
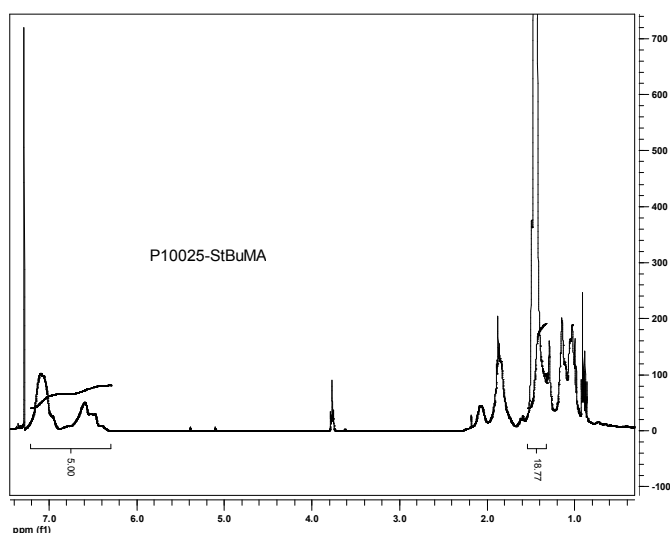
Thermal analysis

Thermal analysis of the samples was carried out on a TA Q100 differential scanning calorimeter at a heating rate of 10ºC/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).
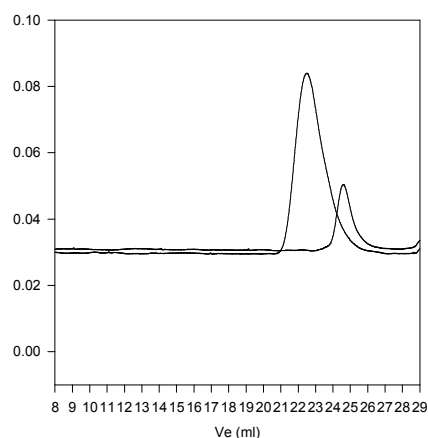
Solubility:

Poly(styrene-b-t-butyl methacrylate) is soluble in THF, dioxane, CHCl₃.

¹H NMR spectrum of the sample

P10025-StBuMA

SEC profile of the block copolymer
P10025-StBuMA

Size exclusion chromatography of polystyrene-b-poly(t-butyl methacrylate)

—— Polystyrene, M_n=8000, M_w=9200, PI=1.15
—— Block Copolymer PS(8000)-b-PtBuMA(22500), PI=1.5

Thermogram for tBuMA block