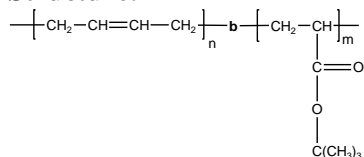


Sample Name:

Poly (1, 4-butadiene -b- tert.butylacrylate)

Sample #: **P2321-BdtBuA**

Structure:

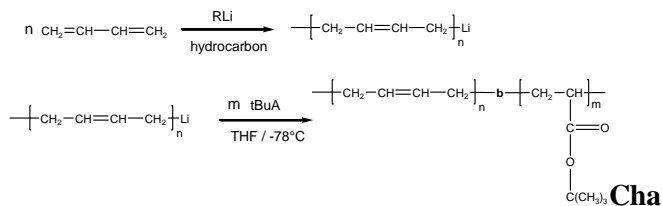


Composition:

Mn x 10 ³ PBd-b-tBuA	PDI
11.0-b-6.0	1.2
T _g for tBuA block (°C)	18
T _g for 1,4 Bd block (°C)	Not distinct

Synthesis Procedure:

Poly (1, 4-butadiene-b-t-butyl acrylate) is prepared by living anionic polymerization with sequence addition of butadiene followed by t-butyl acrylate. The reaction scheme is shown below:



Characterization:

An aliquot of the anionic poly (butadiene) 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 vinylic butadiene protons at about 5.4 ppm with the t-butyl protons at 1.43 ppm. Block copolymer PDI is determined by SEC.

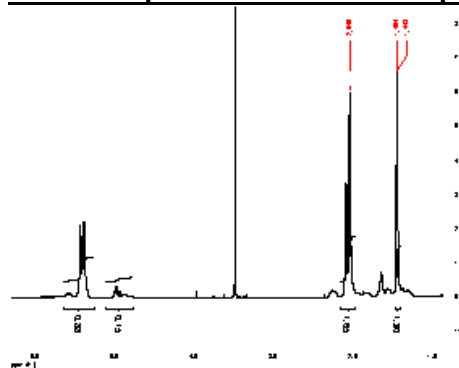
Thermal analysis:

Thermal analysis of the samples was carried out on a TA Q100 differential scanning calorimeter at a heating rate of 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:

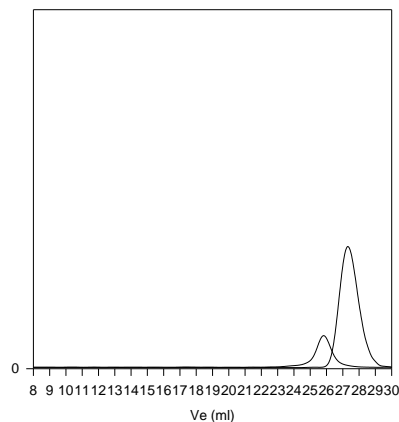
Polymer is soluble in THF, CHCl₃, dioxane and benzene.

¹H-NMR Spectrum of the block copolymer:



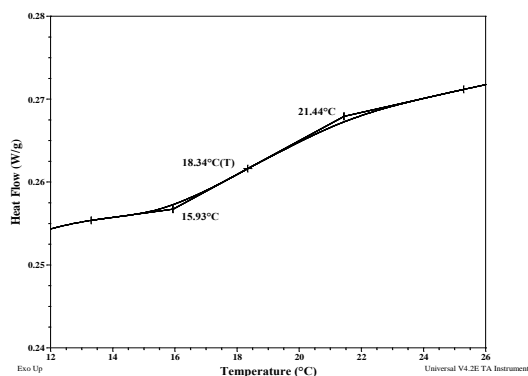
SEC of the block copolymer:

P2321-Bd, 1,4 rich addition tBuA



— SEC profile of Poly(Butadiene 1,4 addition-b-tert. butylacrylate):
— Polybutadiene, M_n=11,000, M_w=11,500, PI=1.05
Block Copolymer PBd(11,000)-b-PtBuA(6,000), PI=1.2
(Composition from ¹H NMR)

DSC thermogram for the sample:



References for further information:

1. S. K. Varshney, R. Fayt, Ph. Teyssie, and J.P. Hautekeer US Patent 5,264,527 (1993)
2. Ph. Teyssie, Ph. Bayard, R. Jerome, S. K. Varshney, and J. S. Wang, *35th IUPAC International Union of Pure & Applied Chemistry International Symposium on Macromolecules* 1994, 67.