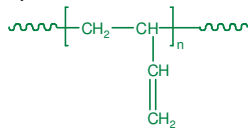


Sample Name: Polybutadiene
(rich in 1,2 microstructure)
(1,2=85% trans-1,4 =9% , cis 1,4 = 6%)

Sample #: P2481-Bd

1,2 rich microstructure: (>85%)



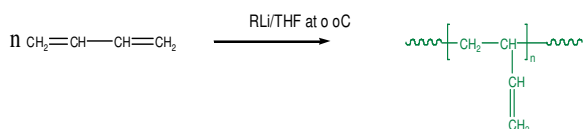
Composition:

$M_n \times 10^3$	PDI
50.0	1.06
T_g (°C)	-56

Synthesis Procedure:

Polybutadiene (1,2-rich) is obtained by living anionic polymerization in THF. The reaction scheme is shown below:

1,2 addition:



Characterization:

The molecular weight and polydispersity index (PDI) are obtained by size exclusion chromatography (SEC) in THF. SEC analysis was performed on a Varian liquid chromatograph equipped with refractive and UV light scattering detectors. Three SEC columns from Supelco (G6000-4000-2000 HXL) were used with triple detectors from Viscotek Co.

Polymer microstructure can be confirmed by ^1H -NMR where the spectrum of 1,2-polybutadiene contains of 1 vinylic proton signal at 5.4 ppm and 2 vinylic protons at 5.0 ppm but the spectrum of 1,4-polybutadiene only contains vinylic signals at 5.4 ppm.

Thermal analysis:

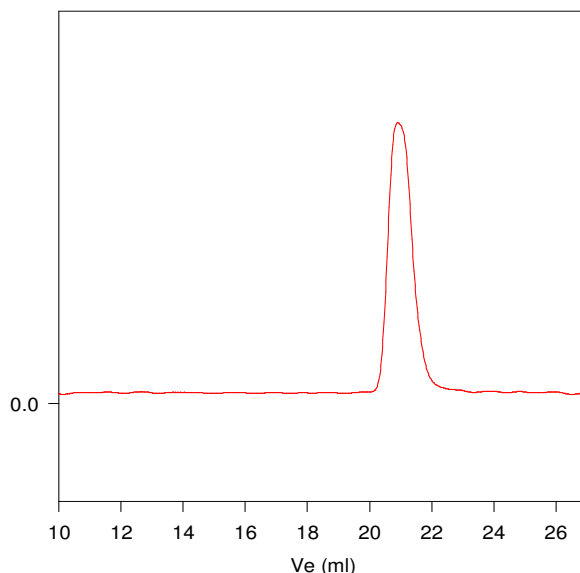
Thermal analysis of the samples was carried out on a TA Q100 differential scanning calorimeter at a heating rate of 10°C/min. The midpoint of the slope change of the heat flow plot of the second heating scan was considered as the glass transition temperature (T_g).

Solubility:

Polybutadiene is soluble in THF, toluene, hexane, pentane and cyclohexane and precipitates from methanol and ethanol.

SEC of Homopolymer

P2481-Bd (rich in 1,2 microstructure)



Size exclusion chromatography of polybutadiene
Rich in 1,2 addition:

$M_n=50000$, $M_w=53000$, $M_w/M_n=1.06$

Thermogram of the polymer

