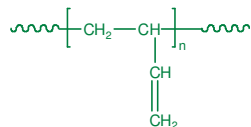


**Sample Name:** Polybutadiene  
(rich in 1,2 microstructure)  
(1,2=82.5%)

**Sample #:** P2409-Bd

1,2 rich microstructure: (>85%)



#### Composition:

| $M_n \times 10^3$ | PDI  |
|-------------------|------|
| 48.5              | 1.06 |
| $T_g$ (°C)        | -14  |

#### Synthesis Procedure:

Polybutadiene (bearing different contents of 1,2 addition) is obtained by living anionic polymerization in THF.

#### 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  $^1\text{H-NMR}$  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:

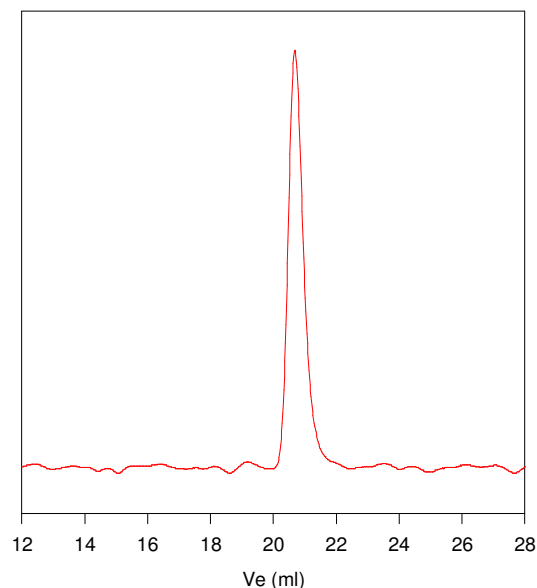
Thermal analysis of the samples was carried out on a TA Q100 differential scanning calorimeter at a heating rate of 10°C/min. The midpoint of the slope change of the heat flow plot of the second heating scan was considered as the glass transition temperature ( $T_g$ ).

#### Solubility:

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

SEC for the polymer:

**P2409-Bd**



Size exclusion chromatography of polybutadiene:  
(with respect to polybutadiene standards)

$M_n=48500$ ,  $M_w=57300$ ,  $M_w/M_n=1.06$   
(1,2 addition >88%)

#### Thermogram for the polymer

