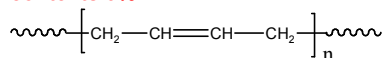


Sample Name: Polybutadiene
(rich in 1,4 microstructure)

Sample #: P10070-Bd

1,4 rich microstructure (cis 68%, trans 27% and 1,2 contents 5%)



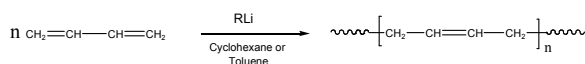
Composition:

Mn x 10 ³	PDI
50.0	1.06

Synthesis Procedure:

Polybutadiene (1,4-rich microstructure) is obtained by living anionic polymerization in toluene or cyclohexane. The reaction scheme is shown below:

1,4 addition:



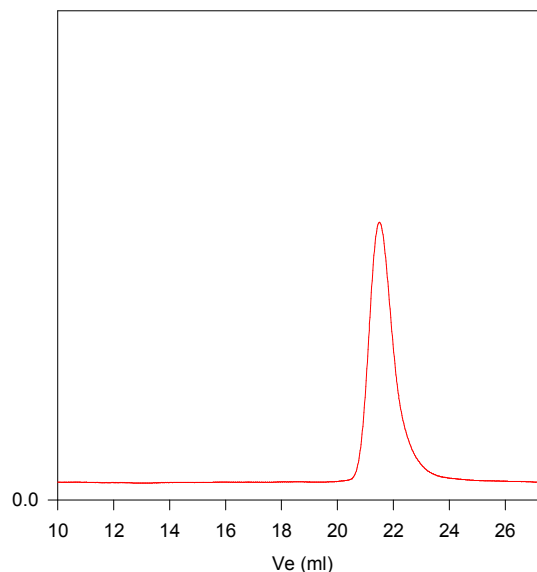
Characterization:

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.

Solubility:

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

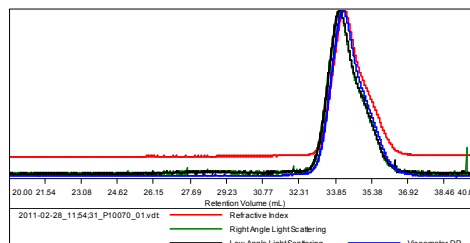


Size exclusion chromatography of polybutadiene:

$$M_n=50,000 \quad M_w=53,000, \quad M_w/M_n=1.06$$

Sample ID: P10070

Concentration (mg/ml)	4.2000
Sample dn/dc (dl/g)	0.1262
Method File	PS80-Jan192011-0000.vcm
Column Set	3x PL 1113-6300
System	System 1



Sample	MW Number Average (Daltons)	MW Weight Average (Daltons)	MW Z-Average (Daltons)	Polydispersity	Intrinsic Viscosity (dl/g)	Hydrodynamic Radius (nm)
2011-02-28_115431_P10070_01.vst	42.638	45.387	48.981	1.064	1.2340	12.48

