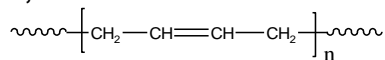


**Sample Name: Polybutadiene**  
(rich in 1,4 microstructure)

**Sample #: P18318A-Bd**  
1,4 rich microstructure (cis 68%, trans 27%  
and 1,2 contents 5%)

**1,4 rich microstructure:**



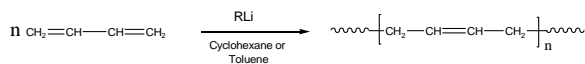
**Composition:**

Mn x 10 <sup>3</sup>	PDI
70.5	1.03

**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:**



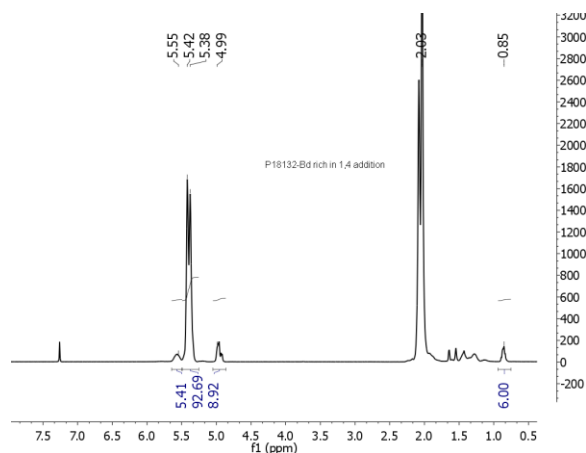
**Characterization:**

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 <sup>1</sup>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.

**Solubility:**

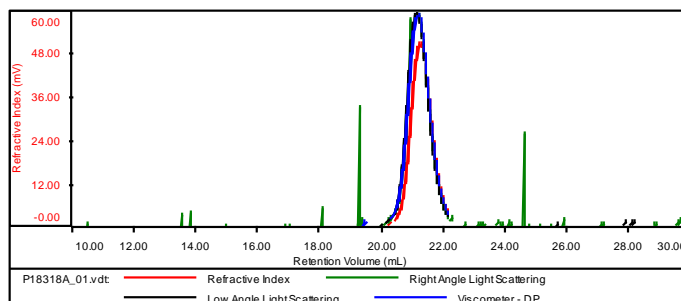
Polybutadiene is soluble in THF, toluene, hexane, pentane and cyclohexane and precipitates from methanol and ethanol.



## SEC of Homopolymer

**Sample ID: P18318A-Bd**

Concentration (mg/mL)	1.5765
Sample dn/dc (mL/g)	0.1270
Method File	PS80K-NOV25-2013-0000.vcm
Column Set	3x PL 1113-6300
System	System 1



Sample	Mn	Mw	Mp	Mw/Mn	IV
P18318A_01.vdt	70,409	72,633	71,271	1.032	1.1523

