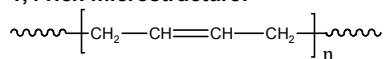


**Sample Name: Polybutadiene**  
**(rich in 1,4 microstructure)**

**Sample #: P10495-Bd**  
**1,4 rich microstructure (cis 68%, trans 27% and 1,2 contents 5%)**

**1,4 rich microstructure:**



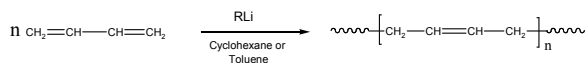
**Composition:**

Mn x 10 <sup>3</sup>	PDI
4.5	1.08

**Synthesis Procedure:**

Polybutadiene (1,4-rich) 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.

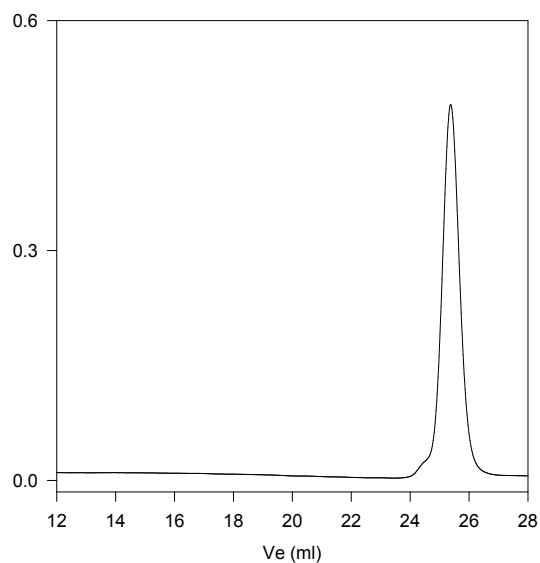
Polymer microstructure can be confirmed by <sup>1</sup>H-NMR where the spectrum of 1,2-polybutadiene contains of 1 vinylic proton signal at 5.4 ppm and 2 vinylic protons at 5.0 ppm but the spectrum of 1,4-polybutadiene only contains vinylic signals at 5.4 ppm.

**Solubility:**

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

**SEC of the Product**

**P10495-Bd(1,4 rich addition)**



Size exclusion chromatography of polybutadiene:

M<sub>w</sub> = 4500, M<sub>n</sub> = 4900, M<sub>w</sub>/M<sub>n</sub> = 1.08

Solution viscosity in THF at 30 °C: 0.245 dl/g

Radius of Gyration : 3.2 nm

Data obtained from Viscotek triple detectors

