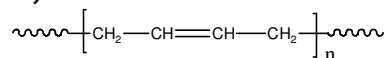


Sample Name: **Polybutadiene**  
(rich in 1,4 microstructure)

Sample #: **P4975-Bd**

**1,4 rich microstructure:**



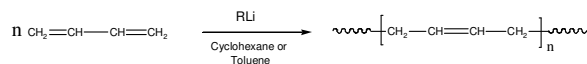
**Composition:**

Mn x 10 <sup>3</sup>	PDI
15.0	1.05

**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.

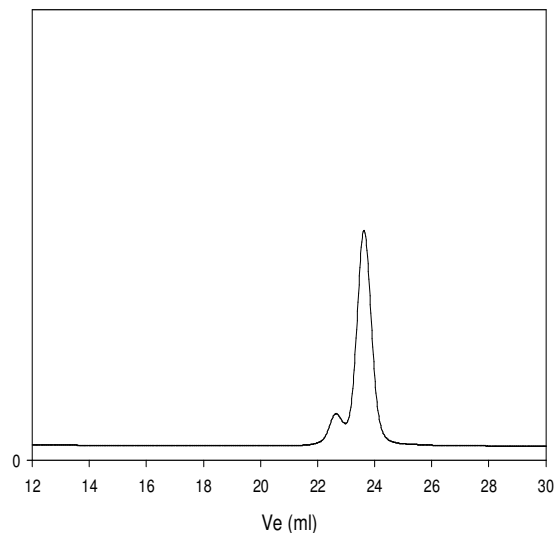
Polymer microstructure can be confirmed by <sup>1</sup>H-NMR where the spectrum of 1,2-polybutadiene contains of 1 vinylic proton signal at 5.4 ppm and 2 vinylic protons at 5.0 ppm but the spectrum of 1,4-polybutadiene only contains vinylic signals at 5.4 ppm.

**Solubility:**

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

**SEC of Homopolymer**

P4975-Bd



Size exclusion chromatography of polybutadiene (1,4 addition)

Mn=15000, Mw=16000, PI=1.05

Contain about 10% 30000 mole wt poly butadiene fraction

Solution viscosity in THF at 35°C: 0.72 dl/g and radius of gyration 6.36 nm dn/dc in THF at 35 °C: 0.127 ml/g