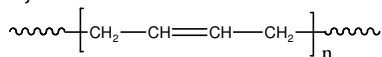


Sample Name: Polybutadiene
(rich in 1,4 microstructure)

Sample #: P19149-Bd
1,4 rich microstructure (cis 68%, trans 27%
and 1,2 contents 5%

1,4 rich microstructure:



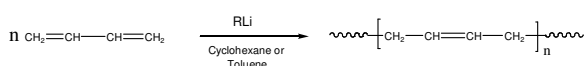
Composition:

Mn x 10 ³	PDI
5.5	1.07

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:

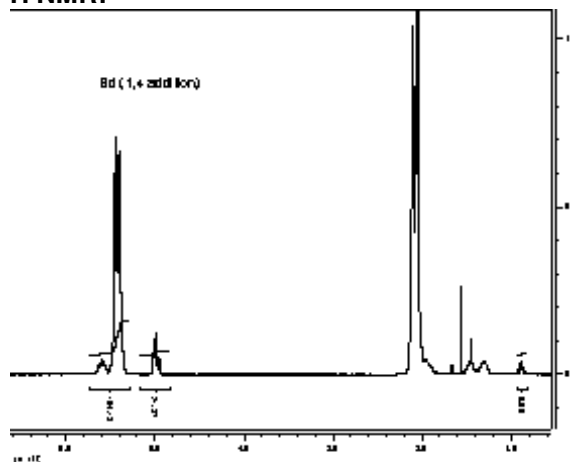
The molecular weight and polydispersity index (PDI) are obtained by size exclusion chromatography (SEC) in THF. SEC analysis was performed on a Varian liquid chromatograph equipped with refractive and UV light scattering detectors. Three SEC columns from Supelco (G6000-4000-2000 HXL) were used with triple 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.

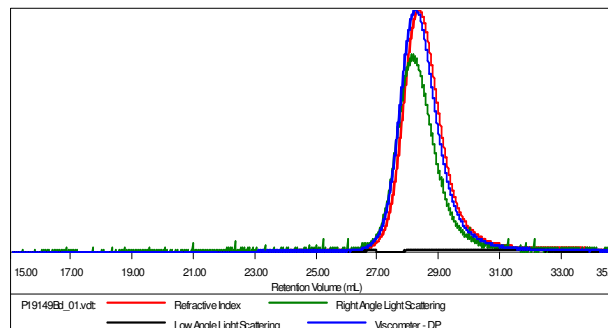
H NMR:



SEC of Homopolymer

Sample ID: P19149-Bd

Concentration (mg/mL)	25.6713
Sample conc (mL/g)	0.1270
Method File	PS80K-March6-2015-0000.vcm
Column Set	3x PL 1113-6300
Solvent	THF



Sample	MW Number Average (Da)	MW Weight Average (Da)	MW at Peak (Da)	Polydispersity	Intrinsic Viscosity (dL/g)
P19149Bd_01.vcl	5,427	5,794	5,584	1.068	0.1304