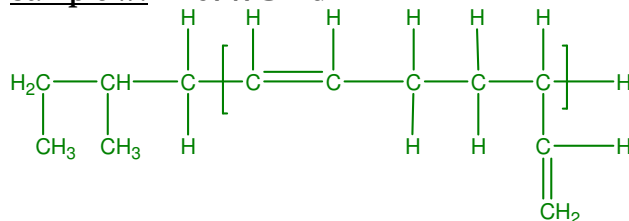


Sample Name: Polybutadiene
(rich in 1,4 microstructure)
(1,2=35% , 1,4 = 65%)

Sample #: P18747C-Bd

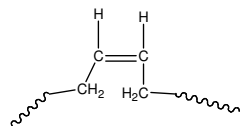


Composition:

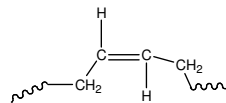
| Mn x 10 ³ | PDI |
|-----------------------------|-------|
| 170.0 | 1.12 |
| 1,2 addition : 1,4 addition | 35:65 |
| Cis 1,4 and trans 1,4 | 24:76 |

Synthesis Procedure:

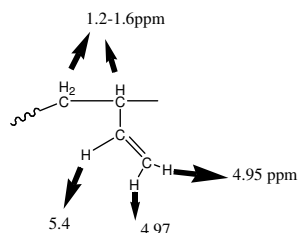
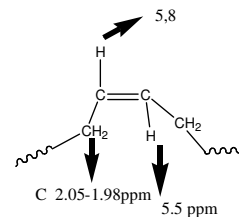
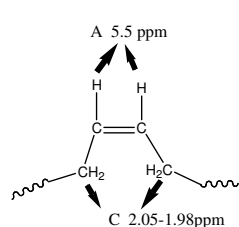
Polybutadiene (1,2-rich) is obtained by living anionic polymerization in cyclohexane with a known amount of THF using secBuLi as the initiator.



Cis 1,4 addition



Trans 1,4 addition



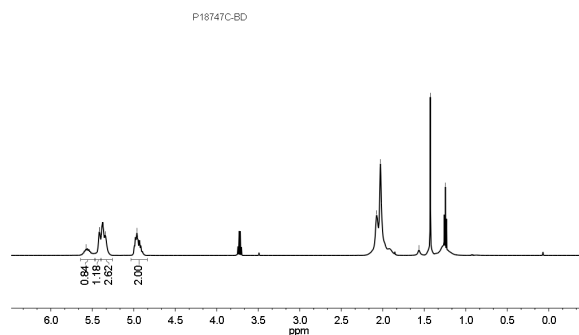
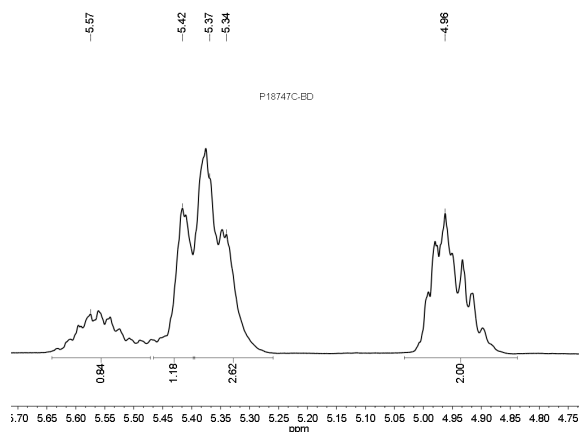
Characterization:

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

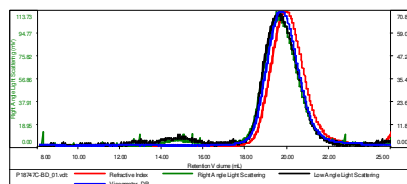
contains of 1 vinylic proton signal at 5.4 ppm and 2 vinylic protons at 5.0 ppm but the spectrum of 1,4-polybutadiene only contains vinylic signals at 5.4 ppm.

¹H NMR:



Sample ID: P18747C-Bd

| | |
|-----------------------|----------------------------|
| Concentration (mg/mL) | 13.3390 |
| Sample dn/dc (mL/g) | 0.1270 |
| Method File | PS30K-June14-2014-0001.vcm |
| Column Set | 3x PL 1113-6000 |
| Solvent | THF |



| Sample | Mn | Mw | Mp | Mw/Mn | IV |
|-------------------|---------|---------|---------|-------|--------|
| P18747C-BD_01.vot | 169,838 | 190,231 | 178,485 | 1.120 | 0.6967 |

