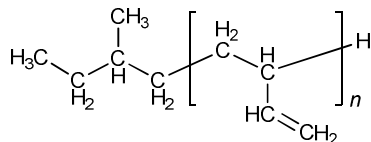


Sample Name:

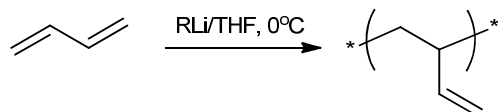
Polybutadiene (rich in 1,2 microstructure, 89%)

Sample # P4839-Bd**Structure:****Composition:**

$M_n \times 10^3$ (g/mol)	M_w/M_n (PDI)
6.5	1.05
T_g ($^{\circ}\text{C}$)	-15

Synthesis Procedure:

Polybutadiene (1,2-rich) is obtained by living anionic polymerization in THF. The reaction scheme is shown below:

**Characterization:**

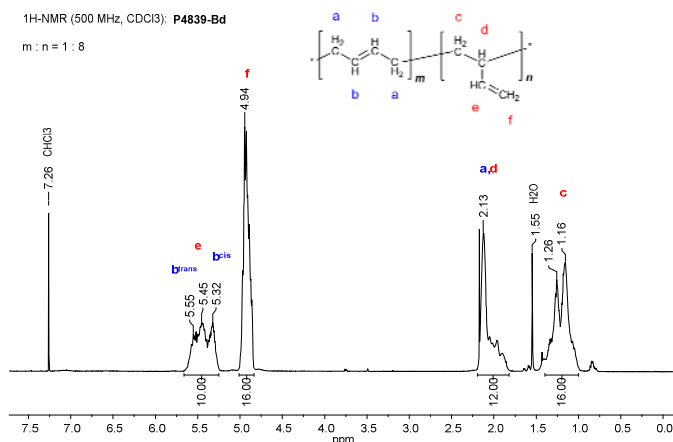
The molecular weight and polydispersity index (PDI) were obtained by size exclusion chromatography (SEC) in THF. SEC analysis was performed on a Varian liquid chromatograph equipped with refractive and UV light scattering detectors. Three SEC columns from Supelco (G6000-4000-2000 HXL) were used with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

Polymer microstructure was calculated from $^1\text{H-NMR}$ spectrum by comparison of ratio between characteristic vinylic protons at 4.9 ppm (1,2-polybutadiene) and 5.3–5.5 ppm (1,4-polybutadiene).

Thermal analysis of the sample was done on a TA Q100 differential scanning calorimeter at a heating rate of $10^{\circ}\text{C}/\text{min}$. The midpoint of the slope change of the heat flow plot of the second heating scan was considered as the glass transition temperature (T_g).

Solubility:

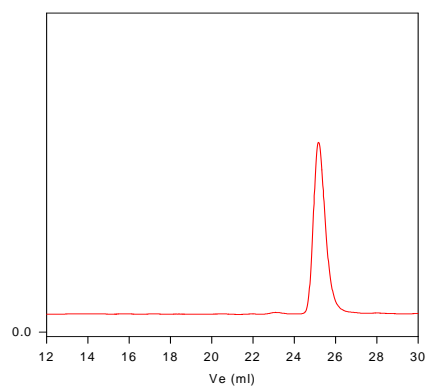
Polybutadiene is soluble in THF, toluene, hexane, pentane, and cyclohexane; and precipitates from methanol and ethanol.

 $^1\text{H NMR}$ spectrum of P4839-Bd:

1,2-Polybutadiene = 89 %

SEC elugram of the polymer:

P4839-Bd (rich in 1,2 addition)



Size exclusion chromatography of polybutadiene with respect to polybutadiene standards:

$M_n=6500$, $M_w=6800$, $M_w/M_n=1.05$

DSC of the polymer: