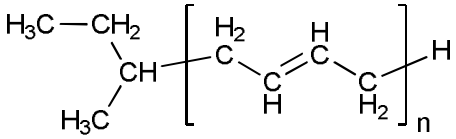
Sample Name:
Polybutadiene (predominantly 1,4-addition)

Sample # **PBd-7**

Structure:



Composition:

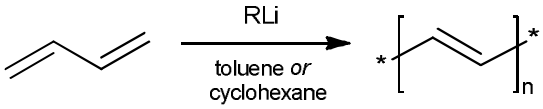
Mn × 10^3 (g/mol)	Mw/Mn
13.7	1.04

Microstructure:

1,4-addition:		1,2-addition
Cis-isomer	*Trans*-isomer	
46 %	46 %	8 %

Synthesis procedure:

1,4-Polybutadiene was prepared by living anionic polymerization in toluene or cyclohexane. A scheme of reaction is presented below.



Characterization:

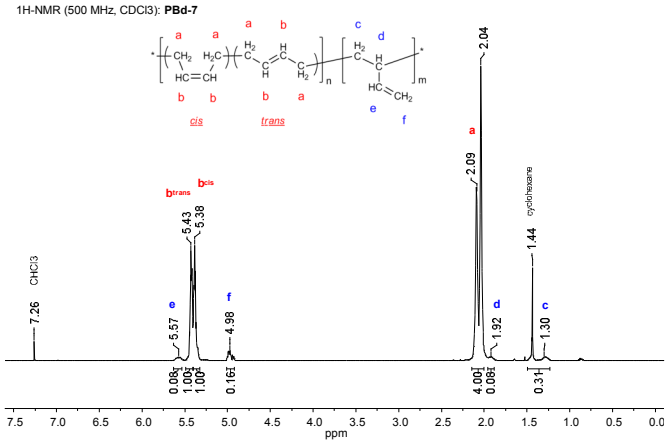
The polybutadiene microstructure was determined by ^{1}H NMR spectroscopy by comparison of characteristic chemical shifts for *cis*-1,4- and *trans*-1,4- isomers, and 1,2-vinyl type of butadiene polymerization.

The molecular weight and polydispersity index (M_w/M_n) of polybutadiene were obtained by size exclusion chromatography (SEC) in THF. SEC analysis was performed on a Varian liquid chromatograph equipped with triple detector (RI, viscometer, light scattering) and SEC columns from Supelco (G6000-4000-2000 HXL).

Solubility:

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

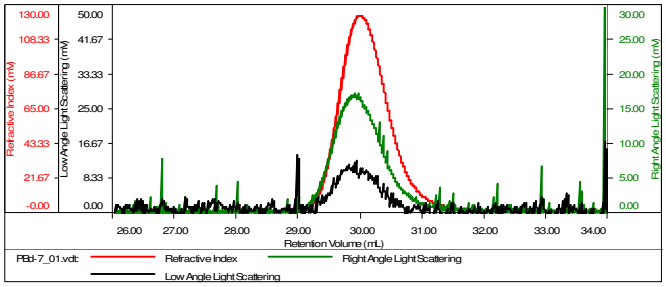
^{1}H NMR spectrum of polybutadiene in $CDCl_3$:



SEC elugram of polybutadiene in THF:

Sample # PBd-7

Concentration (mg/mL)	2.1658
Sample dn/dc (mL/g)	0.1270
Method File	PS80K-April-18-2016-0001.vcm
Column Set	3x PL 1113-6300
Solvent	THF



Sample	Mn (Da)	Mw (Da)	Mw/Mn	IV (dL/g)	Rh (nm)	Ret Vol (mL)
PBd-7_01.vdt	13,728	14,209	1.035	0.4730	5.98	29.970