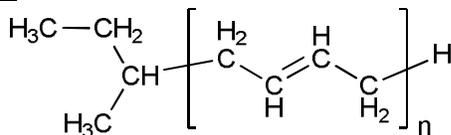


Sample Name:

**Polybutadiene (predominantly 1,4-addition)**

Sample # **P2299-Bd**

Structure:



Composition:

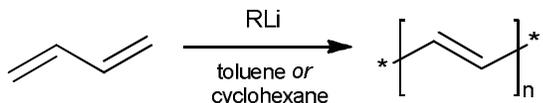
$M_n \times 10^3$ (g/mol)	Mw/Mn
1.9	1.08

Microstructure:

1,4-addition:		1,2-addition
<i>Cis</i> -isomer	<i>Trans</i> -isomer	
49 %	40 %	11 %

Synthesis procedure:

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



Characterization:

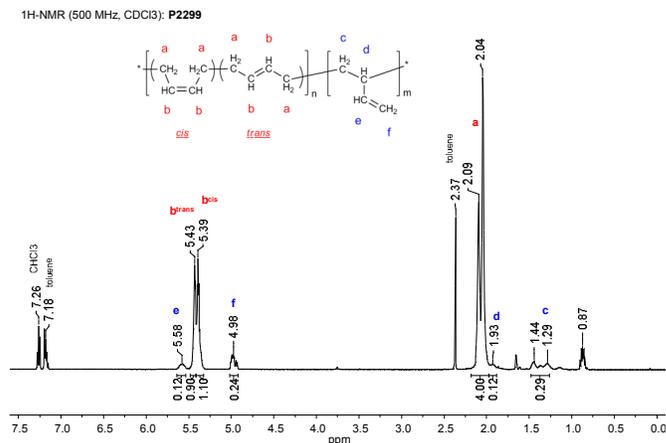
The polybutadiene microstructure was determined by  $^1\text{H}$  NMR spectroscopy by comparison of characteristic chemical shifts for *cis*-1,4- and *trans*-1,4- isomers, and 1,2-vinyl type of butadiene polymerization.

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:

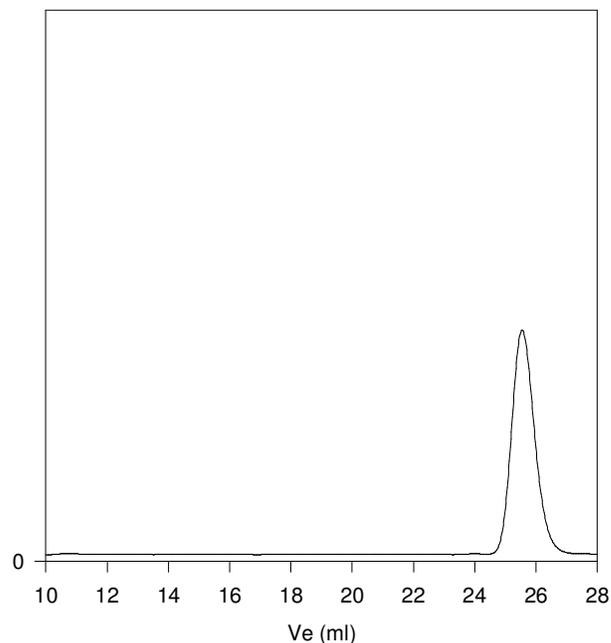
Polybutadiene is soluble in THF, chloroform, toluene, hexane, pentane, cyclohexane; and it precipitates from methanol, ethanol.

**$^1\text{H}$  NMR spectrum of polybutadiene in  $\text{CDCl}_3$ :**



**SEC elugram of polybutadiene in THF:**

**P2299-Bd**



Size exclusion chromatography of polybutadiene:

$M_n=1900$   $M_w=2000$ ,  $M_w/M_n=1.08$