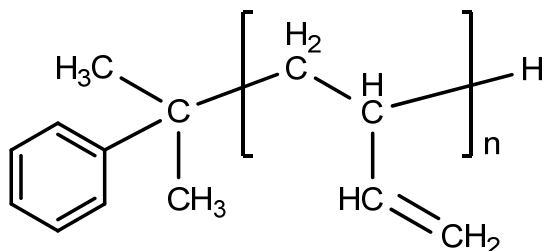


Sample Name: Polybutadiene (1,2-rich addition)

Sample #: P19692-Bd

Structure:



Composition:

Mn x 10 ³	PDI
2.4	1.04
PBd 1,4-addition	20 %
PBd 1,2-addition:	80 %

Synthesis procedure:

1,2-addition polybutadiene was prepared by anionic living polymerization of butadiene in non-polar/polar media.

Characterization:

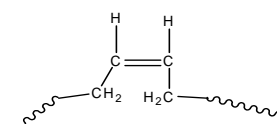
The ratio between 1,4- and 1,2-addition was calculated by ¹H NMR spectroscopy. Molecular weight and polydispersity index were determined by size exclusion chromatography (SEC).

Thermal analysis:

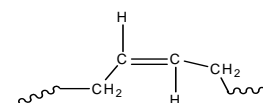
Thermal analysis of the copolymer was performed on a TA Q100 differential scanning calorimeter (DSC) at a heating rate of 10oC/min. The midpoint of the slope change of the heat flow plot of the second heating scan was considered as the glass transition temperature (T_g).

Solubility:

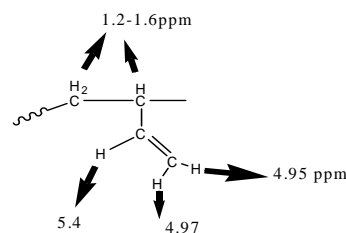
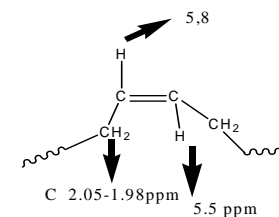
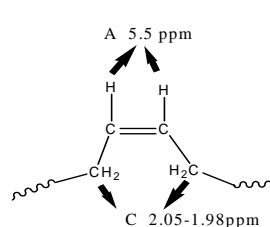
Polybutadiene is soluble in DMF, THF, toluene, hexane, cyclohexane and CHCl₃. It precipitates from methanol, ethanol and water.



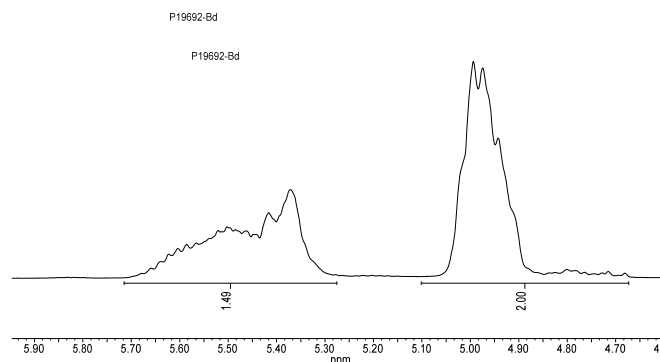
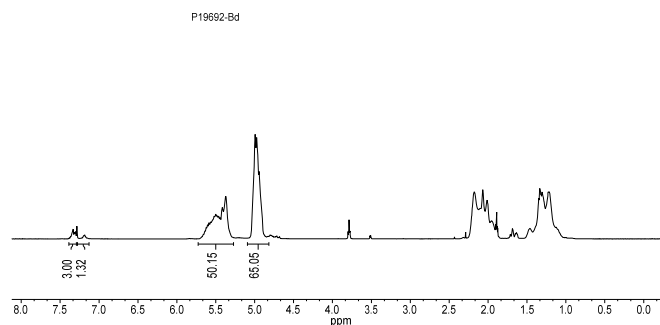
Cis 1,4 addition



Trans 1,4 addition



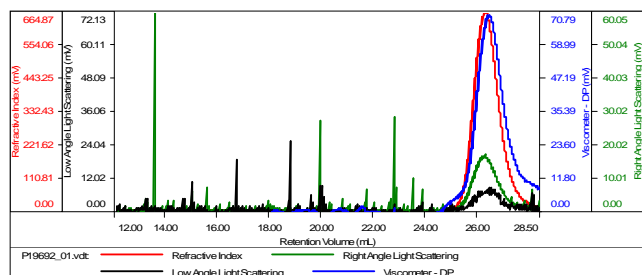
¹H NMR (500 MHz, CDCl₃) of polybutadiene:



SEC elugram:

Sample ID-P19692-Bd

Concentration (mg/mL)	5.8373
Sample dn/dc (mL/g)	0.1280
Method File	PS80K-June30-2015-0000.vom
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)
P19692_01.vot	2,452	2,568	2,349	1.047	0.6622

Reference: Thermal transition of PBd.

Polybutadiene (Mn=2.2–2.4 x10 ³)	Tg
1,2-addition: 78 %	–35°C
1,2-addition: 89 %	–29°C
1,2-addition: 99 %	–27°C