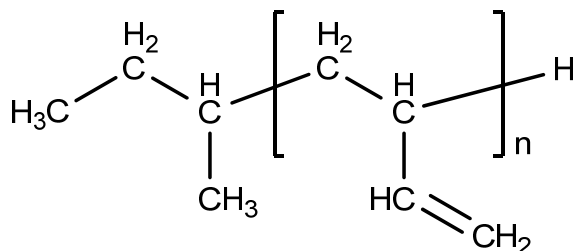


Sample Name: **Polybutadiene (1,2-addition)**

Sample #: **P19685-Bd**

Structure:



Composition:

Mn x 10 ³	PDI
2.8	1.08
PBd 1,4-addition	< 10 %
PBd 1,2-addition:	> 90 %

Synthesis procedure:

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

Characterization:

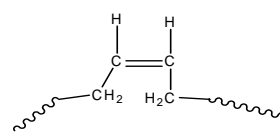
The ratio between 1,4- and 1,2-addition was calculated by ¹H NMR spectroscopy. Molecular weight and polydispersity index were determined by size exclusion chromatography (SEC).

Thermal analysis:

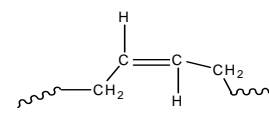
Thermal analysis of the copolymer was performed on a TA Q100 differential scanning calorimeter (DSC) at a heating rate of 10°C/min. The midpoint of the slope change of the heat flow plot of the second heating scan was considered as the glass transition temperature (T_g).

Solubility:

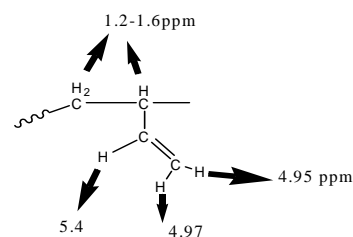
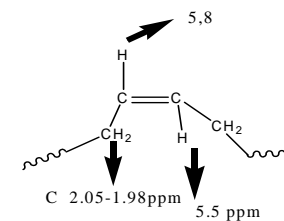
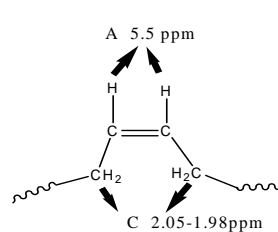
Polybutadiene is soluble in DMF, THF, toluene, hexane, cyclohexane and CHCl₃. It precipitates from methanol, ethanol and water.



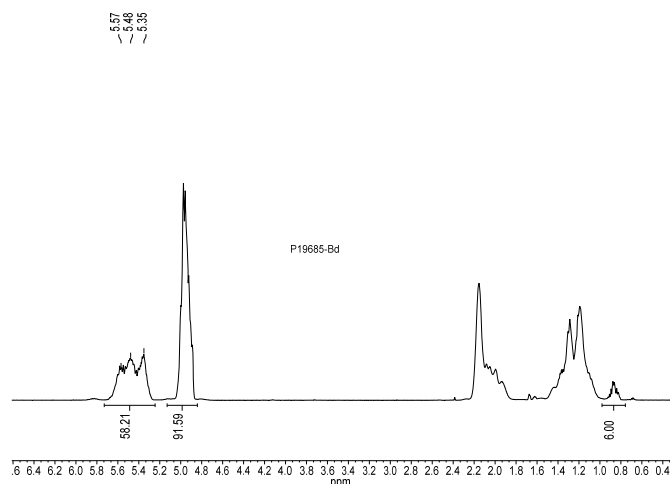
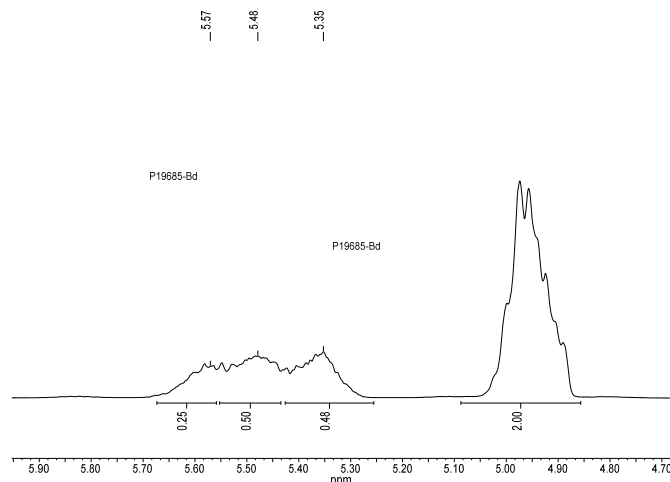
Cis 1,4 addition



Trans 1,4 addition

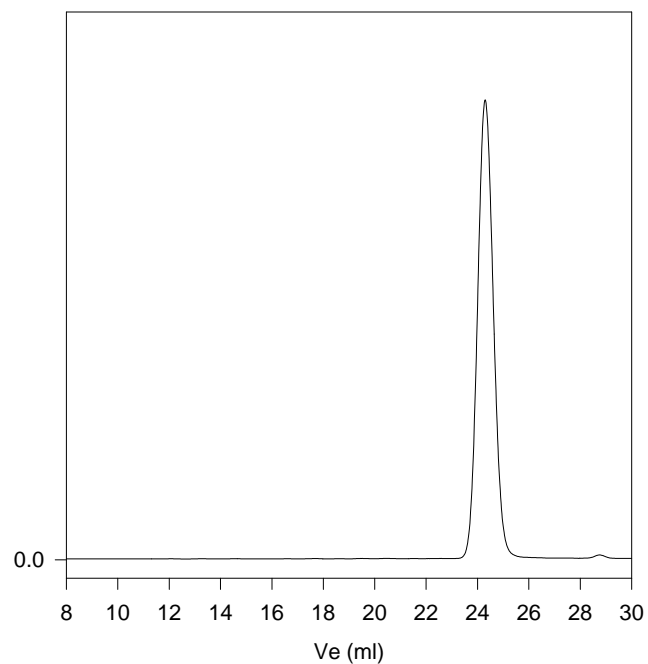


¹H NMR (500 MHz, CDCl₃) of polybutadiene:



SEC elugram:

P19685-Bd



Size exclusion chromatography of polybutadiene with respect to polybutadiene standards:

$M_n=2,800$, $M_w=3,000$, $M_w/M_n=1.08$

Reference: Thermal transition of PBd.

Polybutadiene ($M_n=2.2-2.4 \times 10^3$)	Tg
1,2-addition: 78 %	-35°C
1,2-addition: 89 %	-29°C
1,2-addition: 99 %	-27°C