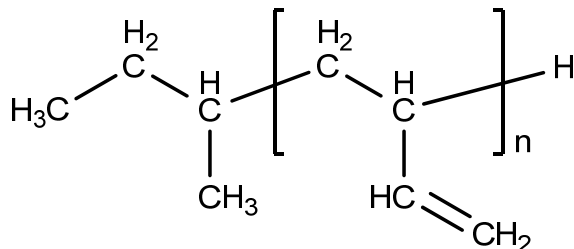


Sample Name: **Polybutadiene (1,2-addition)**

Sample #: **P19684-Bd**

Structure:



Composition:

$\text{Mn} \times 10^3$	PDI
2.2	1.01
PBd 1,4-addition	<11 %
PBd 1,2-addition:	>89 %
Glass transition temperature (T_g):	-29°C

Synthesis procedure:

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

Characterization:

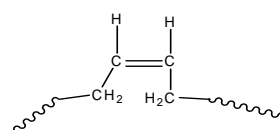
The ratio between 1,4- and 1,2-addition was calculated by ^1H NMR spectroscopy. Molecular weight and polydispersity index were determined by size exclusion chromatography (SEC).

Thermal analysis:

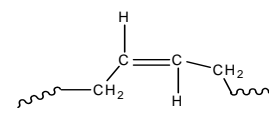
Thermal analysis of the copolymer was performed on a TA Q100 differential scanning calorimeter (DSC) at a heating rate of 10°C/min. The midpoint of the slope change of the heat flow plot of the second heating scan was considered as the glass transition temperature (T_g).

Solubility:

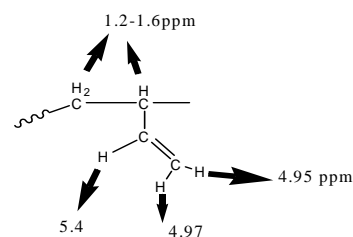
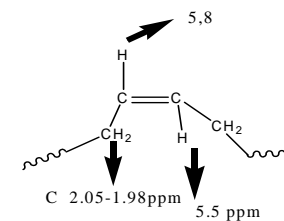
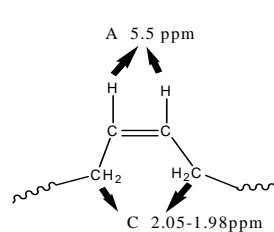
Polybutadiene is soluble in DMF, THF, toluene, hexane, cyclohexane and CHCl_3 . It precipitates from methanol, ethanol and water.



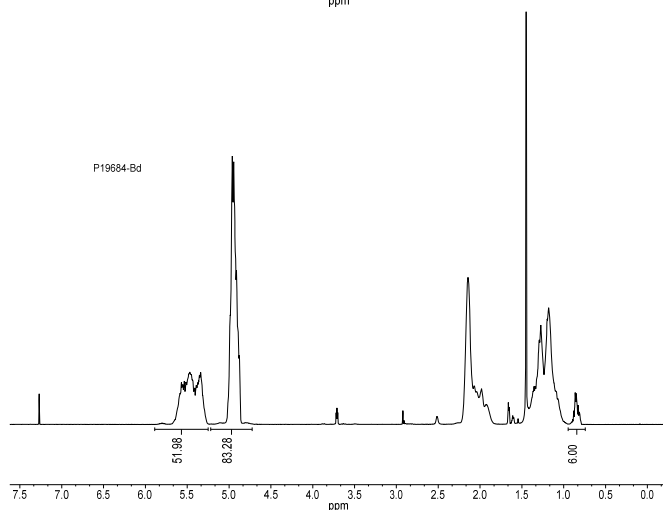
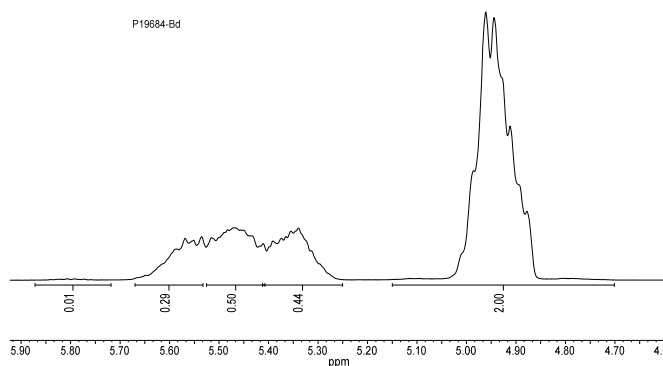
Cis 1,4 addition



Trans 1,4 addition



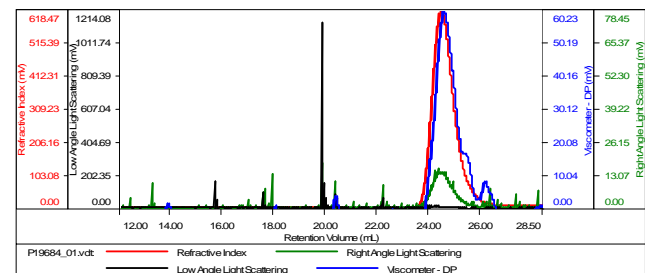
^1H NMR (500 MHz, CDCl_3) of polybutadiene:



SEC elugram:

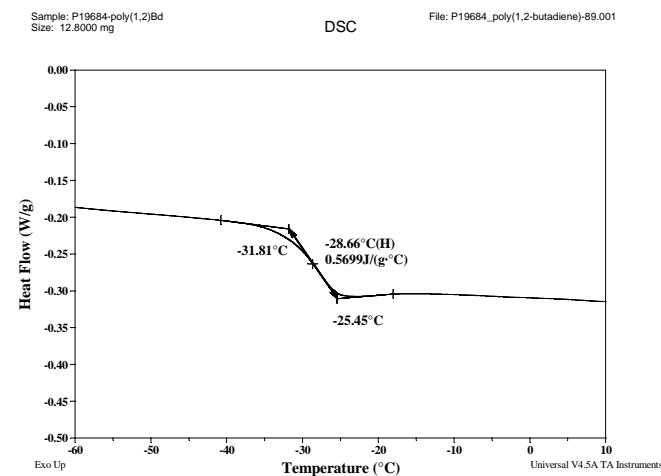
Sample ID-P19684-Bd

Concentration (mg/mL)	4.6325
Sample dn/dc (mL/g)	0.1250
Method File	PS80K-June00-2015-0000.vcm
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)
P19684_01.vcl	2,200	2,216	2,197	1.007	0.3688

DSC thermogram of P19684-Bd:



Reference: Thermal transition of PBd.

Polybutadiene (Mn=2.2–2.4 x 10 ³)	Tg
1,2-addition: 78 %	–35°C
1,2-addition: 89 %	–29°C
1,2-addition: 99 %	–27°C