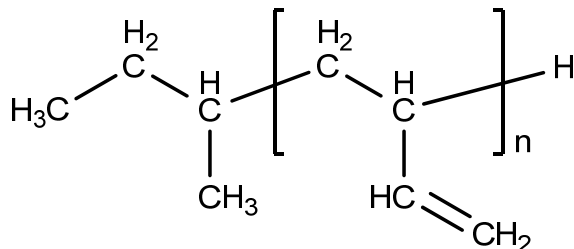


**Sample Name:** Polybutadiene (1,2-rich addition)

**Sample #:** P19296-Bd

**Structure:**



**Composition:**

Mn x 10 <sup>3</sup>	PDI
2.4	1.04
PBd 1,4-addition	22 %
PBd 1,2-addition:	78 %
Glass transition temperature (T <sub>g</sub> ):	-35°C

**Synthesis procedure:**

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

**Characterization:**

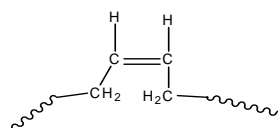
The ratio between 1,4- and 1,2-addition was calculated by <sup>1</sup>H NMR spectroscopy. Molecular weight and polydispersity index were determined by size exclusion chromatography (SEC).

**Thermal analysis:**

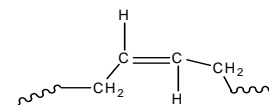
Thermal analysis of the copolymer was performed on a TA Q100 differential scanning calorimeter (DSC) at a heating rate of 10oC/min. The midpoint of the slope change of the heat flow plot of the second heating scan was considered as the glass transition temperature (T<sub>g</sub>).

**Solubility:**

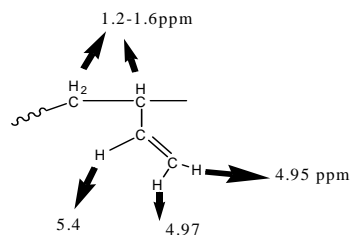
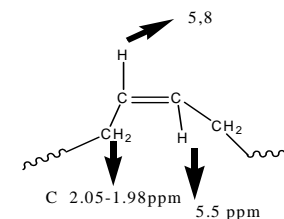
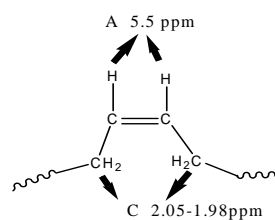
Polybutadiene is soluble in DMF, THF, toluene, hexane, cyclohexane and CHCl<sub>3</sub>. It precipitates from methanol, ethanol and water.



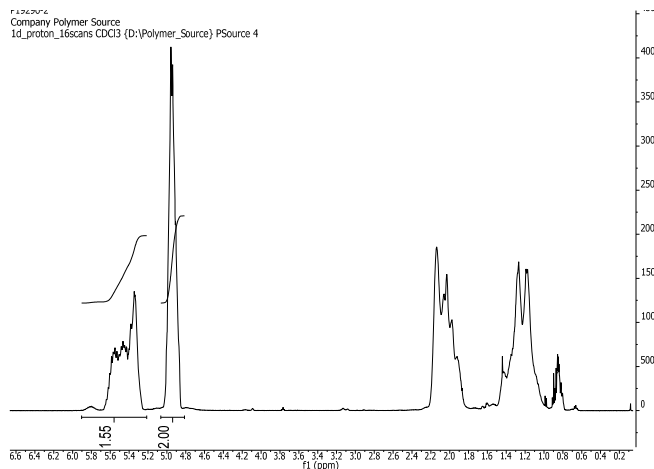
Cis 1,4 addition



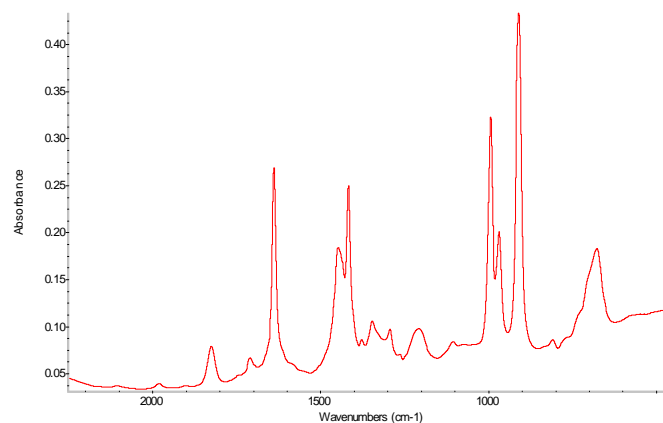
Trans 1,4 addition



**<sup>1</sup>H NMR (500 MHz, CDCl<sub>3</sub>) of polybutadiene:**



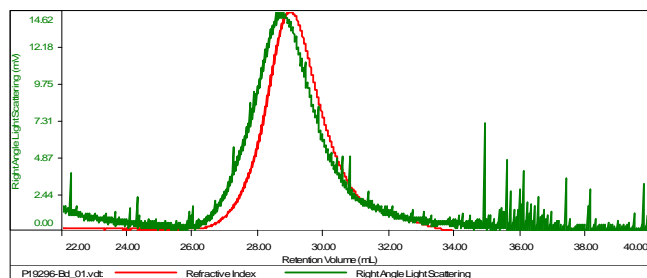
**FTIR spectrum:**



## SEC elugram:

Sample ID:P19296-1-BdOH

Concentration (mg/mL)	26.3337
Sample ch/dc (mL/g)	0.1270
Method File	PS80K-May20-2015-0000.vcm
Column Set	3x PL 1113-6300
Solvent	THF



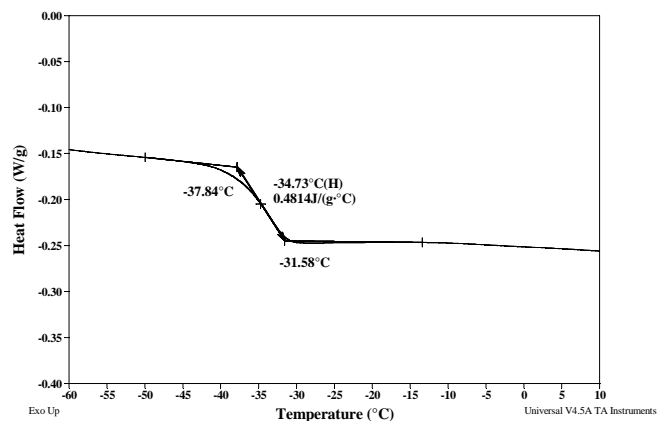
Sample	MW Number Average (Da)	MW Weight Average (Da)	MW at Peak (Da)	Polydispersi	Intrinsic Viscosity (dL/g)
P19296-Bd_01.vdt	2,422	2,501	2,420	1.032	0.1671

## DSC thermogram of P19296-Bd:

Sample: P19296\_poly(1,2)Bd  
Size: 13.7000 mg

DSC

File: P19296\_poly(1,2-butadiene)-78.001



Reference: Thermal transition of PBd.

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