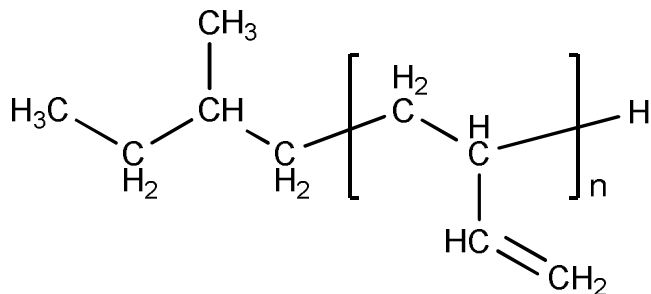


Sample Name: Polybutadiene (1,2-rich addition)

Sample #: P3626-Bd

Structure:

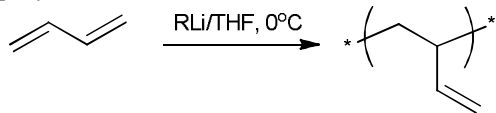


Composition:

Mn x 10 ³	PDI
3.0	1.05
PBd 1,2-addition:	> 85 %

Synthesis procedure:

1,2-addition polybutadiene was prepared by anionic living polymerization of butadiene:



Characterization:

The ratio between 1,4- and 1,2-addition was calculated from ¹H NMR spectrum by comparison of ratio between characteristic vinylic protons at 4.9 ppm (1,2-polybutadiene) and 5.3–5.5 ppm (1,4-polybutadiene). Molecular weight and polydispersity index were determined by size exclusion chromatography (SEC) in THF. SEC analysis was performed on a Varian liquid chromatograph equipped with refractive and UV light scattering detectors. Three SEC columns from Supelco (G6000-4000-2000 HXL) were used with triple detectors from Viscotek Co.

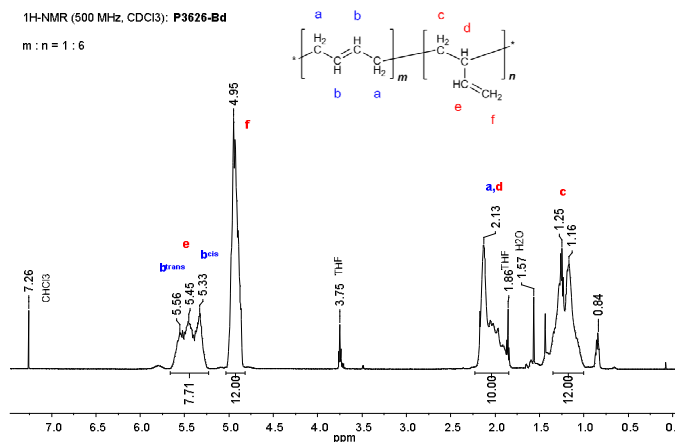
Thermal analysis:

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:

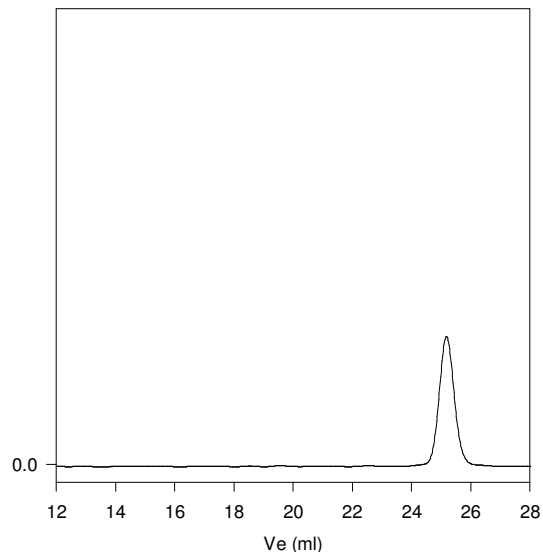
Polybutadiene is soluble in DMF, THF, toluene, hexane, cyclohexane and CHCl₃. It precipitates from methanol, ethanol and water.

¹H NMR polybutadiene in CDCl₃:



SEC elugram:

P3626-Bd(1,2 addition)



Size exclusion chromatography of polybutadiene with respect to polybutadiene standards:

M_n=3000, M_w=3150, M_w/M_n=1.05

Reference: Thermal transition of PBd.

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