

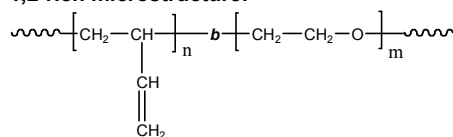
Sample Name: **Poly(butadiene-b-ethylene oxide)**

Polybutadiene rich in 1,2 or 1,4 microstructure

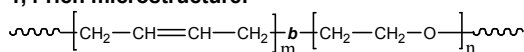
Sample #: **P19467B-BdEO**

(polybutadiene block rich in 1,4 microstructure)

1,2-rich microstructure:



1,4-rich microstructure:



Composition:

Mn x 10 ³ Bd-b-EO	Mw/Mn (PDI)
60.0-b-35.0	1.14
PBd microstructure	1,4 addition 60%

Synthesis Procedure:

Poly(butadiene(1,4 addition or 1,2 addition)-b-ethylene oxide) can be prepared by the different routes as reported in the literature (ref: Macromolecules 1996, 29, 6994). The direct synthesis of diblock copolymer using lithium counter ion in the presence of Phosphazene Base t-BuP4 is interesting as reported in *Macromolecules*, **32** (8), 2783 -2785, 1999. These polymers can also be successfully synthesized using the different end functionalized polymers as investigated in our lab. These methodologies are proprietary.

Characterization:

OH terminated polybutadiene was analyzed by size exclusion chromatography (SEC) to obtain the molecular weight and polydispersity index (PDI). The final block copolymer composition was calculated from ¹H-NMR spectroscopy by comparing the peak area of the vinylic butadiene protons at about 5.4 ppm with the ethylene oxide protons at 3.6 ppm. Block copolymer PDI is determined by SEC.

Solubility:

Poly(butadiene-b-ethylene oxide) is soluble in THF, CHCl₃, and toluene. The polymer has variable solubility in hexane, methanol, ethanol and water depending on its composition.

Figure: ¹H NMR spectrum of the sample

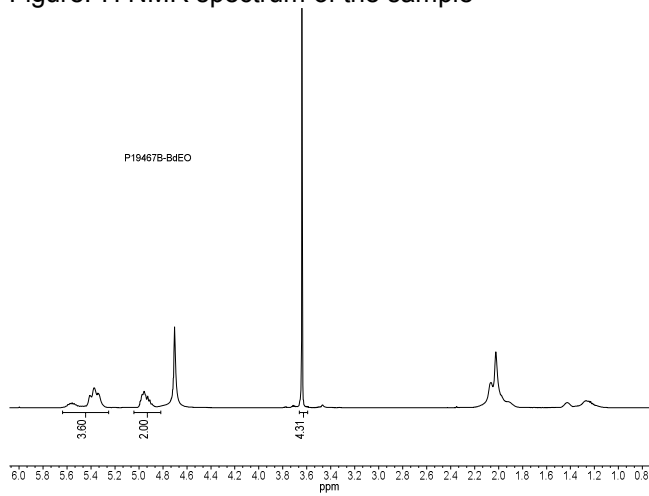
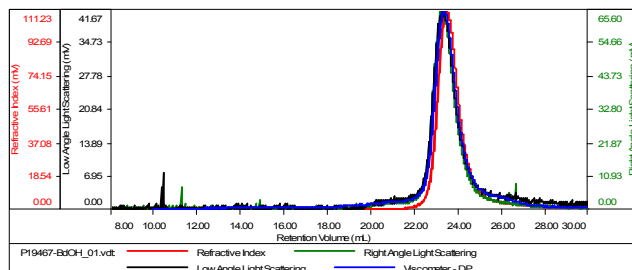


Figure: SEC profile of the block copolymer

Sample ID: **P19467-BdOH**

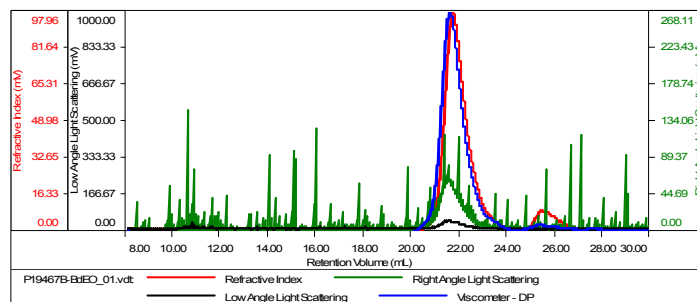
Concentration (mg/mL)	1.0325
Sample dn/dc (mL/g)	0.1250
Method File	PS80K-June30-2015-0000.vcm
Column Set	3x PL 1113-6300
Solvent	THF



Sample	MW Number Average (Da)	MW Weight Average (Da)	MW at Peak (Da)	Polydispersity	Intrinsic Viscosity (dL/g)
P19467-BdOH_01.vdt	60,466	65,094	59,505	1.077	4.7825

Sample ID: **P19467B-BdEO**

Concentration (mg/mL)	1.2029
Sample dn/dc (mL/g)	0.0620
Method File	PS80K-June30-2015-0000.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)
P19467B-BdEO_01.vdt	94,149	107,665	93,486	1.144	3.1744