

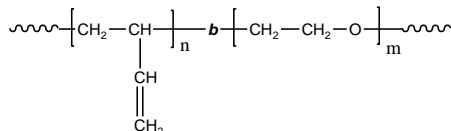
Sample Name: Poly(butadiene-b-ethylene oxide)

Poly butadiene rich in 1,2 or 1,4 microstructure

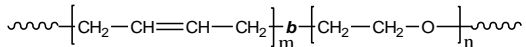
Sample #: P18324-BdEO

(poly butadiene block rich in 1,2 microstructure)

Structure of 1,2-rich microstructure about 95%:



Structure of 1,4-rich microstructure:



Composition:

Mn x 10 ³ Bd-b-EO	Mw/Mn (PDI)	% 1,2 addition Butadiene
13.5-b-4.5	1.04	95%
Dp: of each block: 40-b-34		

Synthesis Procedure: Initiator used :

Cumyl Potassium

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.

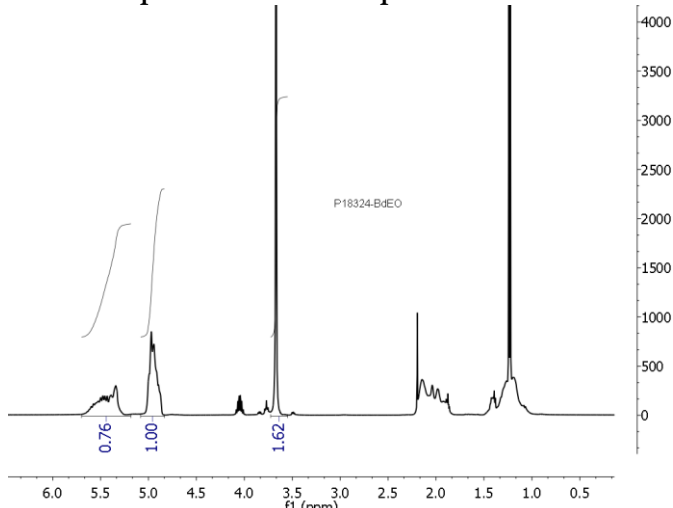
Characterization:

OH terminated polybutadiene polymer 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 between about 5.0-5.4 ppm with the ethylene oxide protons at 3.6 ppm. Block copolymer PDI is determined by SEC. Note: The ¹H-NMR of 1,2-polybutadiene is composed of 1 proton signal at 5.4 ppm and 2 proton signals at 5.0 ppm. Signals due to vinylic 1,4-polybutadiene are also present at 5.4 ppm.

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.

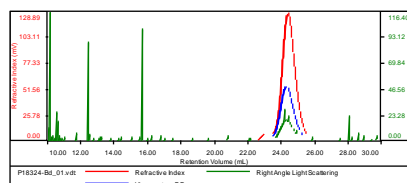
¹H NMR spectrum of the sample



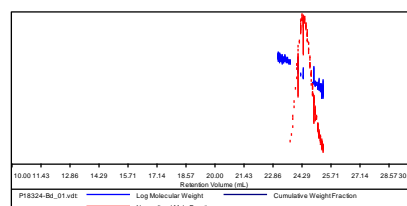
SEC profile of the block copolymer

Sample ID: P18324-Bd

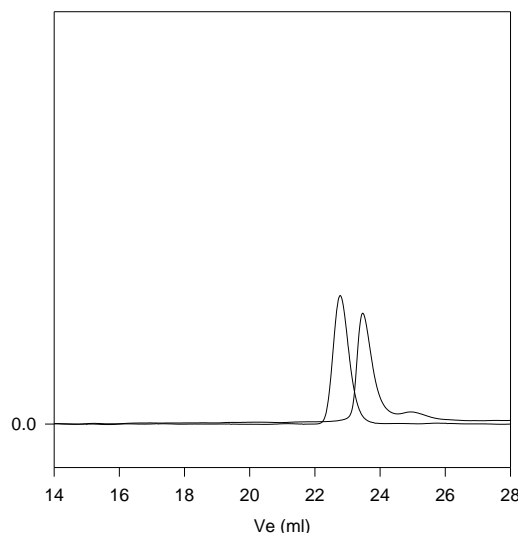
Concentration (mg/mL)	4.5132
Sample dn/dc (mL/g)	0.1270
Method File	PS80K-NOV25-2015-0000.vcm
Column Set	3x PL 1115-6300
System	System 1



Sample	Mn	Mw	Mp	Mw/Mn	IV
P18324-Bd_01.vcl	13,412	14,166	13,174	1.056	0.3815



P18324-BdEO



Size exclusion chromatography of poly(butadiene-b-ethylene oxide):

— 1,2 polybutadiene M_n=13,500, M_w=14,000, PI=1.03

— Block Copolymer PBd(13,500)-b-PEO(4,500), PI=1.04 (From nmr)