

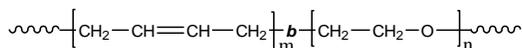
### Sample Name: Poly(butadiene-b-ethylene oxide)

Polybutadiene rich in 1,2 or 1,4 microstructure

#### P11463C-BdEO

(polybutadiene block rich in 1,4 microstructure)

#### 1,4-rich microstructure:



#### Composition:

Mn x 10 <sup>3</sup> Bd-b-EO	Mw/Mn (PDI)
1.0-b-2.6	1.25

#### 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 <sup>1</sup>H-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, CHCl<sub>3</sub>, and toluene. The polymer has variable solubility in hexane, methanol, ethanol and water depending on its composition.

#### H NMR of Bd-OH:

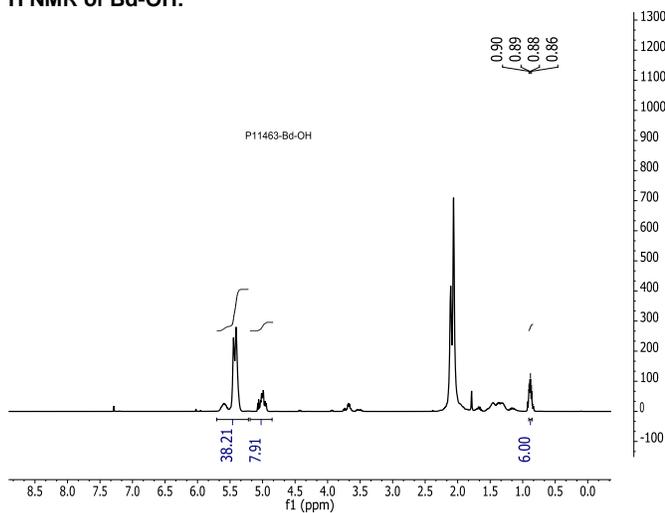


Figure: <sup>1</sup>H NMR spectrum of the sample

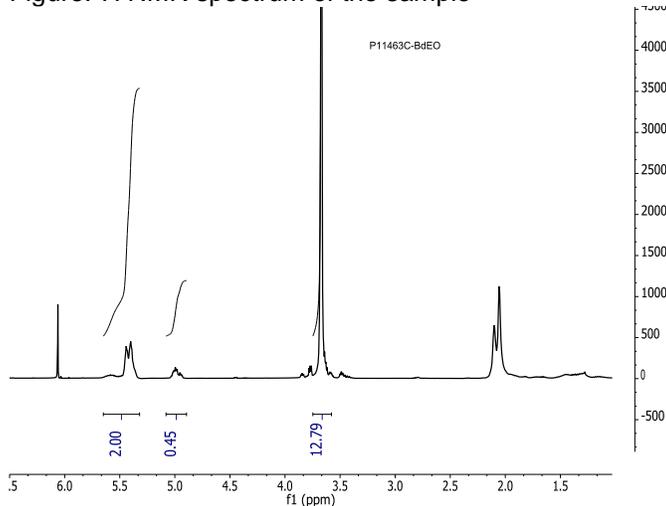
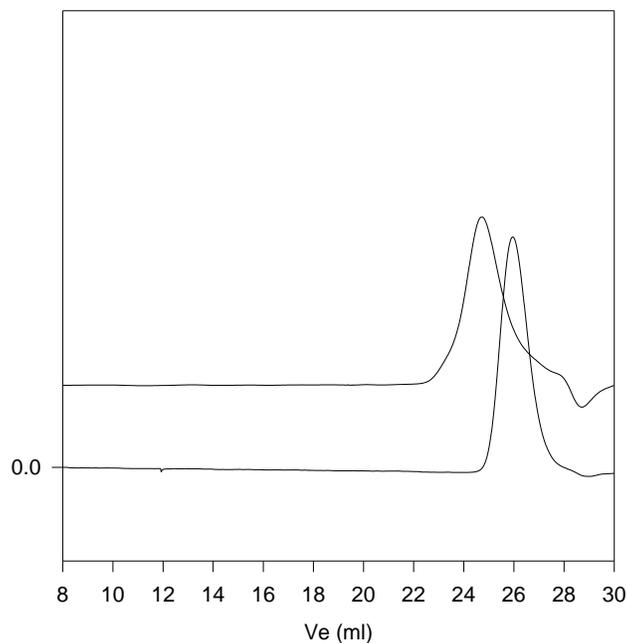


Figure: SEC profile of the block copolymer

#### P11463C-Bd<sub>1,4 rich</sub>EO



Size Exclusion Chromatogram of Poly(butadiene-b-ethylene oxide)

— Polybutadiene: M<sub>n</sub>=1,000, M<sub>w</sub>=1,100, M<sub>w</sub>/M<sub>n</sub>=1.09

— PBd-b-PEO: M<sub>n</sub> PBd(1,000)-PEO(2600), M<sub>w</sub>/M<sub>n</sub>=1.25

The M<sub>n</sub> of PEO is calculated from NMR results,