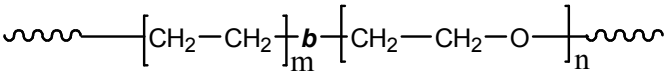
Sample Name: **Poly(Ethylene-b-ethylene oxide)**

Polybutadiene rich in 1,2 or 1,4 microstructure

P11463E-EEO

(Hydrogenation of polybutadiene block rich in 1,4 microstructure)

1,4-rich microstructure:



Composition:

Mn x 10^3 E-b-EO	Mw/Mn (PDI)
1.0-b-1.8	1.04

Synthesis Procedure:

Poly(butadiene(1,4 addtion 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*-**BuP_4 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.

Product was hydrogenated in the presence of Wilkinson catalyst under 400psi of hydrogen. Polymer was dissolved and filter through a column of silica at 40 oC.

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 ^{1}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, $CHCl_3$, and toluene. The polymer has variable solubility in hexane, methanol, ethanol and water depending on its composition.

Bd-OH

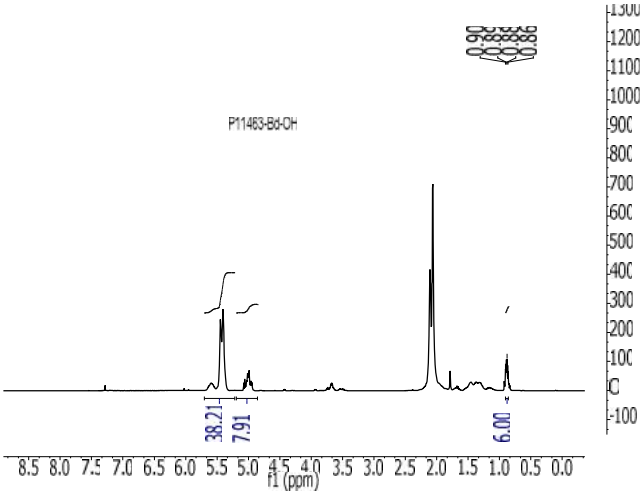


Figure: ^{1}H NMR spectrum of the sample

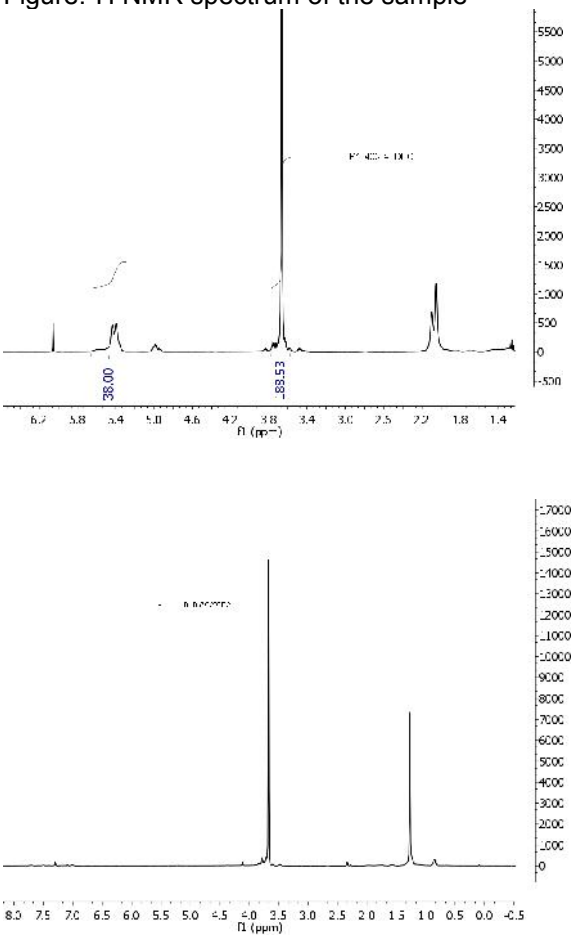
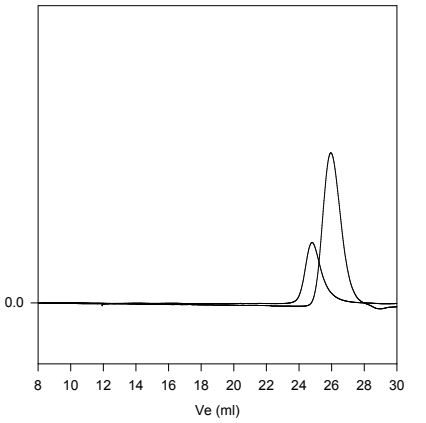


Figure: SEC profile of the block copolymer

P11463E-Bd$_{1,4\ rich}$EO



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

—— Polybutadiene: M_n=1,000, M_w=1,100, M_w/M_n=1.09

—— PBd-b-PEO: M_n PBd(1,000)-PEO(1800), M_w/M_n=1.04
The Mn of PEO is calculated from NMR results,

After hydrogenation : Mn 1000-b-1800 Mw/Mn 1.04