

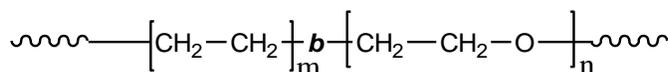
Sample Name: Poly(Ethylene-b-ethylene oxide)

Polybutadiene rich in 1,2 or 1,4 microstructure

Sample#: P8678A-EEO

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

Structure:



Composition:

Mn x 10 ³ E-b-EO	Mw/Mn (PDI)
2.0-b-2.5	1.08

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.

Product was hydrogenated in the presence of Wilkinson catalyst under 400psi of hydrogen.

After filtration couple of time by dissolving in Benzene at 65°C, the product was still bears the coloration. This color from the polymer cannot be removed. The product in hot toluene, benzene is clear with light coloration.

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 (precursor before Hydrogenation)

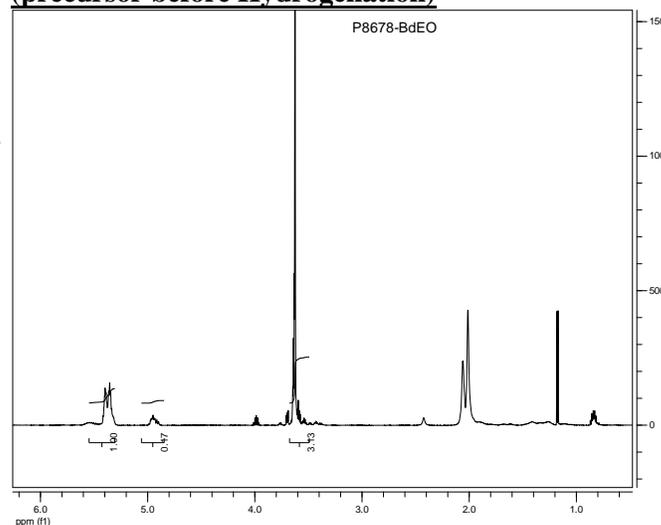
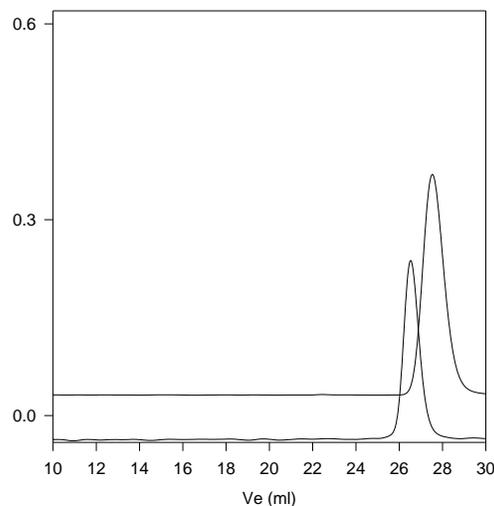


Figure: SEC profile of the block copolymer before Hydrogenation

P8678-Bd_{1,4} rich EO



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

— Polybutadiene: M_n=2000, M_w=2200, M_w/M_n=1.10

— PBd-b-PEO: M_n PBd(2000)-PEO(2500), M_w/M_n=1.08

The Mn of PEO is calculated from NMR results,