

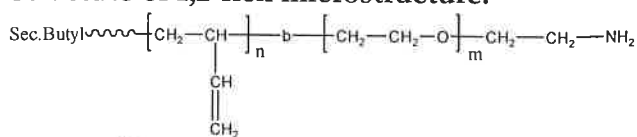
**Sample Name: Amino end functionalized Poly(butadiene-b-ethylene oxide)**

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

**Sample #: P10172C-BdEONH2**

*(poly butadiene block rich in 1,2 microstructure)*

**Structure of 1,2-rich microstructure:**



**Composition:**

Mn x 10 <sup>3</sup> Bd-b-EONH2	Mw/Mn (PDI)	% 1,2 addition Butadiene
1.2-b-1.0	1.09	95

**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-BuP<sub>4</sub>** 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:**

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 <sup>1</sup>H-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 <sup>1</sup>H-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.

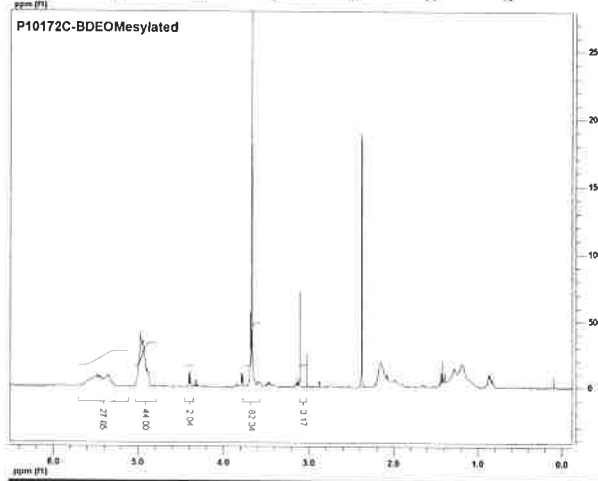
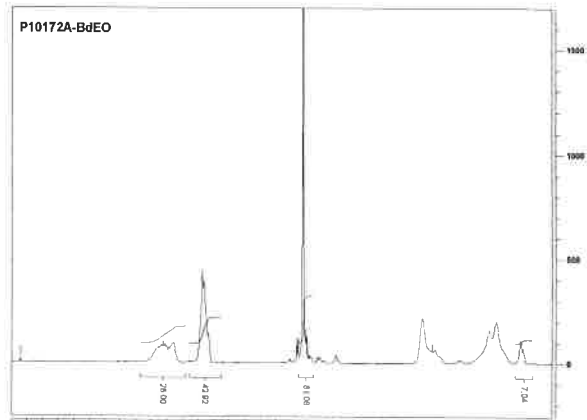
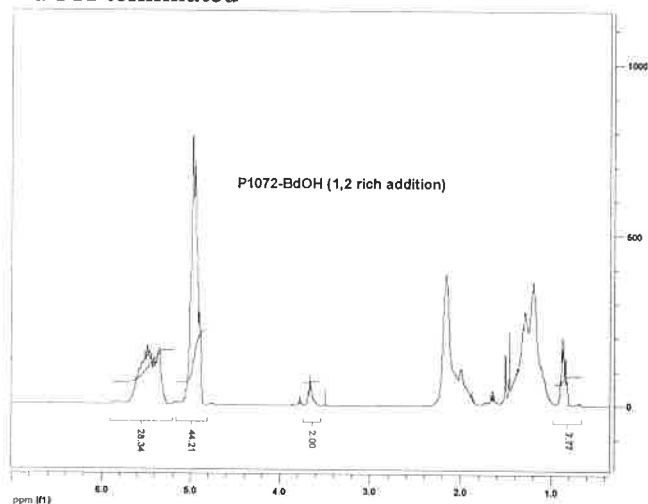
**Solubility:**

Amino end functionalized 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.

**Titration:** the degree of functionality was confirmed by titration with HClO<sub>4</sub> using crystal violet as the indicator.

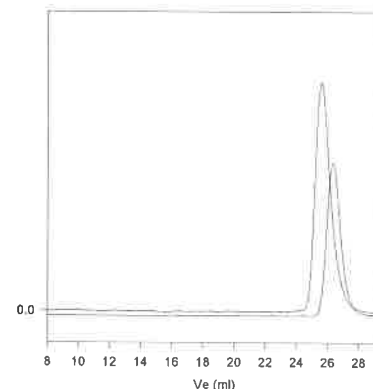
**<sup>1</sup>H NMR spectrum of the sample at different steps:**

**BdOH terminated**



**SEC profile of the block copolymer**

P10172C-BdEO



Size exclusion chromatography of poly(butadiene-b-ethylene oxide):  
 — OH terminated 1,2 polybutadiene  $M_n=1200$ ,  $M_w=1300$ ,  $PI=1.09$   
 — Block Copolymer PBd(1200)-b-PEO(1000),  $PI=1.09$   
 (Chemical composition From <sup>1</sup>NMR)

