

Figure:  $^{13}\text{C}$  NMR spectrum of the sample

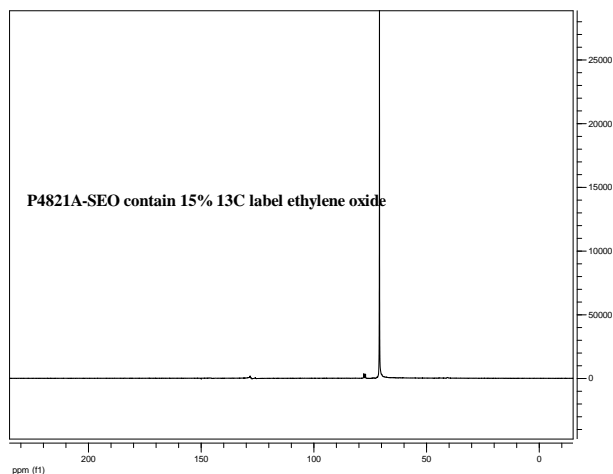
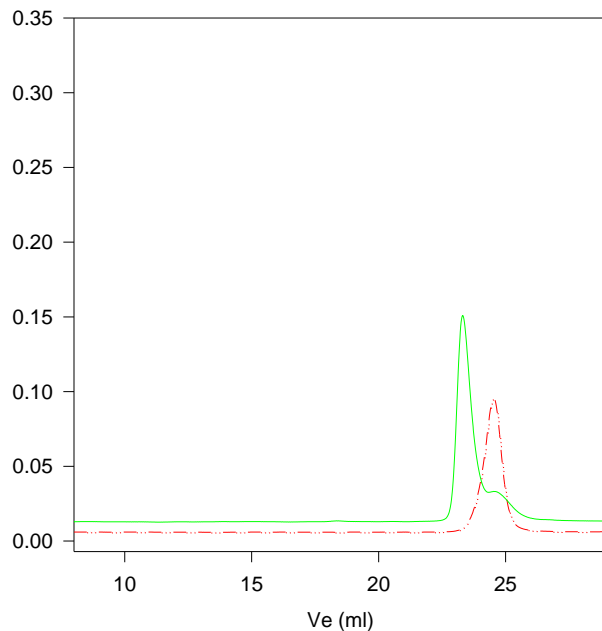


Figure: SEC profile of the block copolymer  
**P4821A-SEO**



Size exclusion chromatography of  
poly(styrene-b-ethylene oxide contain C13 label ethylene oxide:15%)

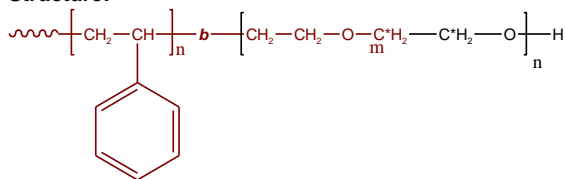
- Poly(styrene),  $M_n=40000$ ,  $M_w=42000$ ,  $PI=1.06$
- Block Copolymer PSt(40000)-b-PEO(40000),  $PI=1.10$

Composition from  $^1\text{H}$  NMR

**Sample Name:** Poly(styrene-b-ethylene oxide)  
**Contain 15%  $^{13}\text{C}$  label ethylene oxide**

**Sample #:** P4821A-SEOC\*

**Structure:**

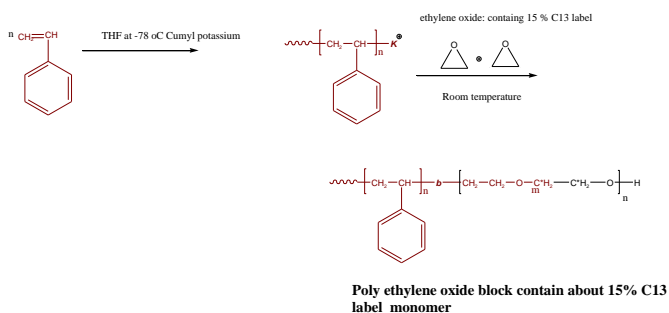


**Composition:**

$M_n \times 10^3$ S-b-EO	PDI
40-b-40.0	1.10

#### Synthesis Procedure:

Poly(styrene-b-ethylene oxide) diblock copolymer is prepared by living anionic polymerization. Following is the scheme of the reaction illustrated. The ethylene oxide monomers contain about 15%  $^{13}\text{C}$  label monomer. The obtained polymer chains bear a terminal OH group.



#### Characterization:

The molecular weight and polydispersity index (PDI) of the block copolymer are characterized by size exclusion chromatography (SEC). The composition of the block copolymer was calculated from  $^1\text{H}$ -NMR by comparing the peak area of the phenyl polystyrene protons between 6.4 to 7.2 ppm and the ethylene oxide protons at 3.65 ppm.

**Solubility:** The polymer is soluble in THF (at 35 °C),  $\text{CHCl}_3$ , benzene, toluene, dioxane. Low molecular weight SEO with high contents of the polyethylene oxide block can also be solubilized in methanol and water.