

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

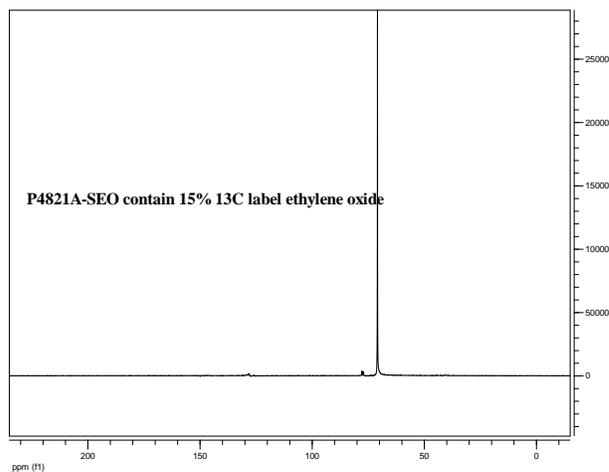
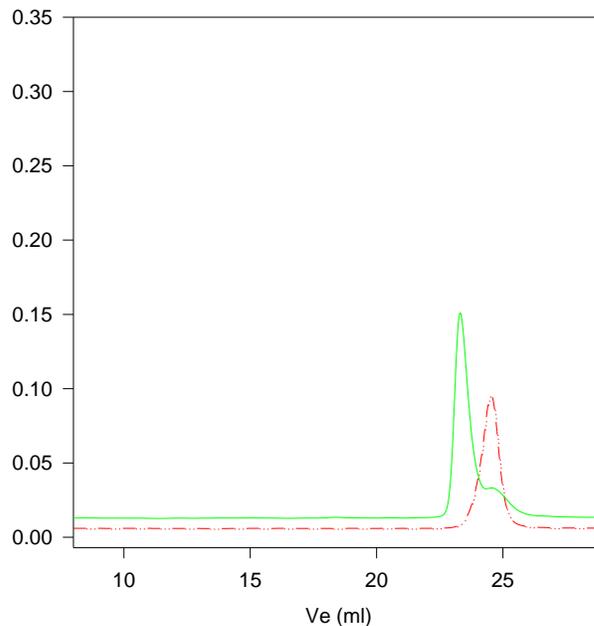


Figure: SEC profile of the block copolymer
P4821A-SEO



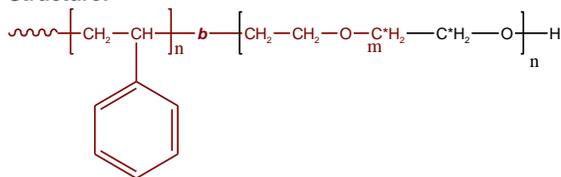
Size exclusion chromatography of poly(styrene-b-ethylene oxide contain C13 label ethylene oxide:15%)

- Poly(styrene), $M_n=40000$, $M_w=42000$, $PI=1.06$
 - Block Copolymer $\text{PSt}(40000)\text{-b-PEO}(40000)$, $PI=1.10$
- Composition from ^1H NMR

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

Sample #: P4821A-SEOC*

Structure:

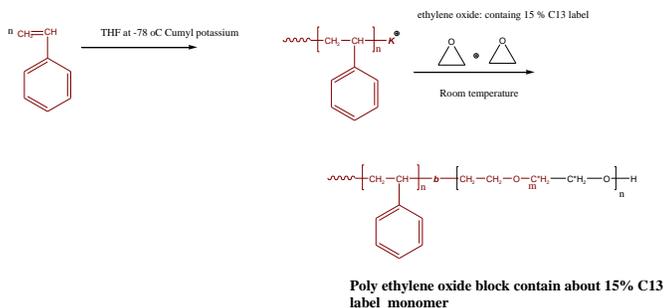


Composition:

$M_n \times 10^3$	PDI
S-b-EO	
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}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 ^1H -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), 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.