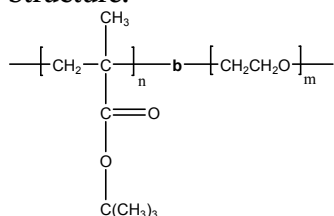


Sample Name: Poly(t-butyl methacrylate -b- ethylene oxide)

Sample #: P4520-tBuMAEO

Structure:

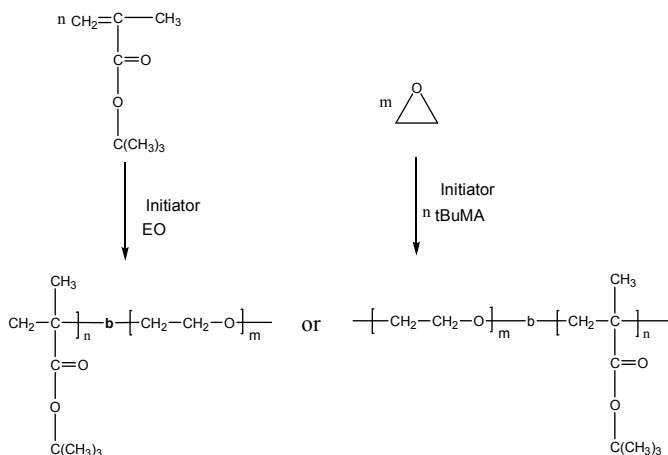


Composition:

Mn x 10 ³ PtBuMA-b-PEO	PDI
5.5-16.5	1.08

Synthesis Procedure:

Poly(tert.butylmethacrylate-b-ethylene oxide) is prepared by 2 different routes: i) By living anionic polymerization of sequential addition of EO and tBuMA (ethylene oxide or t-butyl methacrylate) or ii) by chemical coupling reaction of the corresponding functionalized polymers. The scheme of the reaction is illustrated below:



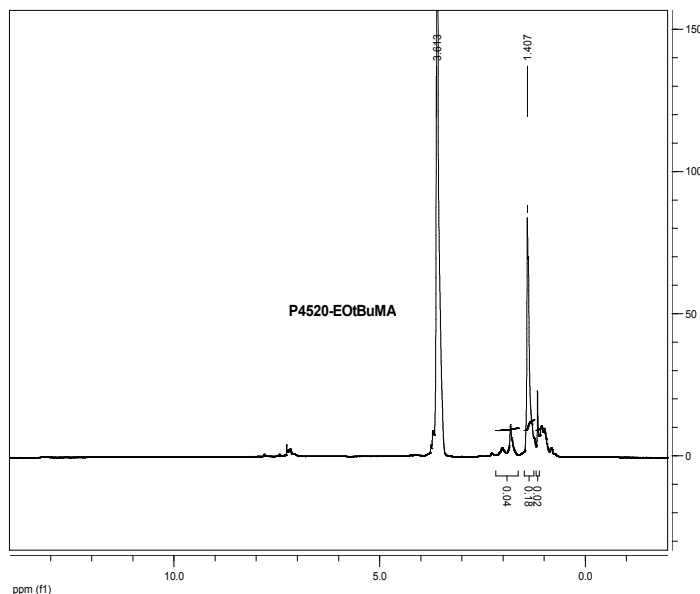
Characterization:

An aliquot of the first anionic block was terminated before addition of monomer required to make the second block and 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 t-butyl methacrylate protons at 1.43 ppm with the peak area of the ethylene oxide protons at 3.6 ppm. Copolymer PDI is determined by SEC.

Solubility:

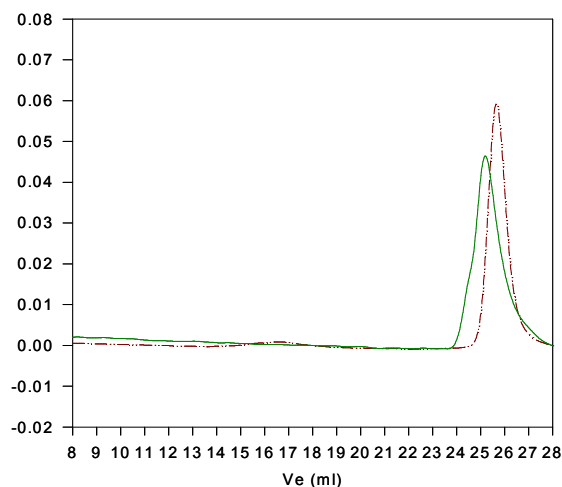
Poly(t-butylmethacrylate -b- ethylene oxide) is soluble in CHCl₃, methanol, THF and precipitated out from cold hexane or ether. It swells in water depending on the compositions.

¹H-NMR Spectrum of the block copolymer:



SEC of the block copolymer:

P4520-tBuMAEO



Size exclusion chromatography of poly(t.butyl methacrylate-b-ethylene oxide)

--- Poly(tert.butyl methacrylate)
M_n=5500, M_w=5800, PDI=1.05

— Block copolymer PtBuMA-b-EO Mn: (5500-b-13500) Mw/Mn: 1.08
from Composition also from ¹H NMR

References:

J. Wang, S. K. Varshney, J. Jerome and Ph. Teyssie
"Synthesis of AB (BA) ABA and BAB Block copolymers of tert-butylmethacrylate (A) and ethylene oxide (B) " *CA Vol 117, 16, 151478, J. Polym. Sci., Part-A: Polym. Chem. Ed., 1992, 30, 2251-2261.*