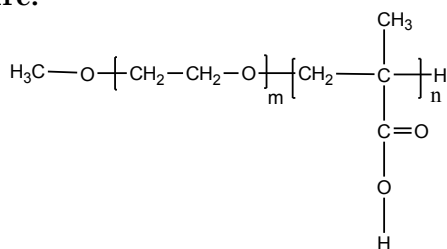


Sample Name: Poly(ethylene oxide -b- methacrylic acid)

Sample #: P18207A-EOMAA

Structure:



Composition:

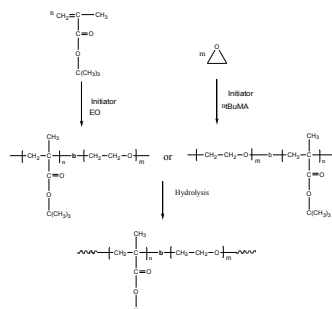
Mn × 10 ³ PEO-b-PMAA	PDI
6.7-b-1.3	1.5

Synthesis Procedure:

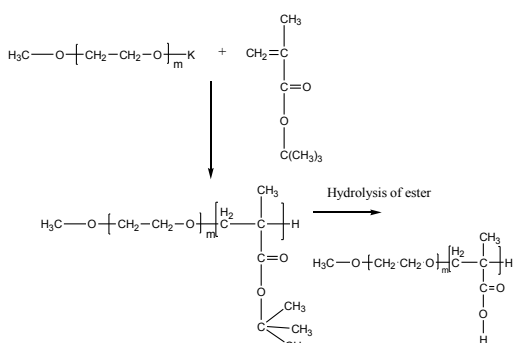
Poly(ethylene oxide -b- methylacrylic acid) is prepared by 2 different routes:

A. By living anionic polymerization of sequential addition of EO and tBuMA (ethylene oxide or t-butyl methacrylate) followed by hydrolysis of the t-butyl group or

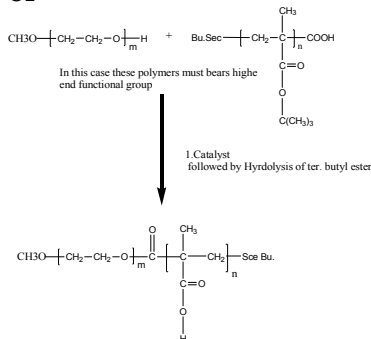
B. by chemical coupling reaction of the corresponding functionalized polymer. The scheme of the reaction is illustrated below:



or



or



Characterization:

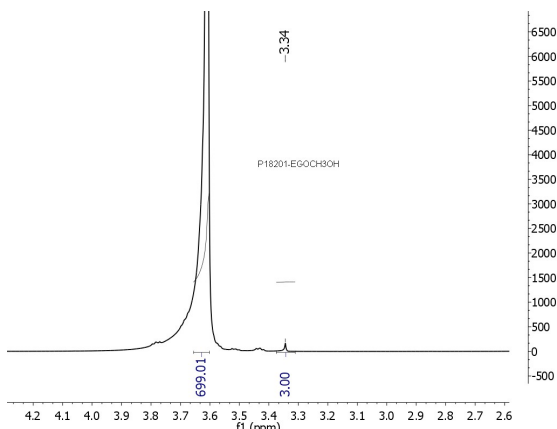
Polymer analyzed by size exclusion chromatography (SEC) to obtain the molecular weight and polydispersity index (PDI). The final block copolymer composition was calculated from ¹H-NMR spectroscopy.

Hydrolysis: To cleave the tert.butyl ester moiety the hydrolysis was carried out in dioxane using acid catalyst. The degree of hydrolysis was checked by FTIR the disappearance of characteristics at 1362cm⁻¹

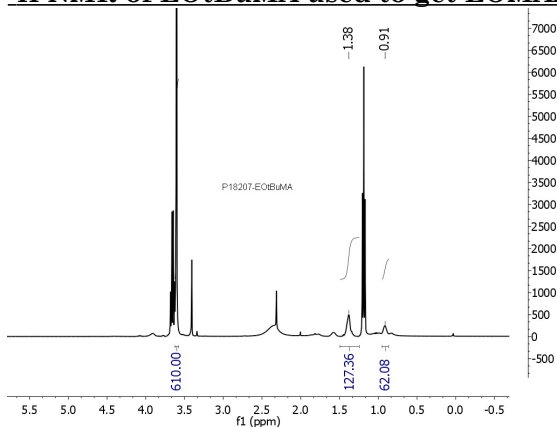
Solubility:

Poly(ethylene oxide -b- methacrylic acid) is soluble in THF, methanol, ethanol and precipitate out in hexane, ether and water (depending on compositions).

¹H NMR of PEG

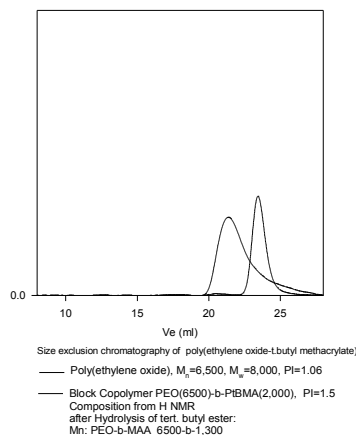


¹H NMR of EOtBuMA used to get EOMAA



SEC of the block copolymer:

P18207-EOtBuMA



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.*