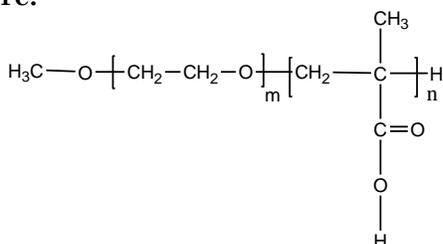


Sample Name: Poly(ethylene oxide -b- methacrylic acid)

Sample #: P18207B-EOMAA

Structure:



Composition:

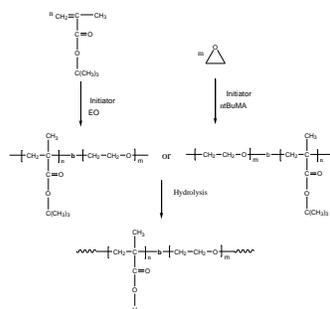
| Mn × 10 ³ PEO-b-PMAA | PDI |
|------------------------------------|-----|
| 6.7-b-2.2 | 1.4 |

Synthesis Procedure:

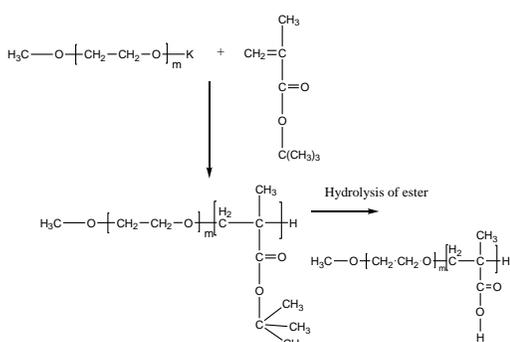
Poly(ethylene oxide -b- methylacrylic acid) is prepared by 2 different routes:

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

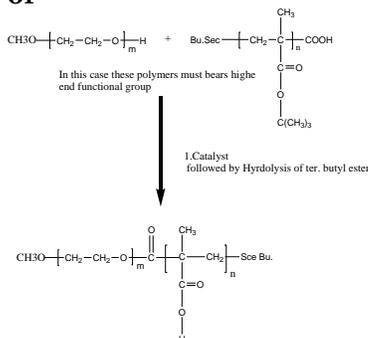
B. by chemical coupling reaction of the corresponding functionalized polymer. The scheme of the reaction is illustrated below:



or



or



Characterization:

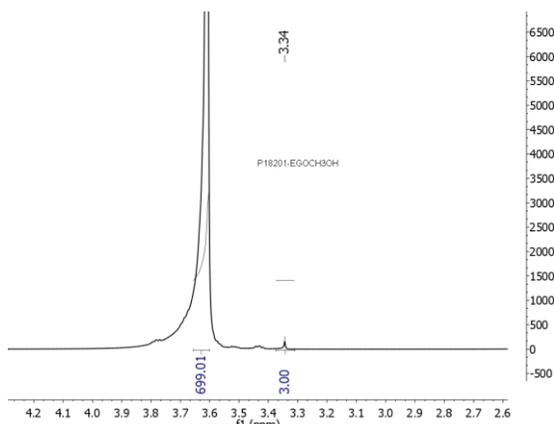
Polymer analyzed by size exclusion chromatography (SEC) to obtain the molecular weight and polydispersity index (PDI). The final block copolymer composition was calculated from ¹H-NMR spectroscopy.

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

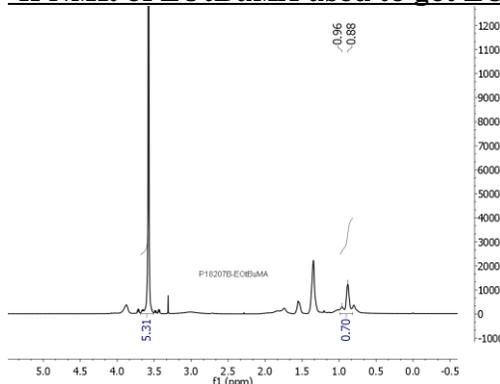
Solubility:

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

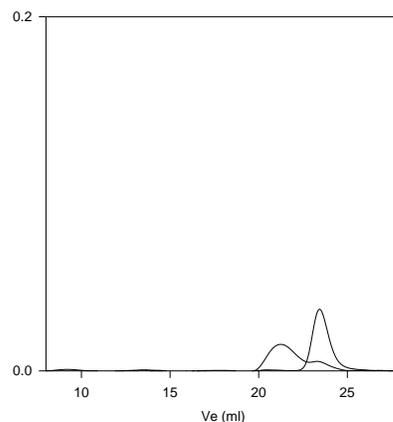


¹H NMR of EOtBuMA used to get EOMAA



SEC of the block copolymer:

P18207B-EOtBuMA



Size exclusion chromatography of poly(ethylene oxide-t-butyl methacrylate)
 — Poly(ethylene oxide), M_n=6,500, M_w=8,000, PI=1.06
 — Block Copolymer PEO(6500)-b-PtBMA(3,800), PI=1.4
 After Hydrolysis of tert.butyl ester: PEI-b-MAA: 6,700-b-2,200
 Composition from H 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.*