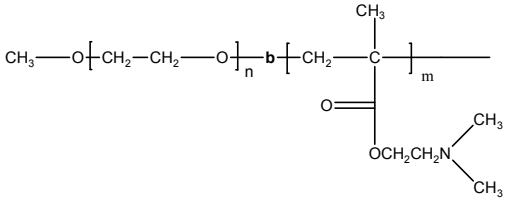
Sample Name:
Poly(ethylene oxide -b- 2-(dimethylamino) ethyl methacrylate)

Sample #: **P5163- EODMAEMA**

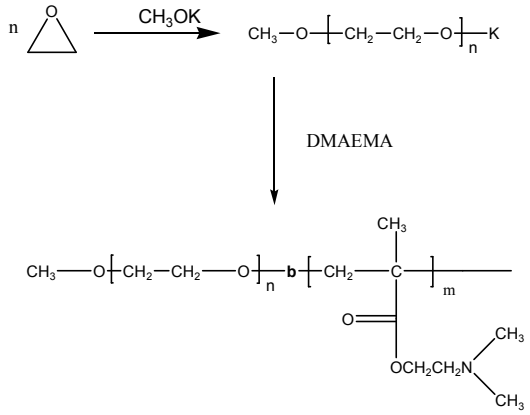
Structure:



Composition:

Mn x 10^3 PEO-b-PDMEMA	PDI
4.2-b-8.0	Broad

Synthesis Procedure:
Poly(ethylene oxide –b- 2-(dimethylamino)ethyl methacrylate) is prepared by living anionic polymerization of sequential addition of ethylene oxide and 2-(dimethylamino)ethyl methacrylate. The scheme of the reaction is illustrated below:

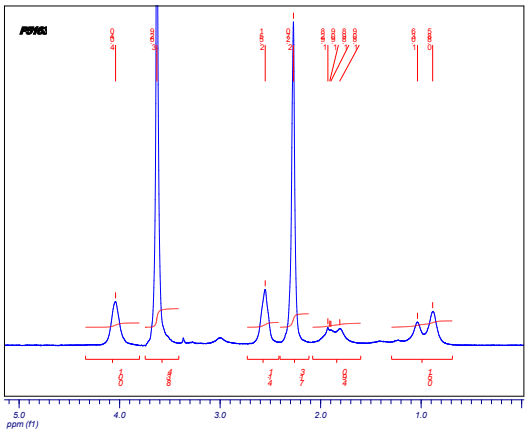


Characterization:
An aliquot of the first anionic block was analyzed by size exclusion chromatography (SEC) to obtain the molecular weight and polydispersity index (PDI) before addition of the second block. The final block copolymer composition and molecular weight are calculated from ^{1}H-NMR spectroscopy by comparing the peak area of the ethylene oxide protons at about 3.6 ppm with the 2-(dimethylamino)ethyl methacrylate protons at about 0.8-5 ppm that deducts the contribution of poly(ethylene oxide). For the diblock polymer with a shorter block of PDMEMA can be eluted from THF as eluent. However with longer block of PDMEMA block can not be eluted from THF as eluent. This may be due to strong interaction between the polymer and the column packing material.

Purification of the polymer and removal of any un-reacted homopolyethylene oxide from the diblock copolymer: Polymer dissolved in water and the pH of the medium increased to about 13 by adding NaOH. Now the solution warmed to 80 oC and the polymer precipitated out. This procedure was repeated 2 time to removed any homo PEO. Now the polymer dissolved in methanol and pH was adjusted to about 8 by adding HCL The polymer solution was filtered and the solvent was removed by rota-evaporator. The highly viscous solution was precipitated in cold hexane/ether mixture. The polymer was dried under vacuum at 40 oC.

Solubility:
The polymer is soluble in water and precipitate out from hexane, ether.

^{1}H-NMR Spectrum of the block copolymer:



SEC of the Polymer: