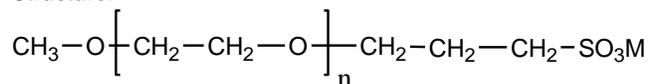


## Sample Name:

### $\alpha$ -Methoxy- $\omega$ -Sulfonic acid terminated Poly(ethylene glycol)

Sample #: P5819- EGOCH3SO3H

#### Structure:



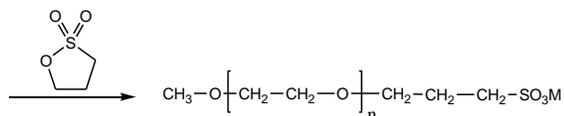
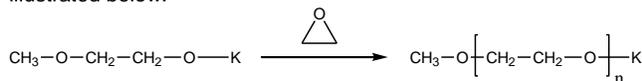
M = H, Na, Li, K

#### Composition:

Mn x 10 <sup>3</sup>	PDI
2.0	1.10

#### Synthesis Procedure:

Sulfonic acid functionalized poly(ethylene oxide) is prepared by living anionic polymerization of ethylene oxide followed by termination with dried propansultone. The salt can be prepared by neutralization with the base solution. The scheme of the reaction is illustrated below:



M = H, Na, Li, K

#### Characterization:

The molecular weight and polydispersity index of this polymer were determined by size exclusion chromatography (SEC) using a Varian liquid chromatograph equipped with a UV and refractive index detector.

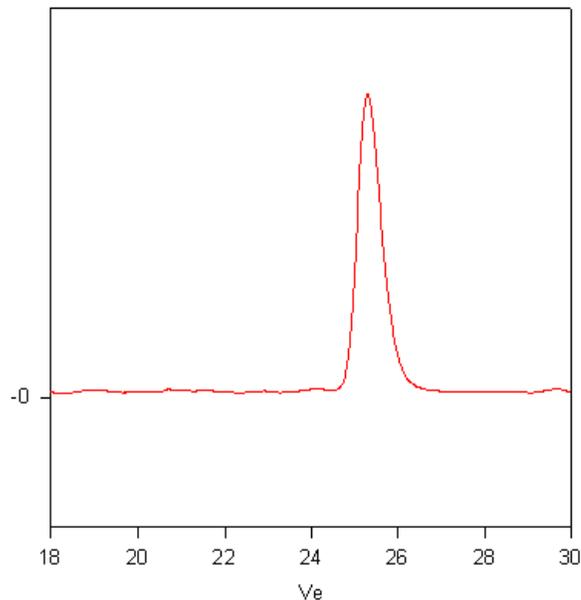
The sulfonic acid functionality of the polymer was determined by two-phase titration with Hyamine<sup>®</sup> 1622 (Fluka) in water-chloroform using the methylene blue (Fluka) as indicator (Ref: Quirk & Kim, *Macromolecules*, 1991, **24**, 4515-4522). The functionality of the polymer from titration was indicated on the label.

FTIR of the product clearly illustrate also the presence of SO<sub>3</sub>H at 1194 Cm<sup>-1</sup>.

#### Purification of the polymer:

Product can be hydrolyzed by acidic water and can liberate sulfonic acid. Product was purified by washing with ether and petroleum ether to remove excess of propane sultone. Finally the polymer was dissolved in acetone and pass through the mixed bed exchange resin IONAC NM -60 H<sup>+</sup>/OH<sup>-</sup> form. The product than concentrated and precipitated in cold diethyl ether. Product is extremely hydrophilic and can absorb moisture from the atmosphere.

## SEC of Sample:



Size Exclusion Chromatography profile of  $\alpha$ -methoxy- $\omega$ -sulfonic acid terminated poly(ethylene glycol):

M<sub>n</sub>=2000, M<sub>w</sub>=2200, Mw/Mn = 1.10

## FTIR of the Product:

