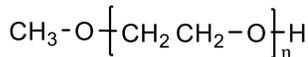


**Sample name:** Poly (ethylene glycol) methyl ether or Poly ethylene oxide

**Sample #** P18531- EGOCH3OH

**Structure:**

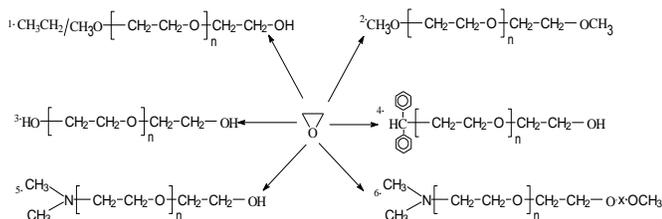


**Composition:**

Mn (g/mol)	PDI
600	1.05

**Synthesis Procedure:**

Poly(ethylene glycol) was obtained by living anionic polymerization. The scheme of the reaction is presented below:



Initiator System	Obtained Polymer
1) $\text{CH}_3\text{OCH}_2\text{CH}(\text{CH}_3)\text{OK}$	polyethylene glycol methyl ether
2) $\text{CH}_3\text{OCH}_2\text{CH}(\text{CH}_3)\text{OK}$	$\alpha$ , $\omega$ -term. methyl ether polyethylene glycol
3) $\text{KOCH}_2\text{CH}_2\text{OK}$	polyethylene glycol
4) $\text{CH}(\text{C}_6\text{H}_5)_2\text{CK}$	polyethylene glycol diphenyl ether
5) $(\text{CH}_3)_2\text{N-CH}_2\text{CH}_2\text{OK}$	methyl amino terminated PEG
6) $(\text{CH}_3)_2\text{N-CH}_2\text{CH}_2\text{OK}$	$\alpha$ -methyl amino $\omega$ -methyl ether term. PEG

**Purification of the PEG polymer:**

The obtained polymer was rigorously purified to ensure the removal of the catalyst and side products:

1. The polymer was dissolved in de-ionized distilled water to remove any insoluble organic catalyst and/or side products.
2. Polymer was extracted from water with dichloromethane.
3. Polymer solution in dichloromethane was dried over anhydrous sodium sulfate.
4. The solution was filtered and passed through a column packed with basic  $\text{Al}_2\text{O}_3$ .
5. The solution was concentrated on rota-evaporator, followed by precipitation into cold diethyl ether.
6. The product was dried under vacuum for 48 h at  $38^\circ\text{C}$ .

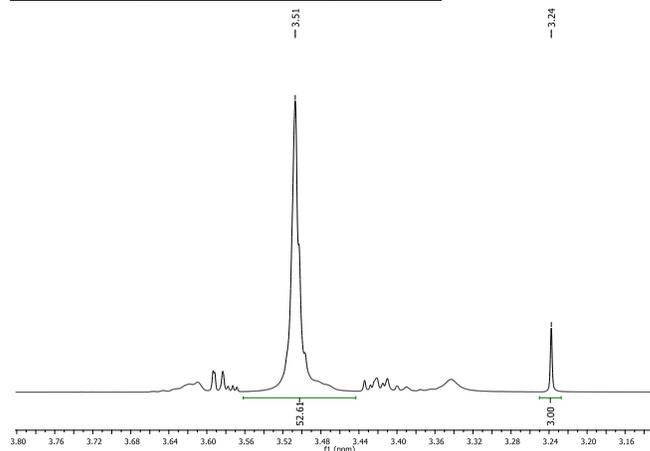
**Solubility:**

Poly(ethyl glycol) is soluble in chloroform, toluene, THF, and water. The product is insoluble in hexane, ether, cold isopropanol, and ethanol.

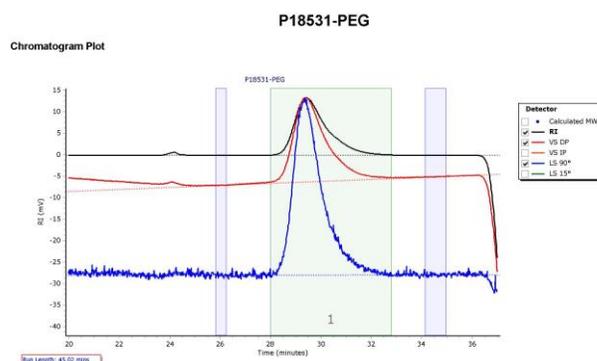
**Characterization:**

The molecular weight and polydispersity index were obtained by size exclusion chromatography (SEC) performed on [1] Varian liquid chromatograph equipped with UV and refractive detector, SEC columns from Supelco, and using THF containing 2 vol%  $(\text{Et})_3\text{N}$  as the eluent; and/or on [2] Agilent 1260 Infinity II multi-detector GPC/SEC system equipped with three columns, and using 2% acetic acid aqueous solution as an eluent.

**$^1\text{H}$  NMR spectrum of the polymer:**



**SEC chromatogram of PEG in water:**



Mn	Mw	PDI
600	630	1.05