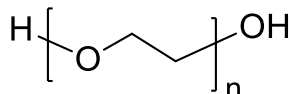


Sample name: Poly(ethylene glycol)

Other names: Poly(ethylene oxide), PEG, PEO

Sample # P9101-EG2OH(PEO)

Structure:

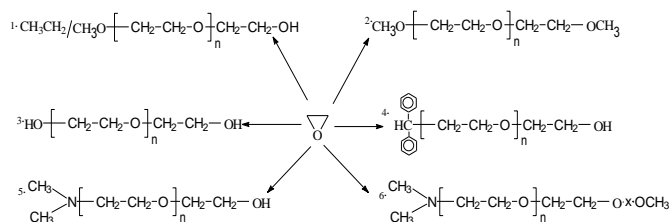


Composition:

$M_n \times 10^3$ (g/mol)	PDI
13	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) $\text{CH}_3\text{OCH}_2\text{CH}(\text{CH}_3)\text{OK}$	α , ω -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) $(\text{CH}_3)_2\text{N}-\text{CH}_2\text{CH}_2\text{OK}$	methyl amino terminated PEG
6) $(\text{CH}_3)_2\text{N}-\text{CH}_2\text{CH}_2\text{OK}$	α -methyl amino ω -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 Al_2O_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°C .

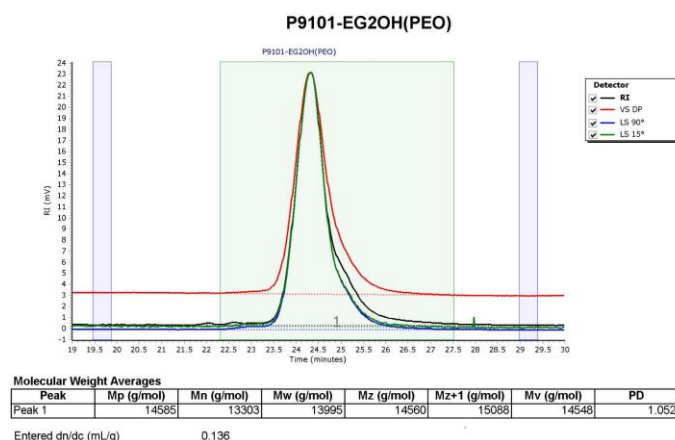
Solubility:

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.

SEC chromatogram of PEG in water:



SEC chromatogram of PEG in THF:

