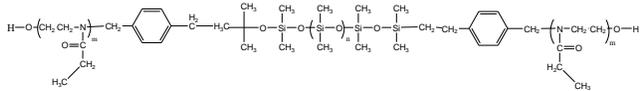


### Sample Name:

Poly(2-ethylloxazoline-b-dimethylsiloxane-b-2-ethylloxazoline) Triblock Copolymer

Sample #: **P9168-EtOXZDMSEtOXZ**

### Structure:



### Composition:

Mn x 10 <sup>3</sup>	PDI
1.0-b-4.0-b-1.0	1.7
Dp of each units: ( 10-b-54-b-10)	

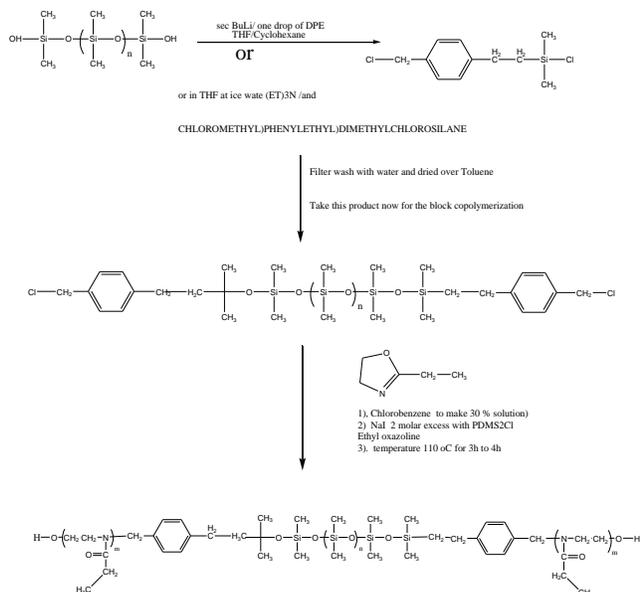
### Synthesis Procedure:

The  $\alpha$ - $\omega$  dihydroxy terminated Poly(2-ethylloxazoline-b-dimethylsiloxane-b-2-ethylloxazoline) triblock copolymer was prepared by combination of anionic living polymerization of hexamethylcyclotrisiloxane (D3) and cationic polymerization of 2-ethyl oxazoline, using difunctional initiator. Polymer was treated with equivalent amount of end functional moieties with NaOH/Methanol. Polymer was recovered in cold acetone, wash couple of times with cold acetone to remove the unreacted any trace amount of monomer.

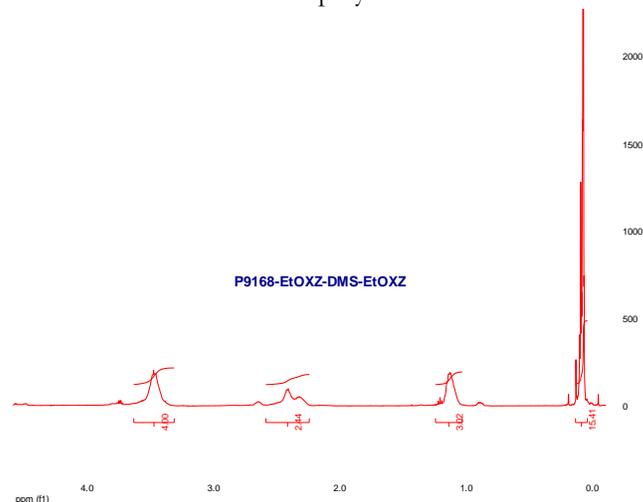
### Characterization:

**Central Block:** The molecular weight and polydispersity index of the poly(ethylene oxide) block was determined by size exclusion chromatography (SEC) using a Varian liquid chromatograph equipped with a UV and refractive index detector. The chemical composition was extracted from proton NMR, which was recorded from Varian 500MHz instrument using CDCl<sub>3</sub> as solvent.

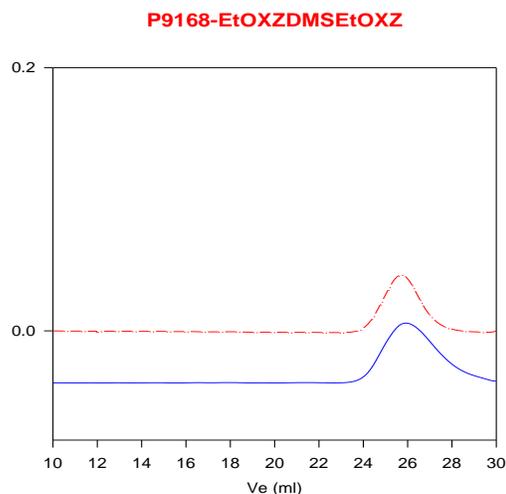
The reaction of polymerization can be illustrated as follows:



H NMR of the Triblock copolymer:



SEC for the triblock polymer:

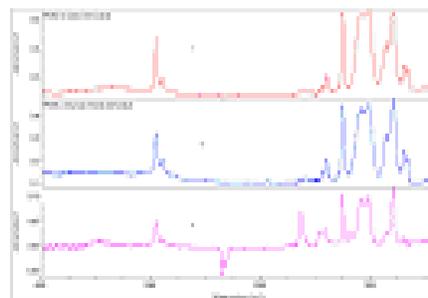


Size exclusion chromatography of the polymer

- Polydimethyl siloxane disilanol  $M_n=4000$ ,  $M_w=5400$ ,  $M_w/M_n=1.3$
- Poly(ethylloxazoline-b-dimethyl siloxane-b-ethyl oxazoline)
- Mn: PEtOXZ(1000)-b-PDMS(4000)-b-PEtOXZ(1000)  $M_w/M_n=1.7$

### FTIR Spectra of the Products:

- PDMS  $\alpha$ - $\omega$ -disilanol terminated.
- PDMS-  $\alpha$ - $\omega$ - dibenzyl chloride terminated PDMS
- EtOXZ-DMS-EtOXZ triblock copolymer



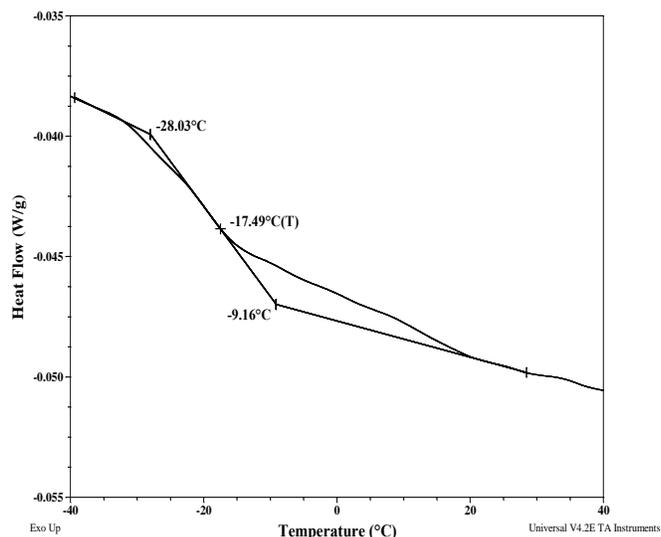
## Thermal analysis of the sample# P9168- EtOXZDMSEtOXZ

Thermal analysis of the samples was carried out on a TA Q100 differential scanning calorimeter at a heating rate of 10°C/min. The midpoint of the slope change of the heat flow plot of the second heating scan was considered as the glass transition temperature ( $T_g$ ).

### Thermal analysis results at a glance

For PDMS block		
$T_g$ : -127°C (lit. value)	$T_m$ : 53°C	$T_c$ : 20°C
For EtOXZ block		
$T_g$ : -17°C	$T_m$ : -	$T_c$ : -

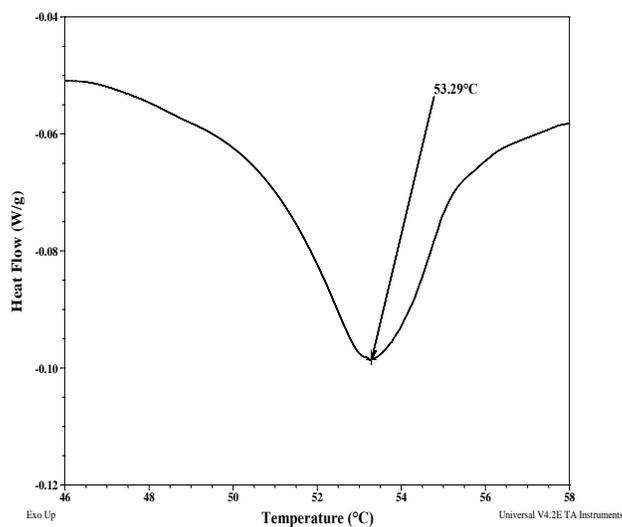
### Thermogram for EtOXZ block:



### Melting and crystallization curve for the sample

The melting temperature ( $T_m$ ) was taken as the maximum of the endothermic peak where as the crystallization temperature ( $T_c$ ) was considered as the minimum of the exothermic peak.

### Melting curve for PDMS block:



### Crystallization curve For PDMS block:

