

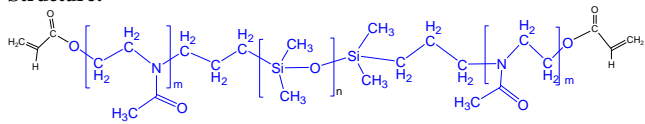
Sample Name:

Acrylate End Functionalized Poly(2-methyloxazoline-b-dimethylsiloxane-b-2-methyloxazoline) Triblock Copolymer

Copolymer

Sample #: **P3691A—AMOXZDMSMOXZA**

Structure:



Composition:

Mn x 10 ³	PDI
1.2-b-2.5-b-1.2	-1.3

Synthesis Procedure:

The α - ω dihydroxy terminated Poly(2-methyloxazoline-b-dimethylsiloxane-b-2-methyloxazoline) triblock copolymer was prepared by combination of anionic living polymerization of hexamethylcyclotrisiloxane (D3) and cationic polymerization of 2-methyl oxazoline, using difunctional initiator. The acryloyl end-group was achieved quantitatively by terminating reaction with acrylic acid in the presence of triethyl amine. The termination reaction was carried out at 40 °C for 3 days. Polymer was recovered in cold acetone, wash couple of times with cold acetone to remove the unreacted acrylic acid and other side products.

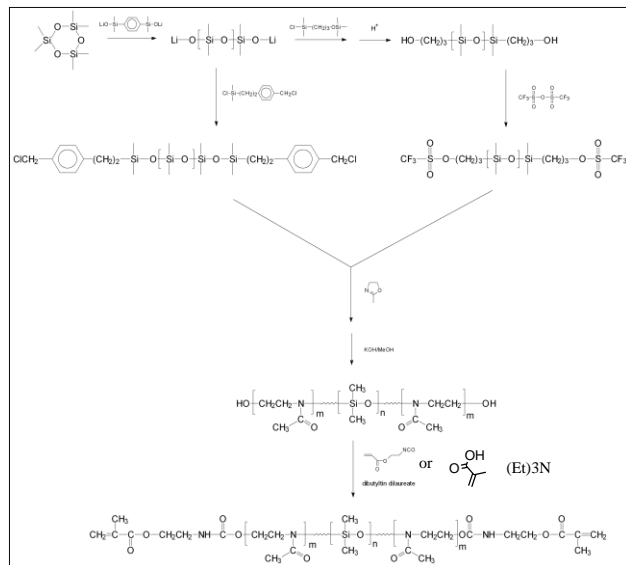
Characterization:

Central Block: Size exclusion chromatography (SEC): Varian liquid chromatograph equipped with UV and refractive detector. SEC columns from Supelco were used with THF (or toluene) as the eluent. The columns were calibrated with monodisperse poly(dimethyl siloxane). The molecular weights and the polydispersity indices were calculated. The SEC of the block copolymer, the elution of the polymer retarded this may be due to the interaction of the block copolymer with the column packing material. From the SEC profile only the Mw/Mn was considered and from the ¹H NMR the composition was determined.

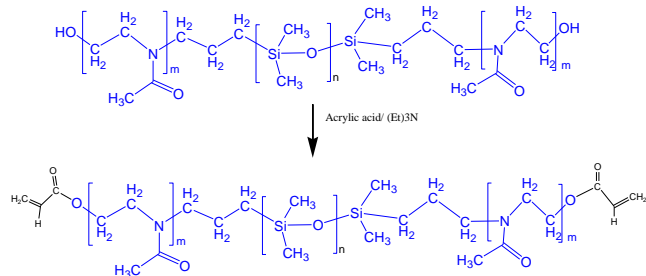
Side Block: The chemical composition was extracted from proton NMR, which was recorded from Varian 500MHz instrument using CDCl₃ as solvent. The molecular weight of side block was calculated based on the molecular weight of central block and the chemical composition. The polydispersity index of block copolymer was obtained by SEC as described above.

Functionality: The end-groups for each step were determined by ¹H NMR as mentioned above.

The reaction of polymerization can be illustrated as follows:

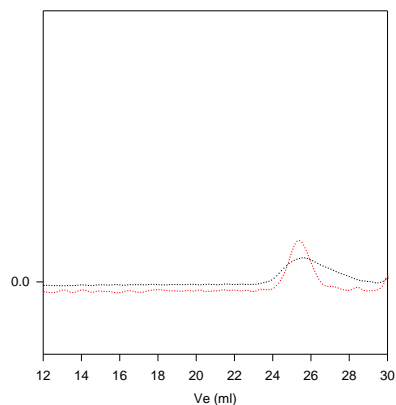


Or



SEC of Sample:

P3691A-MOXZDMSMOXZ



Size exclusion chromatography of poly(methyloxazoline-b-dimethylsiloxane-b-methyloxazoline)
Polydimethylsiloxane $M_n=2500$, $M_w=3200$, $PDI=1.3$
Triblock copolymer: Strong interaction with the column packing materials in THF as eluent
Composition from ¹H NMR: MOXZ-b-DMS-b-MOXZ
Mn: 1200-b-2500-b-1200
Acrylate functionality: 2.0
degree of polymerization: MOXZ₍₁₄₎-b-DMS₍₃₃₎-b-MOXZ₍₁₄₎

The block copolymer cannot be eluted in our SEC, the composition of the block copolymer was determined from the HNMR by knowing the molecular mass of the starting PDMS dicarbinol terminated PDMS: Mn 2500.

The composition was;

(14) methyloxazoline-b-(33) PDMS-b-(14) methyloxazoline

¹H NMR of the Polymer:

