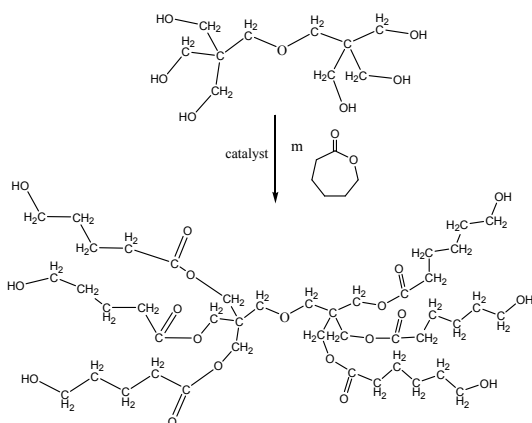


### Six arm Poly( $\epsilon$ -caprolactone) bearing core of dipentaerythritol

The diagram illustrates a complex polyurethane polymer chain. It features several repeating units connected by urethane linkages ( $-NH-CO-O-$ ). The structure includes various hydroxyl groups ( $-OH$ ) and ether linkages ( $-O-$ ). Some units are highlighted in a shaded box, indicating specific functional groups or structural motifs. The overall structure is a branched network of these units.

Mn x 10 <sup>3</sup> (branch)	PDI
0.130 ( Mn total 0.938)	1.2
Solubility in DMF, and in Acetone	

The polymer was prepared by ring opening polymerization of caprolacton using Tin octoate as the catalyst and dipentaerythritol Mn of 254.



The Mn of the polymer is calculated from <sup>1</sup>H-NMR spectroscopy by comparing the peak area of the core protons at about 3.6 ppm with the ε-caprolactone protons at about 4.1 ppm. Polydispersity is determined by size exclusion chromatography (SEC): Varian liquid chromatograph equipped with UV and refractive detector. SEC columns from Supelco were used with THF containing 2 vol% (Et)<sub>3</sub>N as the eluent.

Purification of the obtained polymer was carried out rigorously as discussed below to ensure the removal of the catalyst and traces amount of unreacted 4-hydroxy core based on pentaerythritol.

1. Dissolved the polymer dichloromethane, solution filtered and then passed through a column packed with basic  $\text{Al}_2\text{O}_3$ .
2. Solution concentrated on rota-evaporator
3. Solution precipitated in cold diethyl ether.
4. Dried under vacuum for 48h at 150 °C to remove any low molecular weights oligomeric species

P10545-1 Dipentaerythritol in DMSO

Chemical structure of P10545-1 Dipentaerythritol in DMSO is shown. The structure is a dipentaerythritol derivative, featuring a central ether linkage connecting two pentaerythritol units. The structure is labeled with chemical shifts (2.0, 3.45, 3.29) and integration values (1.0, 1.1, 5.0) corresponding to the peaks in the  $^1\text{H}$  NMR spectrum.

The  $^1\text{H}$  NMR spectrum (400 MHz, DMSO- $d_6$ ) shows the following peaks and integrations:

- Peak at ~4.5 ppm (OH, 2.0) with integration 1.0.
- Peak at ~3.5 ppm (CH<sub>2</sub>, 3.29) with integration 1.1.
- Peak at ~3.4 ppm (CH, 3.45) with integration 5.0.