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Supporting Information

for

Investigation of cationic ring-opening polymerization of 2-oxazolines in the “green” solvent dihydrolevoglucosenone

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Additional figures and spectra

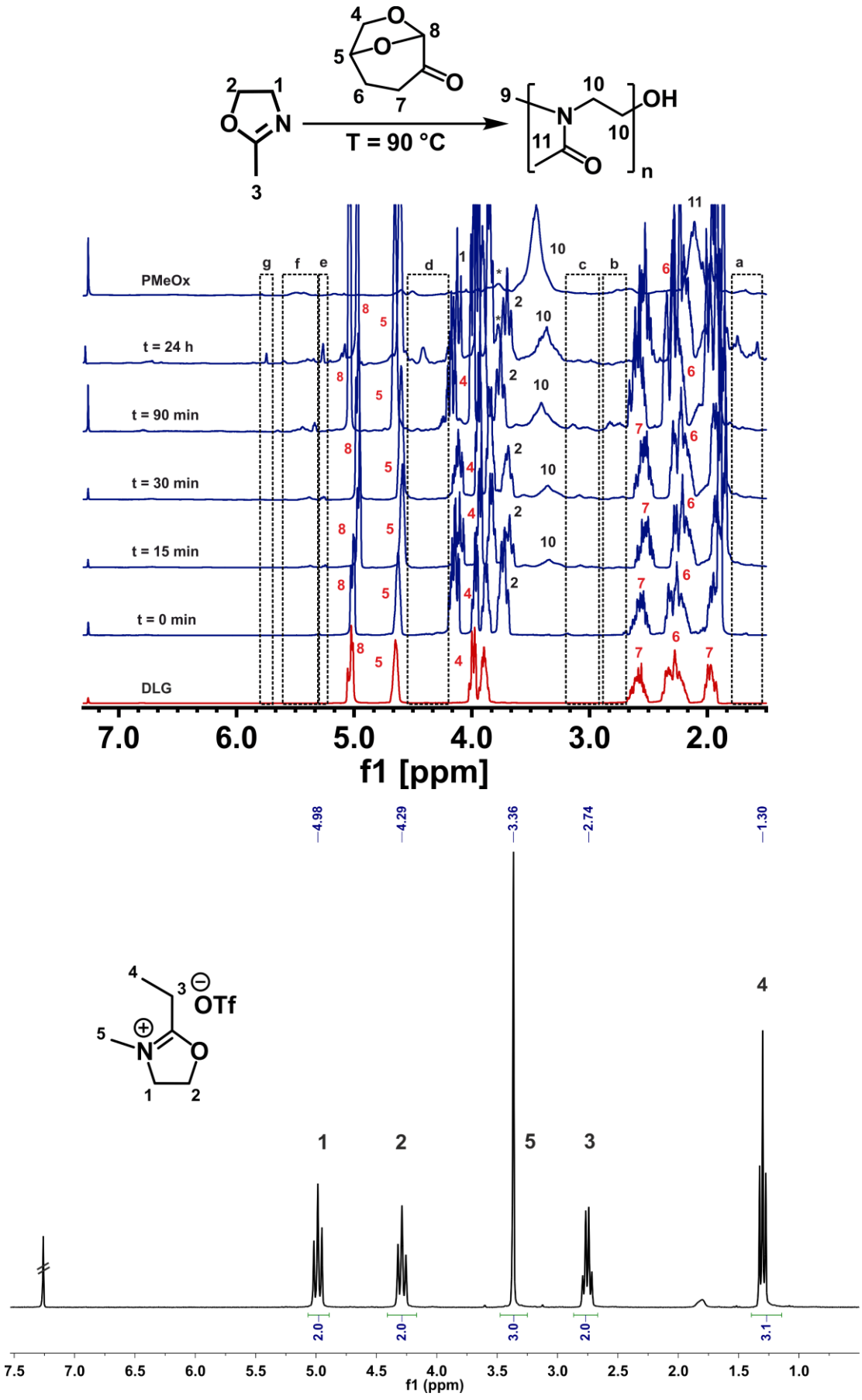


Figure S2. *^{1}H-NMR spectrum (300MHz, $CDCl_3$) of 2-ethyl-3-methyloxazoliniumtriflat after purification.*

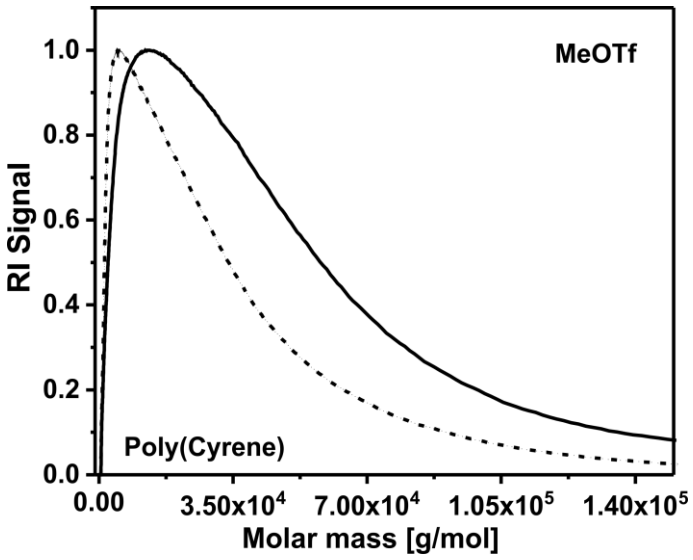


Figure S3. *HFIP SEC traces of the product obtained after incubation of dihydrolevoglucosenone with MeOTf at 90 °C.*

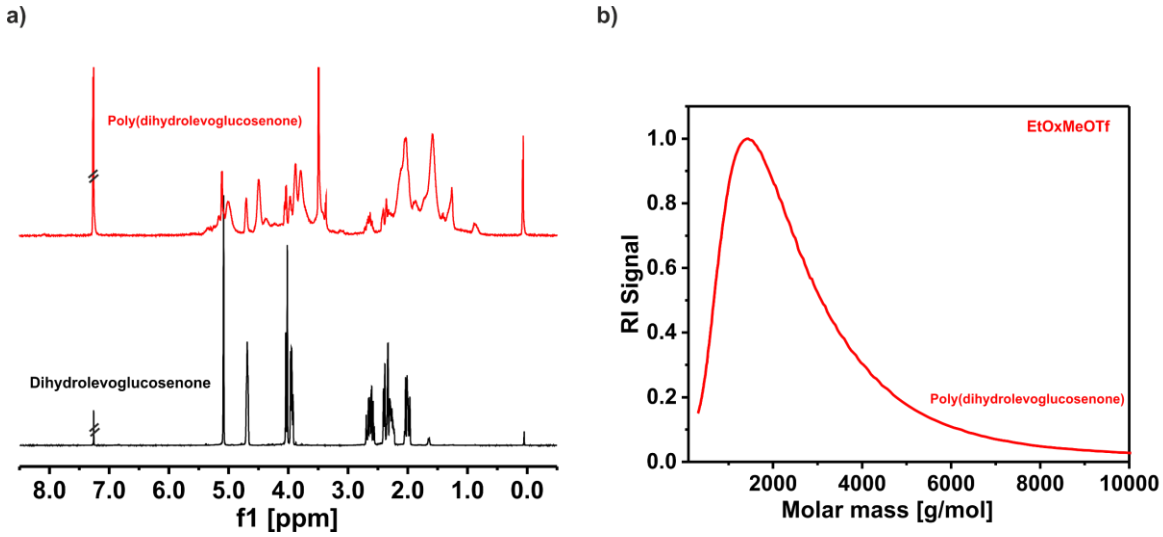


Figure S4. *^{1}H NMR spectra ($CDCl_3$, 300 MHz) obtained after incubation of dihydrolevoglucosenone with EtOxMeOTf at 0°C with worming up to room temperature for 24 h (red). b) SEC trace of the resulting polymer after incubation of dihydrolevoglucosenone with EtOxMeOTf.*

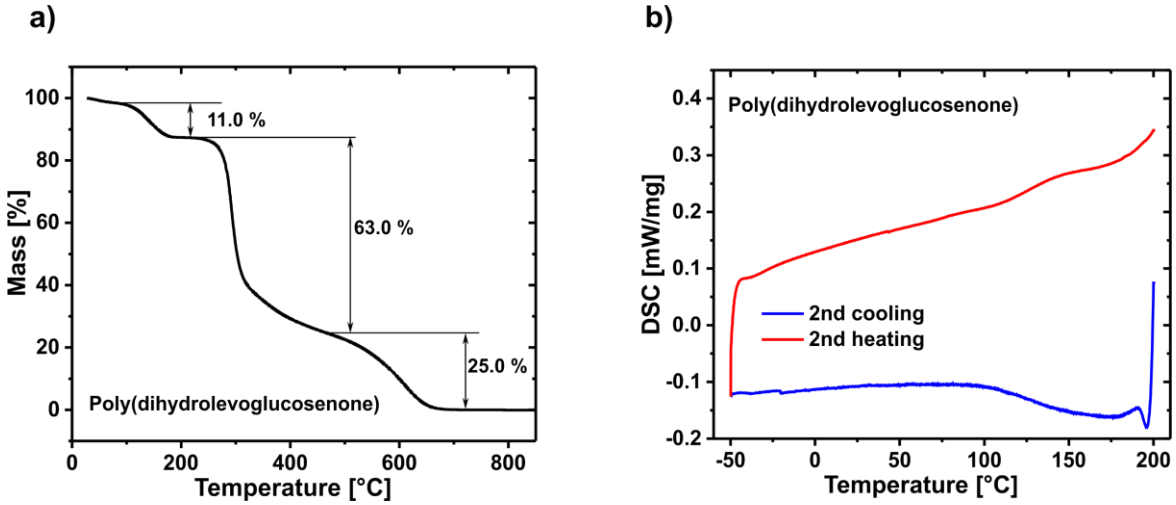


Figure S5. *a) Thermogravimetric analysis (TGA) and b) differential scanning calorimetry (DSC) second heating curve (heating rate: 10 K min^{-1}) of the poly(dihydrolevoglucosenone) obtained after incubation of dihydrolevoglucosenone with MeOTf at 90 °C for 5 minutes.*

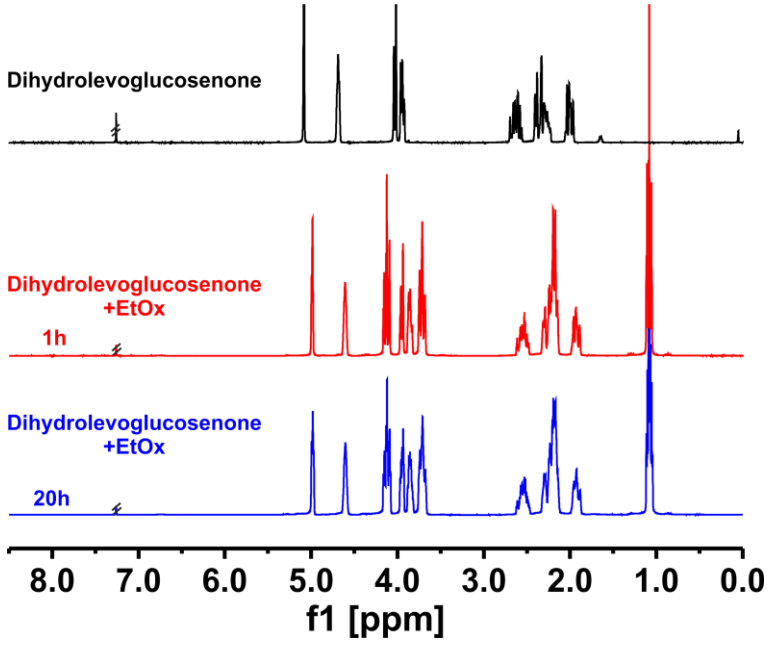


Figure S6. *^{1}H NMR ($CDCl_3$, 300 MHz) spectra obtained during the incubation of dihydrolevoglucosenone with 2-ethyl-2-oxazoline at 90 °C up to 20 h.*

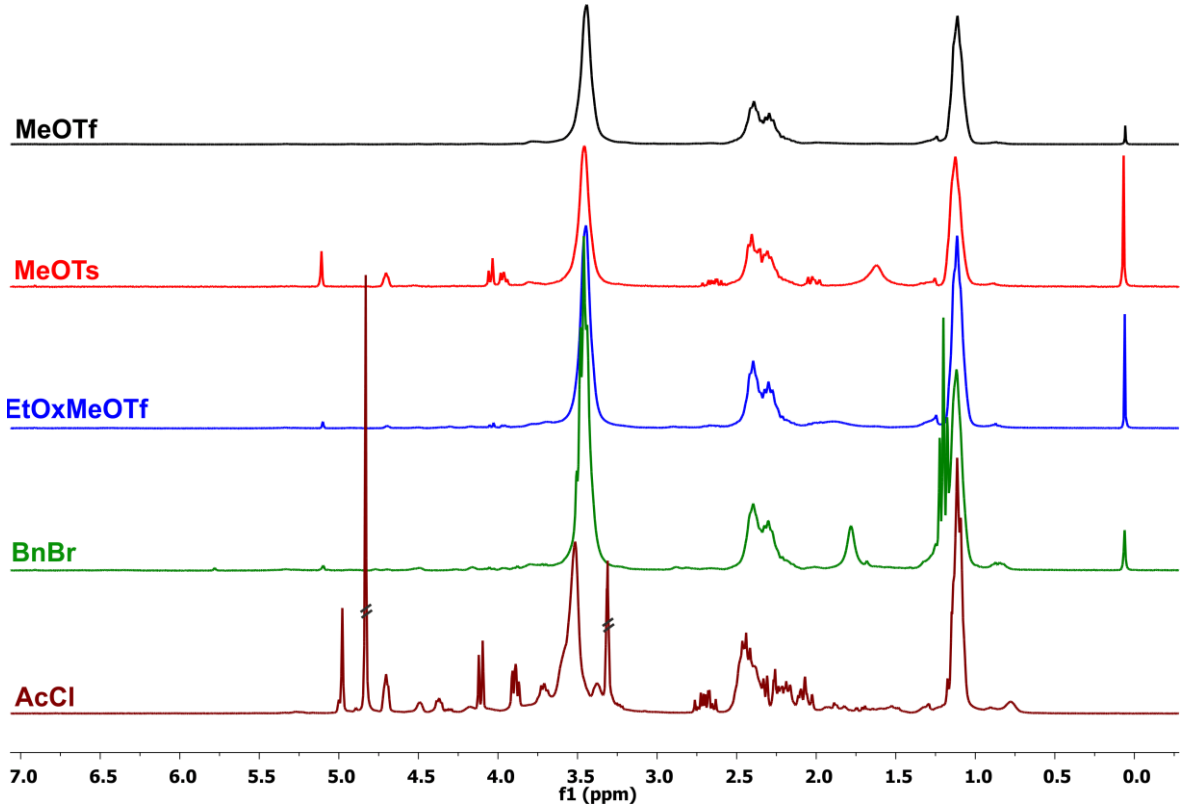


Figure S7. *^{1}H NMR (CDCl3, 300 MHz) spectra of poly(2-ethyl-2-oxazoline) after precipitation using methyl triflate (black), methyl tosylate (red), 2-ethyl-3-methyl-2-oxazoline triflate (blue), benzyl bromide (green) and acyl chloride (dark red) as initiator in dihydrolevoglucosenone.*

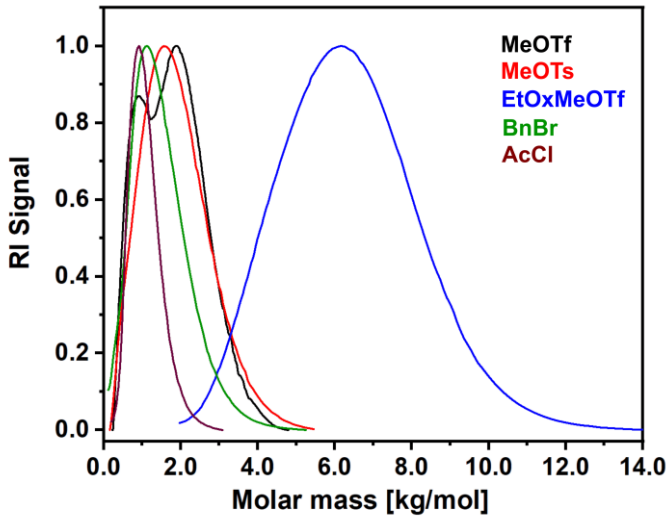
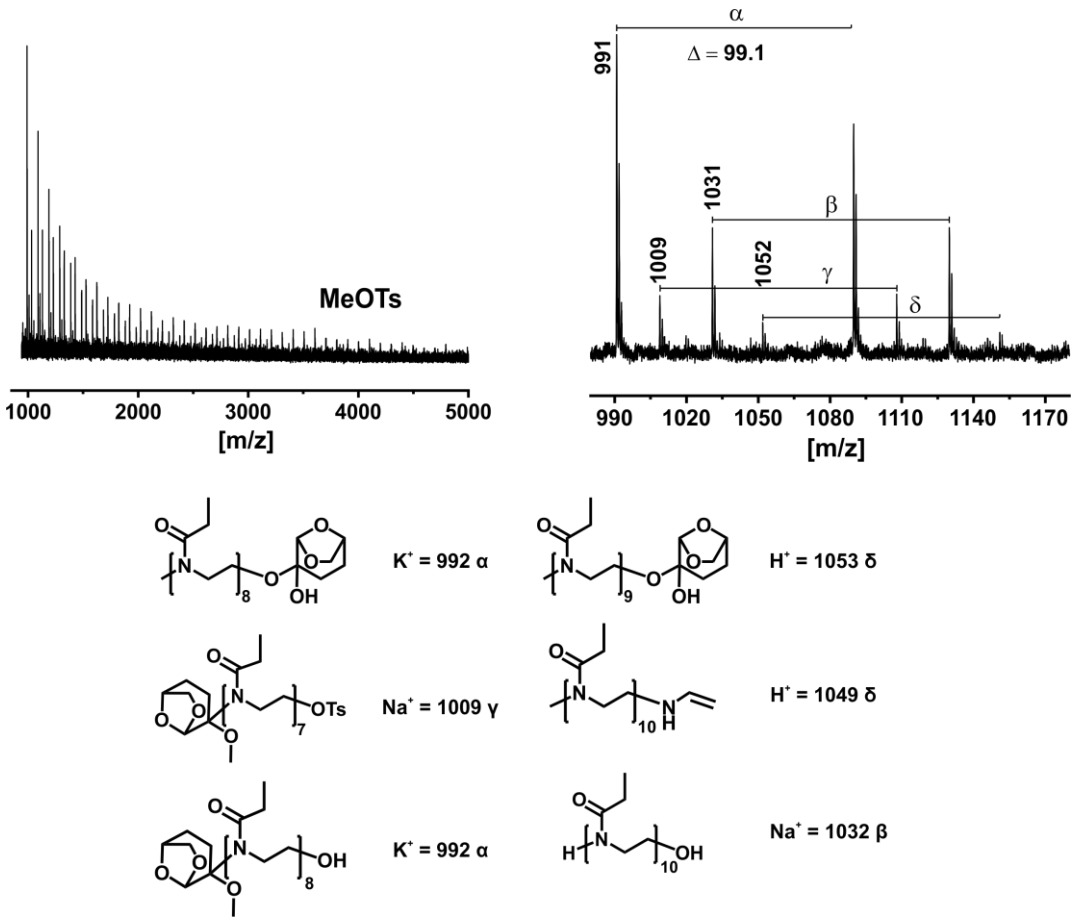


Figure S8. *HFIP SEC traces of the precipitated poly(2-ethyl-2-oxazoline)s obtained in dihydrolevoglucosenone using methyl triflate (black), methyl tosylate (red), 2-ethyl-3-methyl-2-oxazoline triflate (blue), benzyl bromide (green) and acyl chloride (dark red) as initiator.*



FigureS9. *Maldi-ToF mass spectrometry analysis of the poly(2-ethyl-2-oxazoline) initiated with methyltosylate in dihydrolevoglucosenone at 90 °C.*

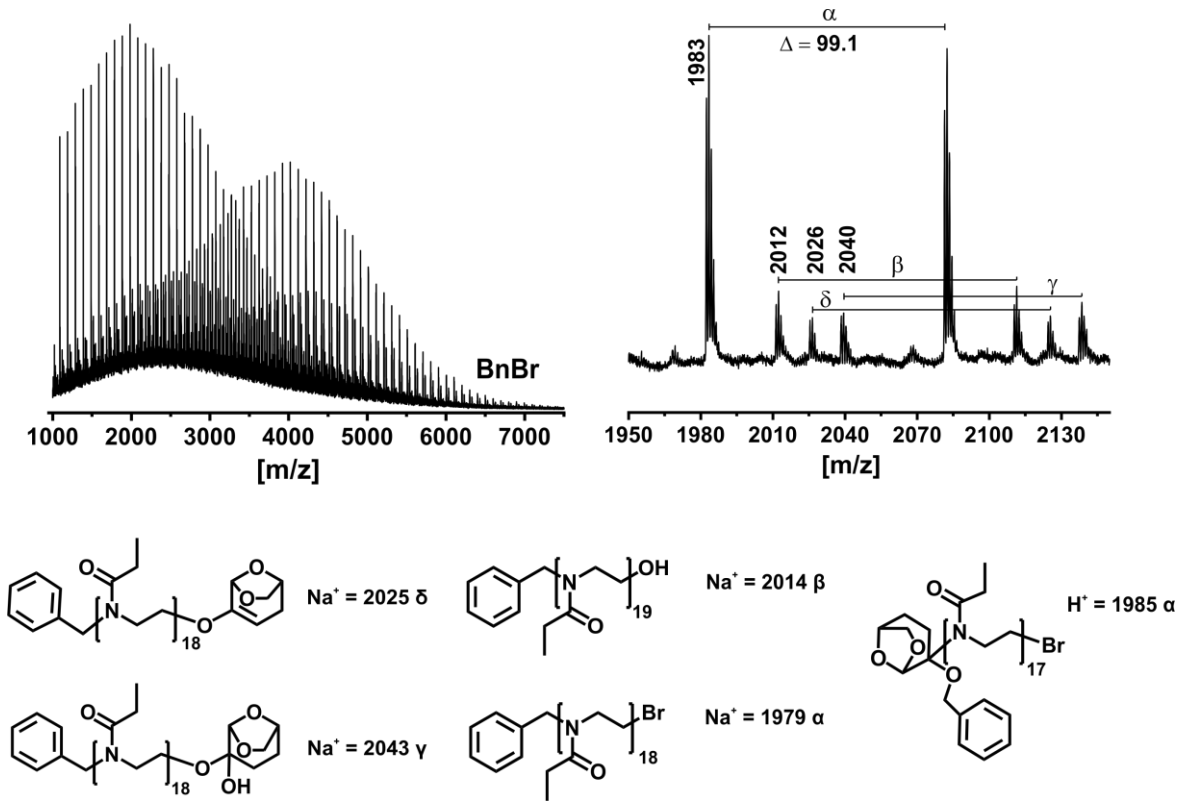


Figure S10. *Maldi-ToF mass spectrometry analysis of the poly(2-ethyl-2-oxazoline) initiated with benzyl bromide in dihydrolevoglucosenone at 90 °C.*

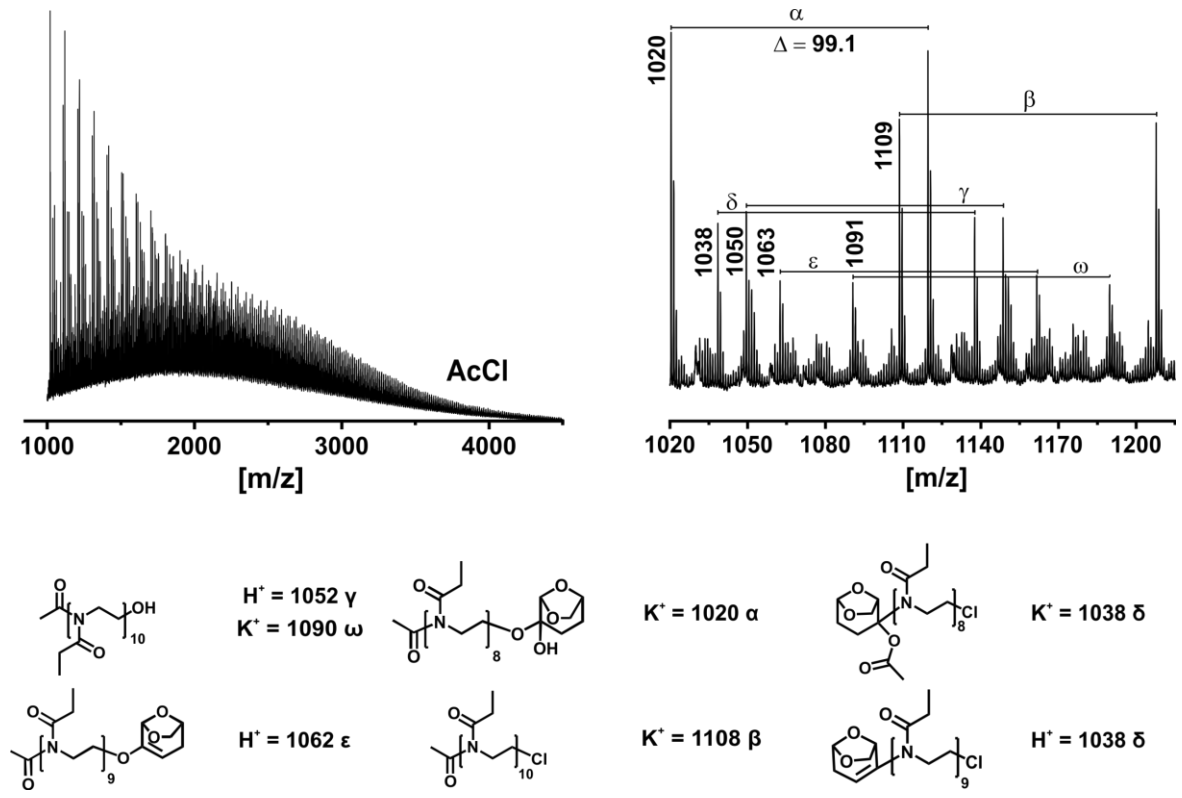


Figure S11. *Maldi-ToF mass spectrometry analysis of the poly(2-ethyl-2-oxazoline) initiated with acetyl chloride in dihydrolevoglucosenone at 90 °C.*

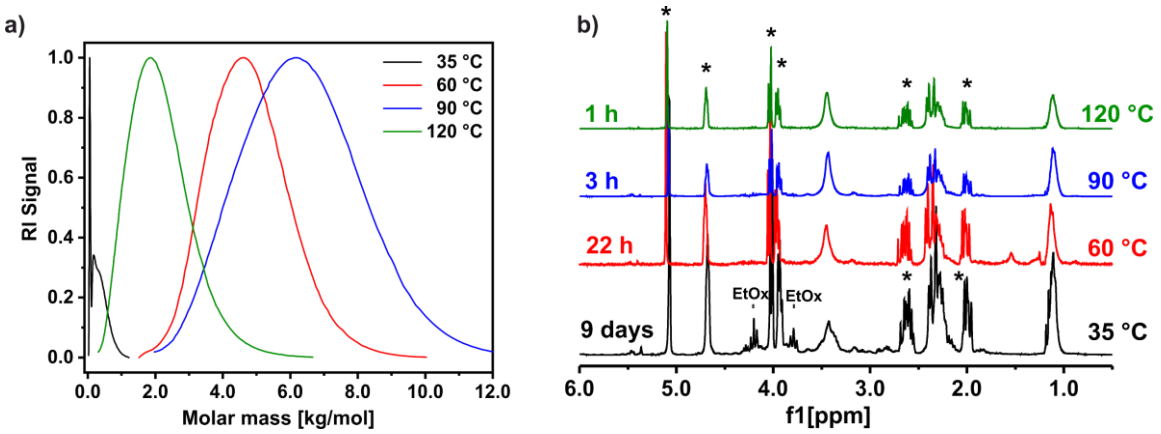


Figure S12. *Investigation of the effect of incubation temperature on 2-ethyl-2-oxazoline polymerization. (a) HFIP SEC traces of the resulting polymers after precipitation and dialysis; (b) ^{1}H NMR (300 MHz, CDCl3) analysis of the resulting poly(2-ethyl-2-oxazoline) polymer solution after complete monomer conversion at 35 °C (black), 60 °C (red), 90 °C (blue) and 120 °C (green). The peaks marked with asterisks are from the residual solvent signals.*

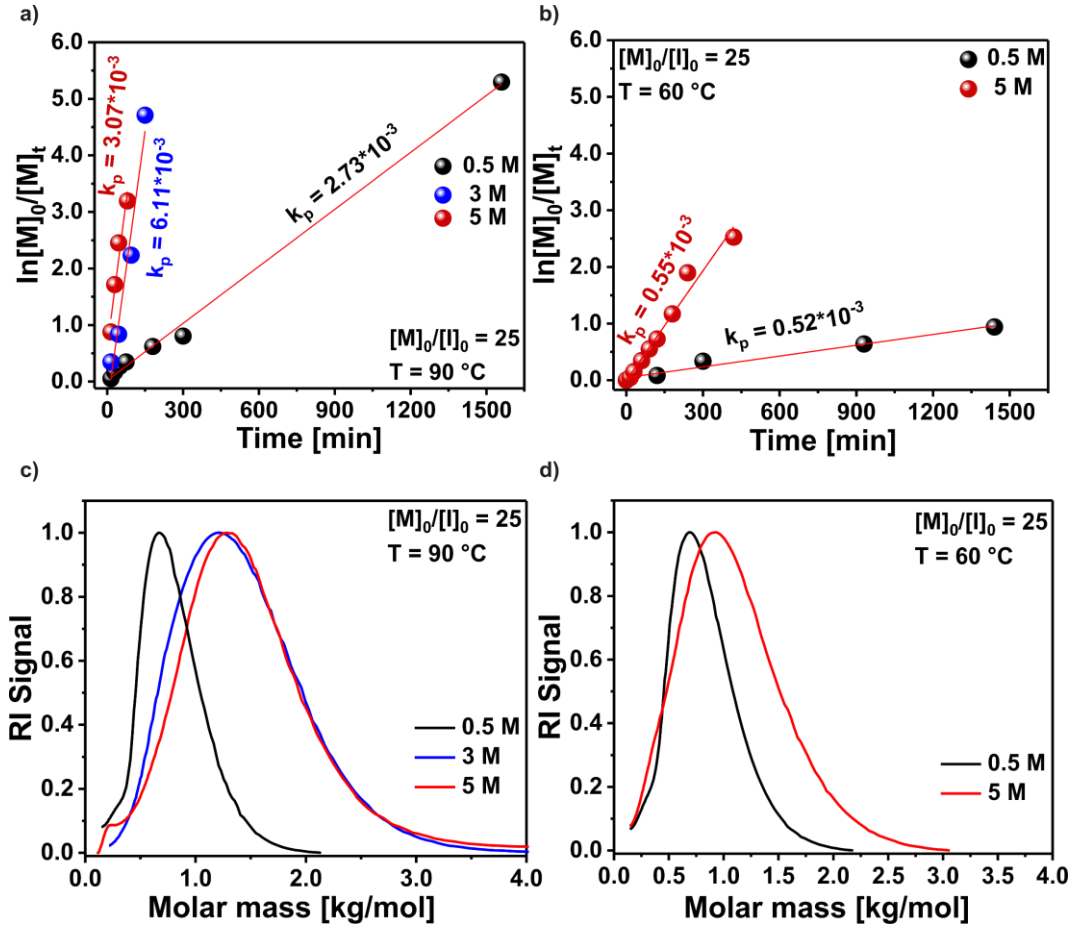


Figure S13. *Kinetic details obtained by NMR for the polymerization with different monomer concentration performed at 90 °C (a) and at 60 °C (b) and the SEC traces of the resulting polymers performed at 90 °C (c) and at 60 °C (d).*

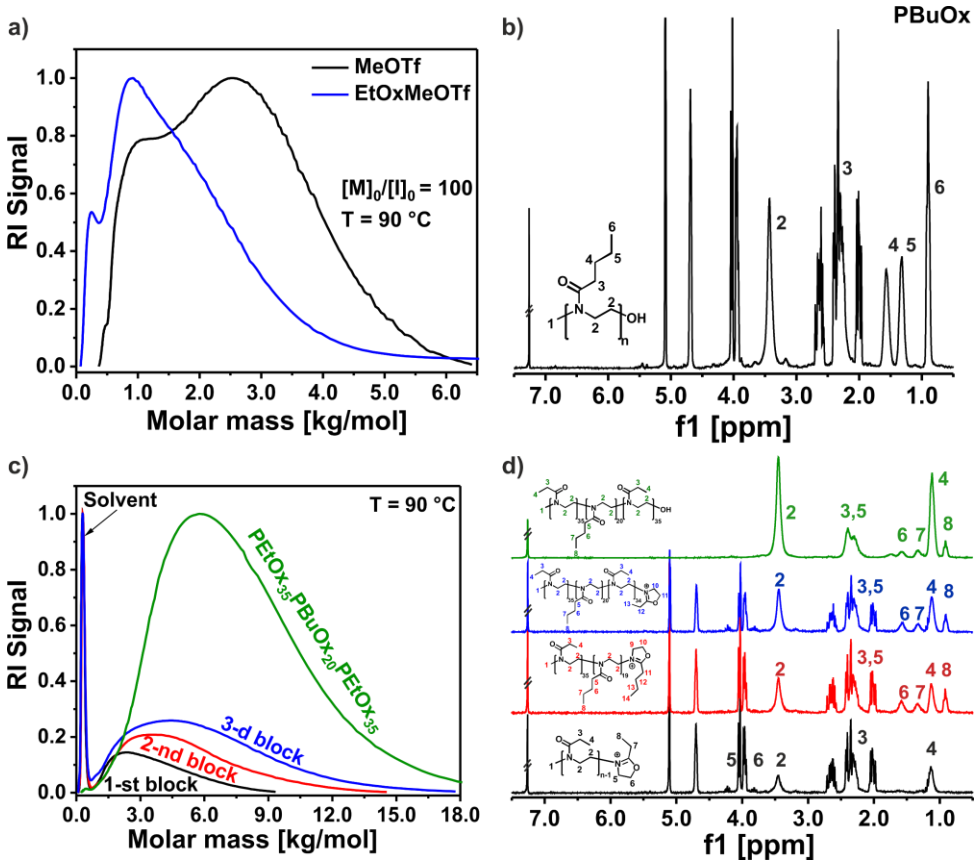


Figure S14. *a) SEC traces of the resulting poly(2-butyl-2-oxatoline) obtained after initiation with MeOTf and EtOxMeOTf at 90 °C in dihydrolevoglucosenone. b) ^{1}H NMR spectra of the resulting polymerization mixture during the BuOx polymerization. c) GPC traces of the resulting block co-polymer of EtOx and BuOx obtained after initiation with EtOxMeOTf at 90 °C in dihydrolevoglucosenone. d) ^{1}H NMR traces of the resulting block co-polymer of EtOx and BuOx obtained after initiation with EtOxMeOTf at 90 °C in dihydrolevoglucosenone.*