Electronic Supplementary Material (ESI) for Polymer Chemistry.

SUPPORTING INFORMATION

Controlled Ring-Opening Polymerization of *N*-(3-*tert*-Butoxy-3-oxopropyl) Glycine Derived *N*-Carboxyanhydrides towards Well-defined Peptoid-based Polyacids

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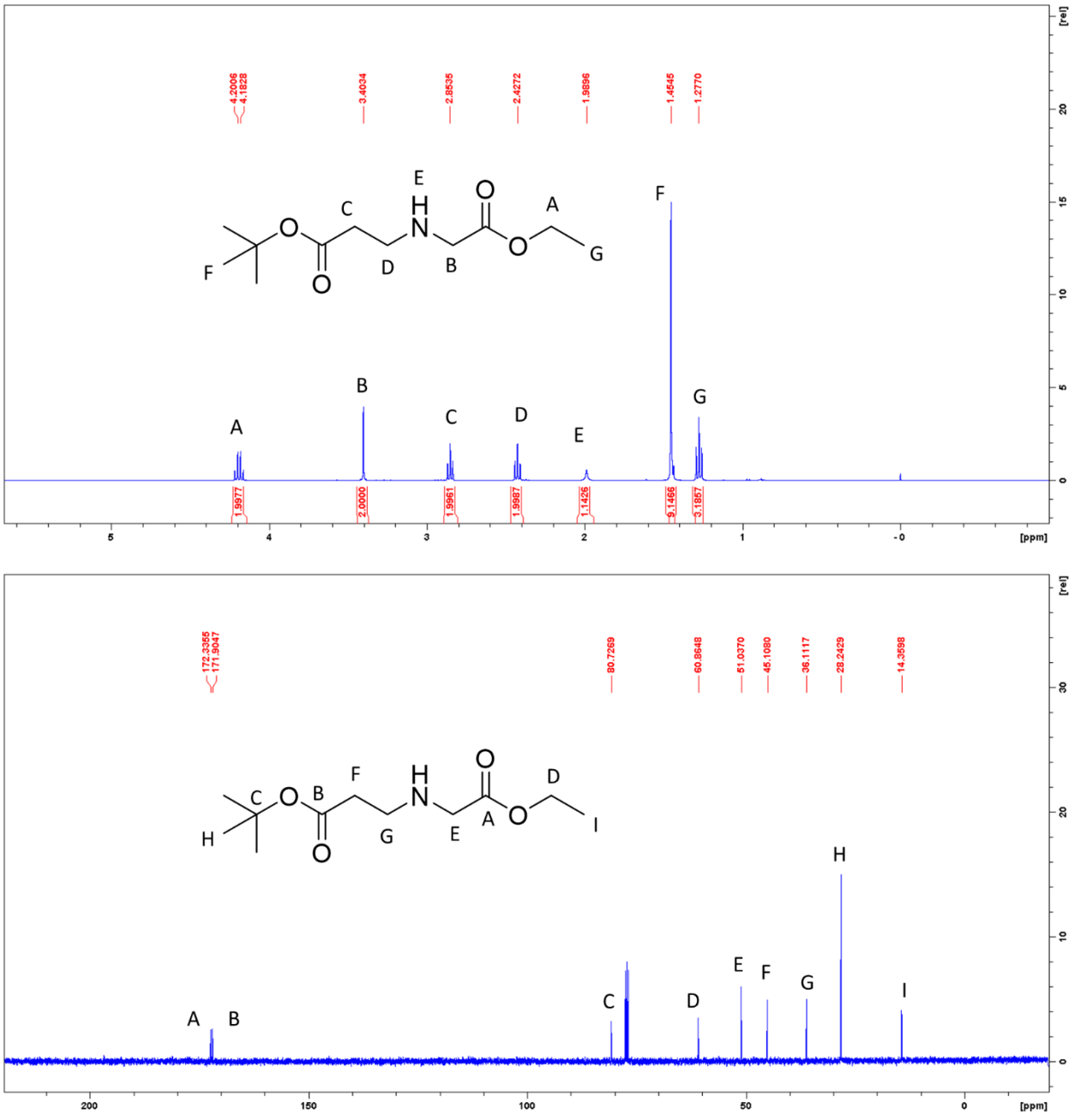

Figure S1. ^{1}H (top) and $^{13}C\{^{1}H\}$ NMR spectra (bottom) of 2-((3-*tert*-butoxy-3-oxopropyl)amino) acetic acid (**1**, Scheme 1) in $CDCl_3$.

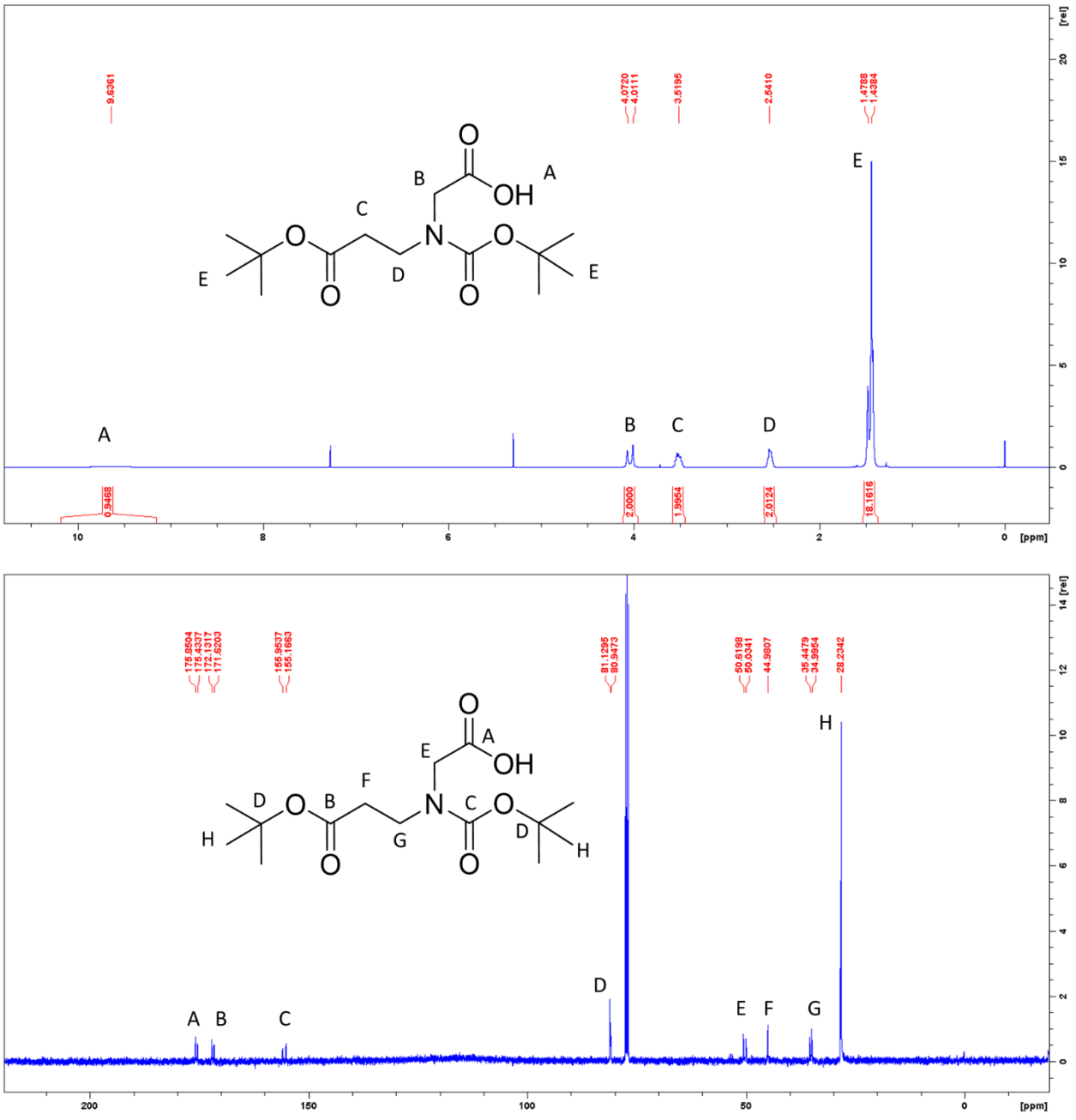

Figure S2. ^{1}H (top) and $^{13}C\{^{1}H\}$ NMR spectra (bottom) of 2-(*N*-(*tert*-butoxycarbonyl)-*N*-(3-*tert*-butoxy-3-oxopropyl) amino) acetic acid (**3**, Scheme 1) in $CDCl_3$.

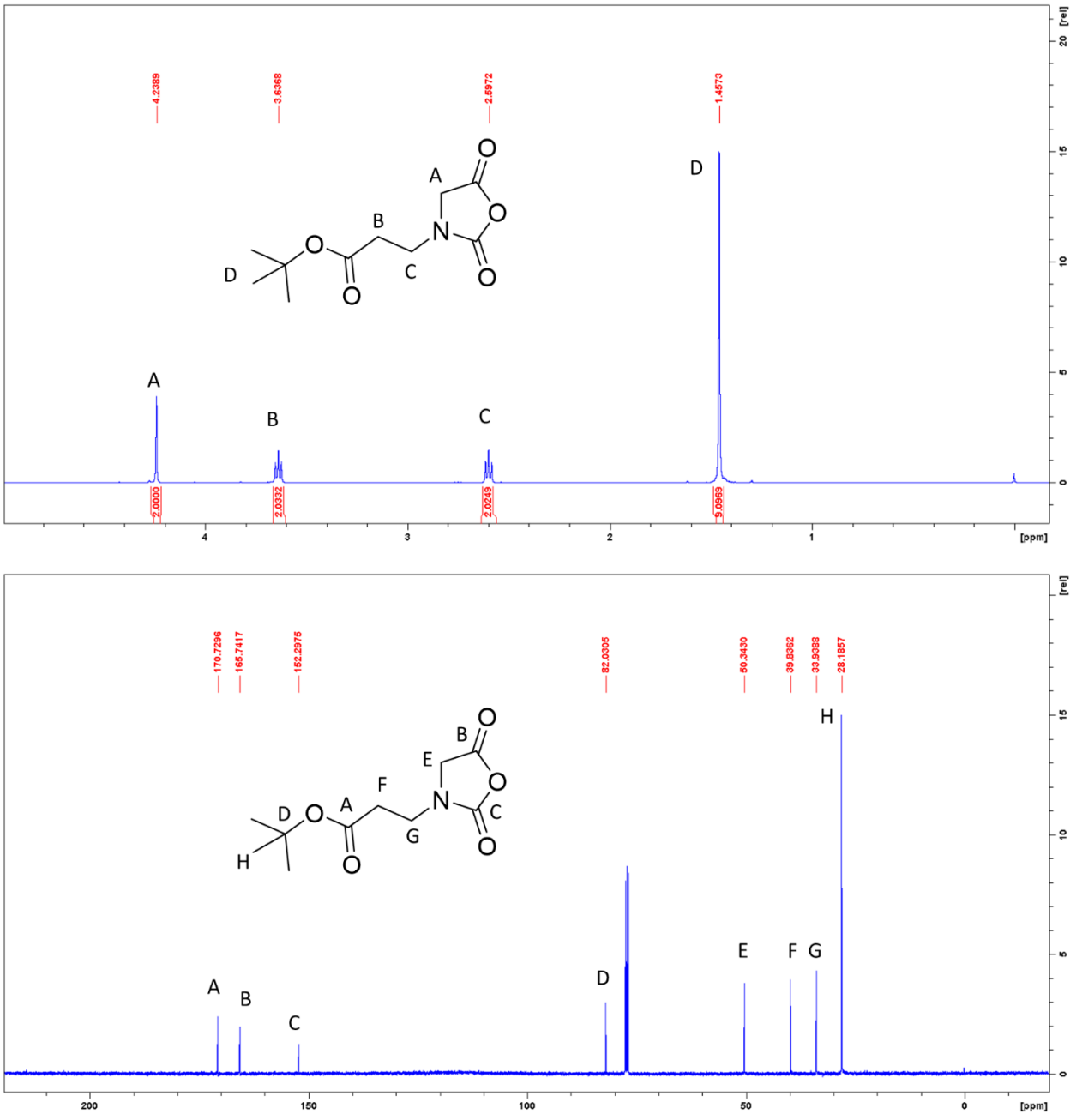

Figure S3. ^{1}H (top) and $^{13}C\{^{1}H\}$ NMR spectra (bottom) of *N*-(3-*tert*-butoxy-3-oxopropyl) glycine derived *N*-carboxyanhydride ($^{t}BuO_2Pr$-NCA, Scheme 1) in $CDCl_3$.

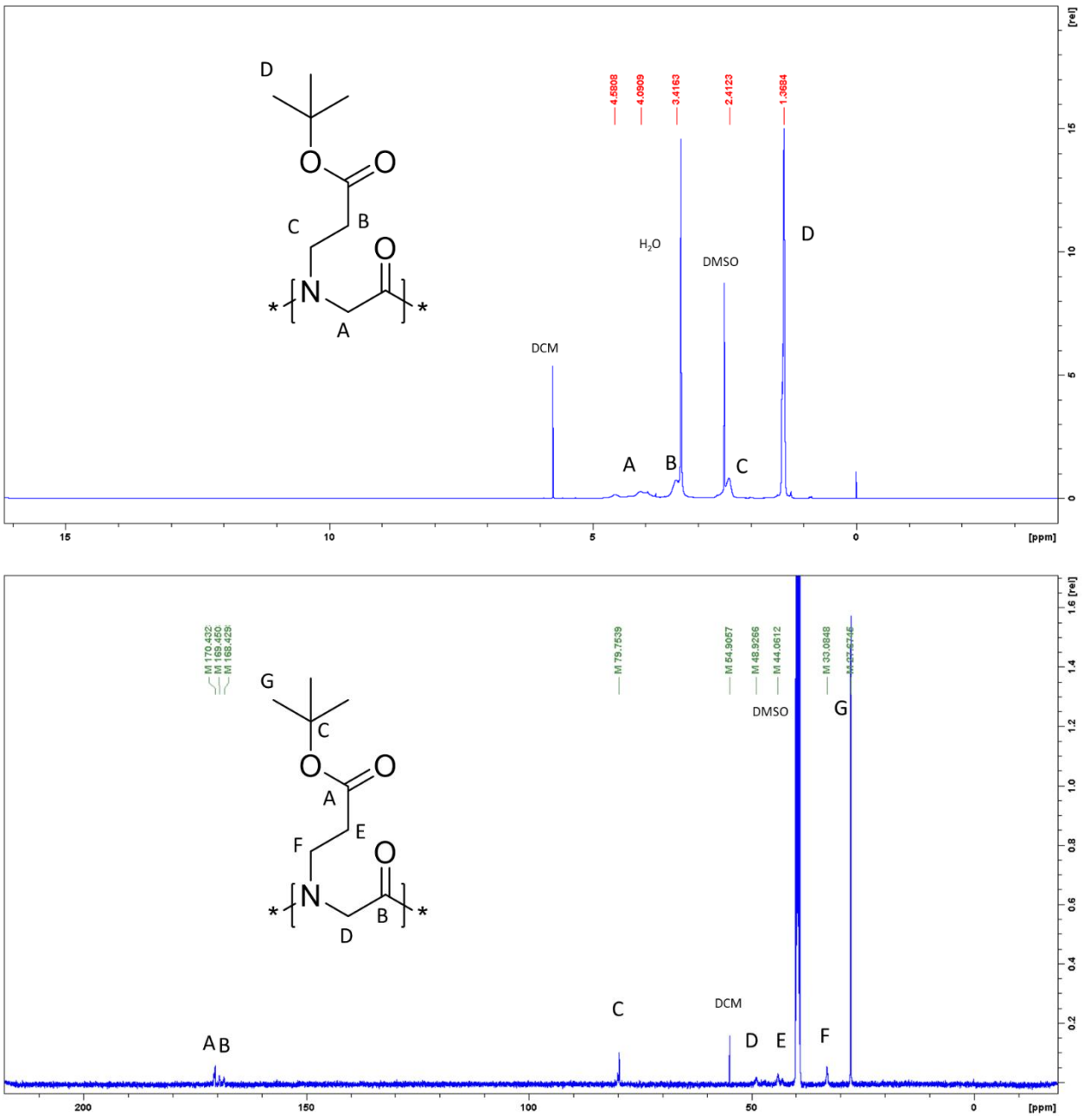

Figure S4. ^{1}H (top) and $^{13}C\{^{1}H\}$ NMR spectra (bottom) of poly(*N*-(3-*tert*-butoxy-3-oxopropyl) glycine) polymer in DMSO-d_6.

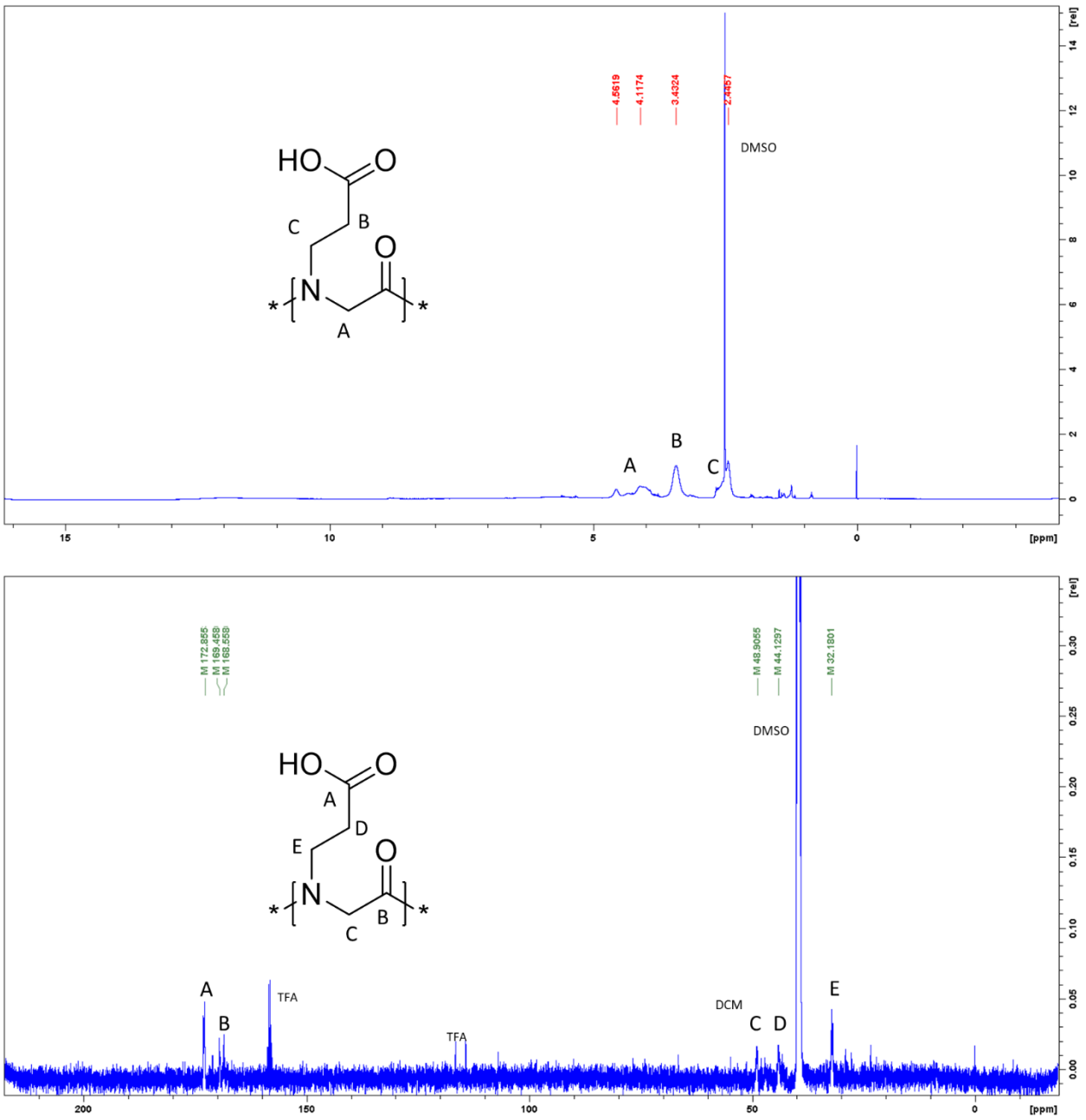

Figure S5. ^{1}H (top) and $^{13}C\{^{1}H\}$ NMR spectra (bottom) of poly(*N*-2-(carboxyethyl) glycine) polymer in DMSO-d_6.

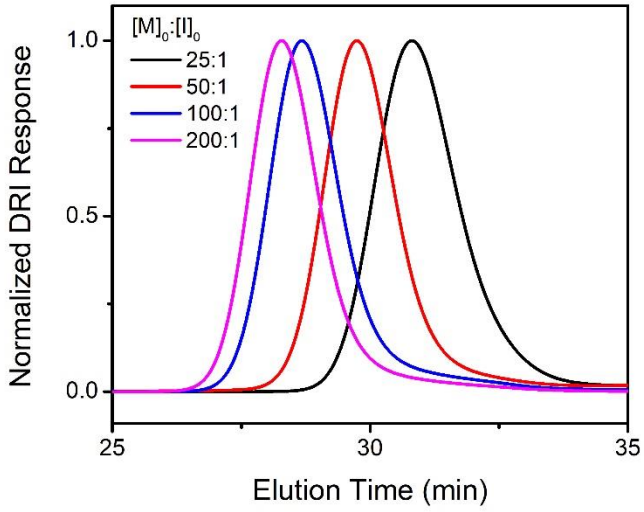

Figure S6. Plots of the SEC-DRI chromatograms for the butylamine-initiated ROPs of ^{t}BuO$_2$Pr-NCA in toluene at room temperature with different initial monomer-to-initiator ratios ([M]$_0$:[I]$_0$=25:1 – 200:1, Entry 6-9, Table 1).

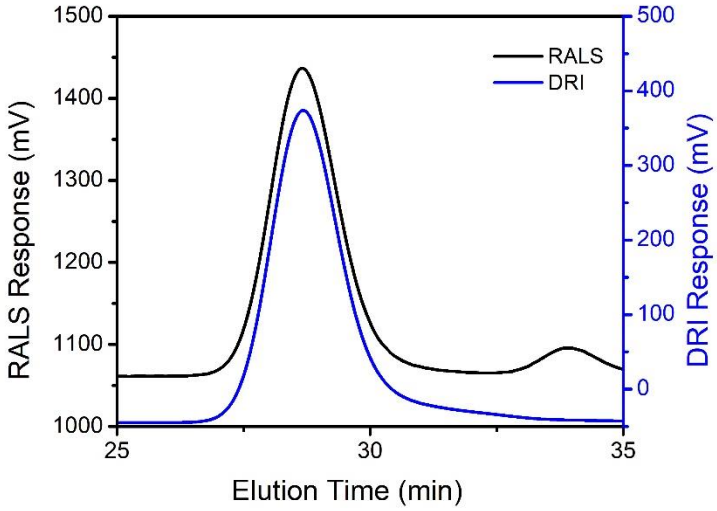

Figure S7. A representative SEC-MALS-DRI chromatogram of poly(*N*-(3-*tert*-butoxy-3-oxopropyl) glycine) polymers obtained from the butylamine-initiated ROPs of ^{t}BuO$_2$Pr-NCA ([M]$_0$ =0.5 M, [M]$_0$:[I]$_0$ = 100:1, in toluene, r.t.), showing the DRI (blue curve) and RALS response (black curve).

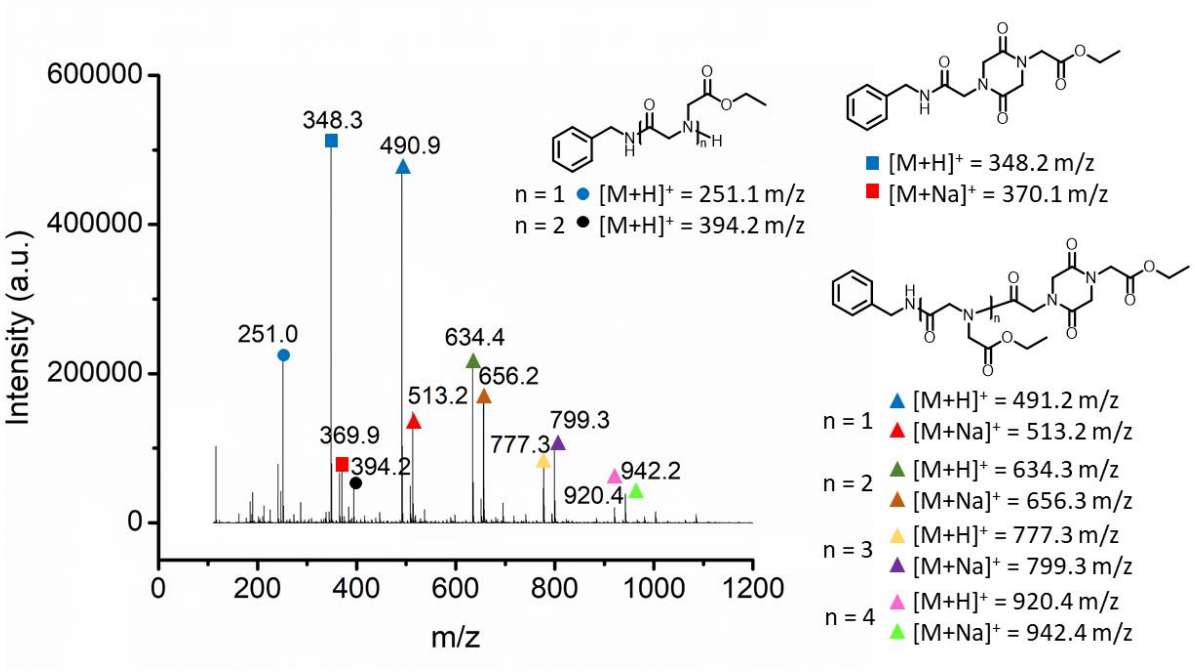

Figure S8. ESI-MS spectrum of oligomers obtained by benzylamine-initiated ROP of EtO_2Et-NCA in toluene at room temperature and the structural assignment of the molecular ions and corresponding calculated m/z values. Competitive termination by transamidation relative to chain propagation resulted in the formation of only low molecular weight oligomeric species shown here.

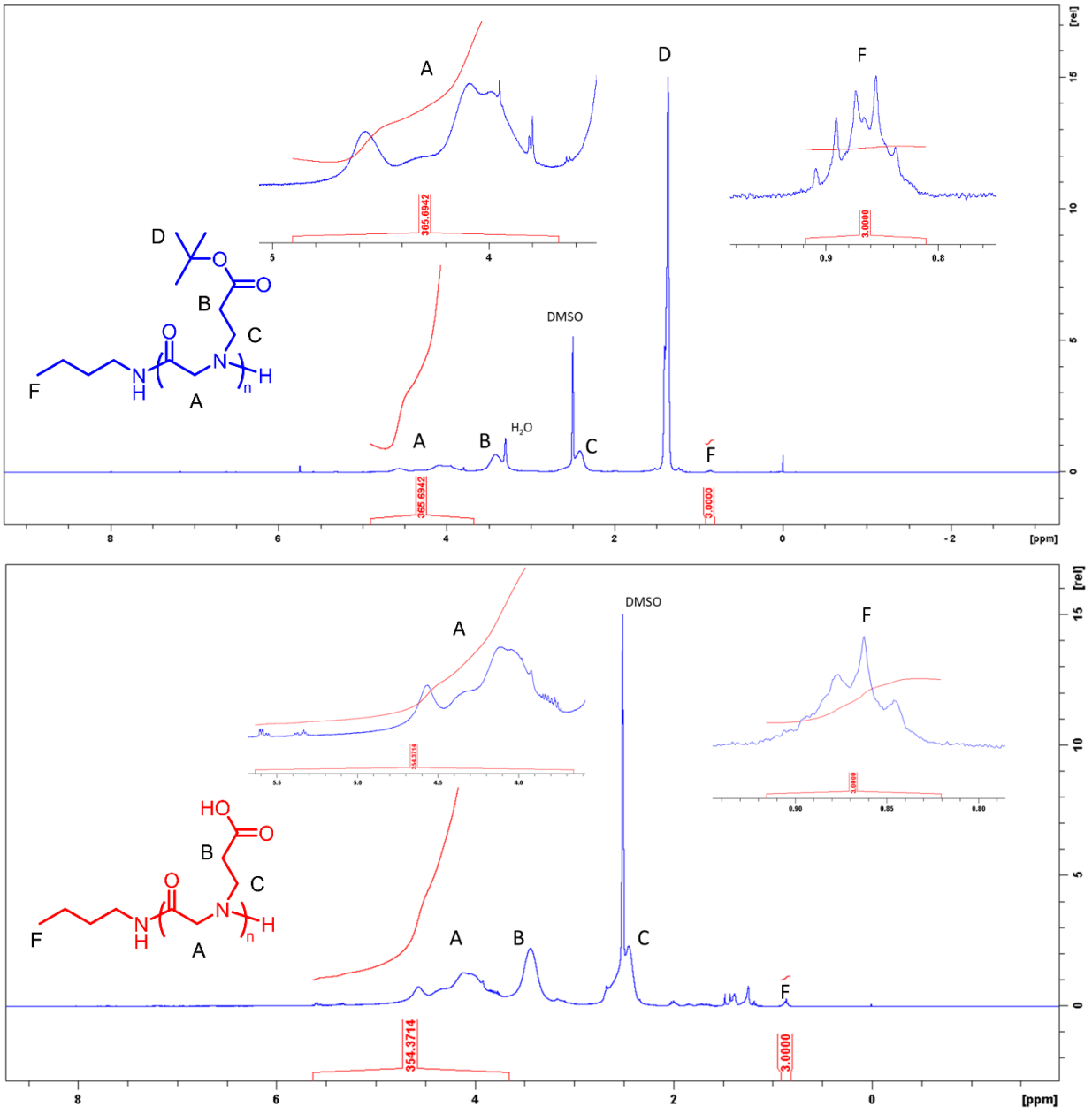

Figure S9. ^{1}H NMR spectra of poly(*N*-(3-*tert*-butoxy-3-oxopropyl) glycine) polymer precursor (top) and resulting poly(*N*-(2-carboxyethyl) glycine) (bottom) obtained after TFA treatment, in DMSO-d_6.

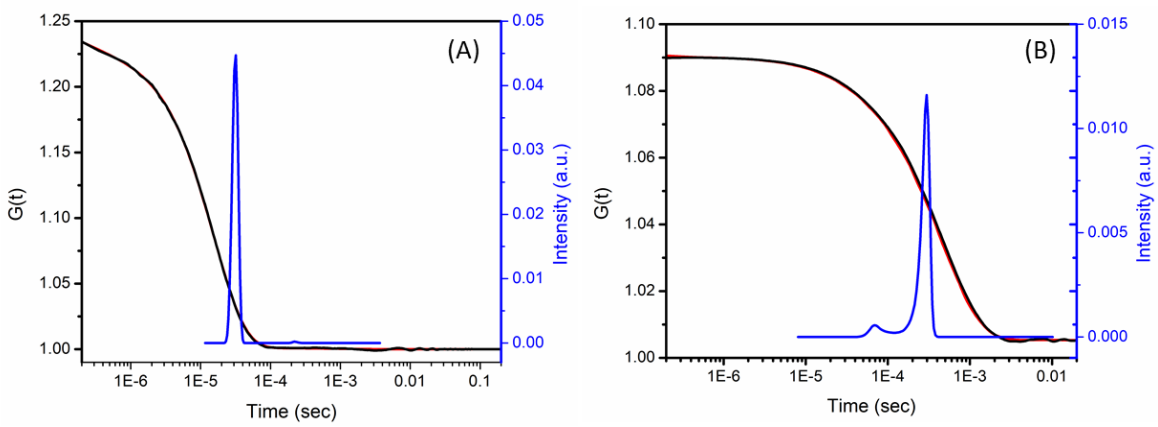

Figure S10. DLS correlograms (black curve) and intensity-weighted decay time distribution of poly(*N*-(2-carboxyethyl) glycine) (blue curve) in aqueous solution at two different pH (= 2.35 (A) and 11.8 (B)). DLS correlograms were fitted by MEM method (red curve) to determine the R_h values.