Supporting Information

Facile, Efficient, and Safe Copper-Free Synthesis of Glycidyl Triazolyl Polymers

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1. ^{1}H and ^{13}C NMR spectra of alkynes

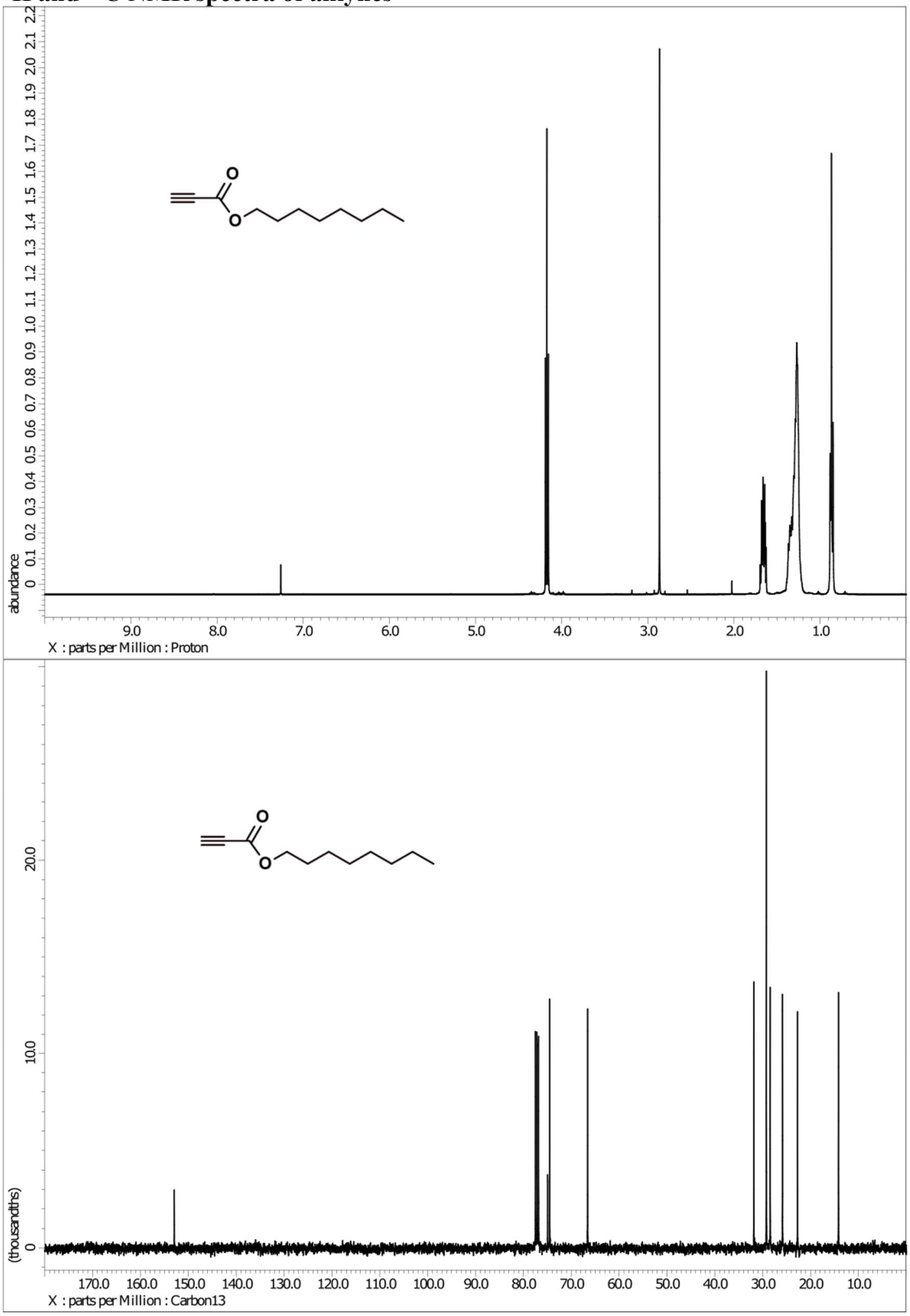

Figure S1. ^{1}H and ^{13}C NMR spectra of **Alkyne-C8** (Solvent: $CDCl_3$)

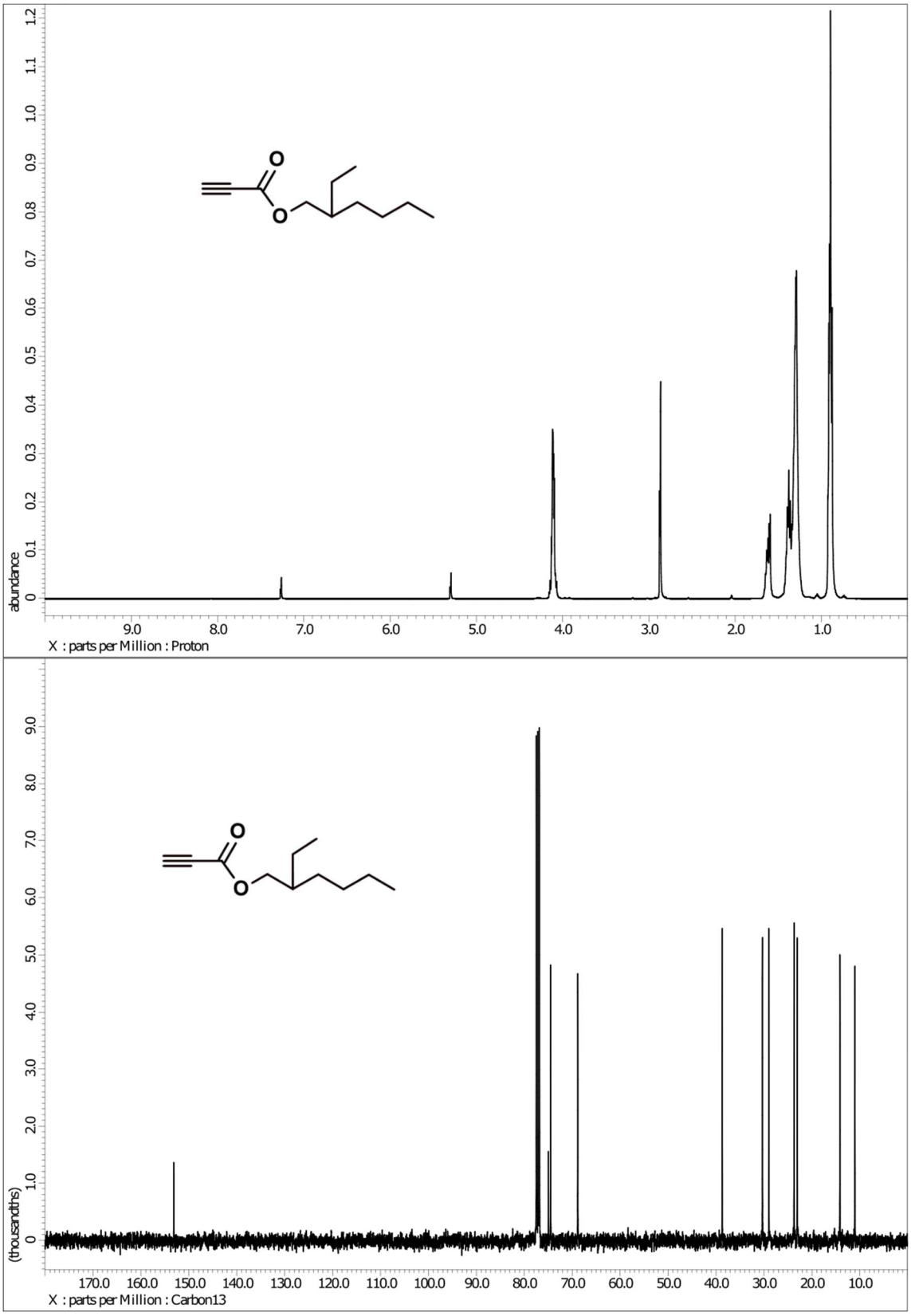

Figure S2. ^{1}H and ^{13}C NMR spectra of **Alkyne-2Et-C6** (Solvent: $CDCl_3$)

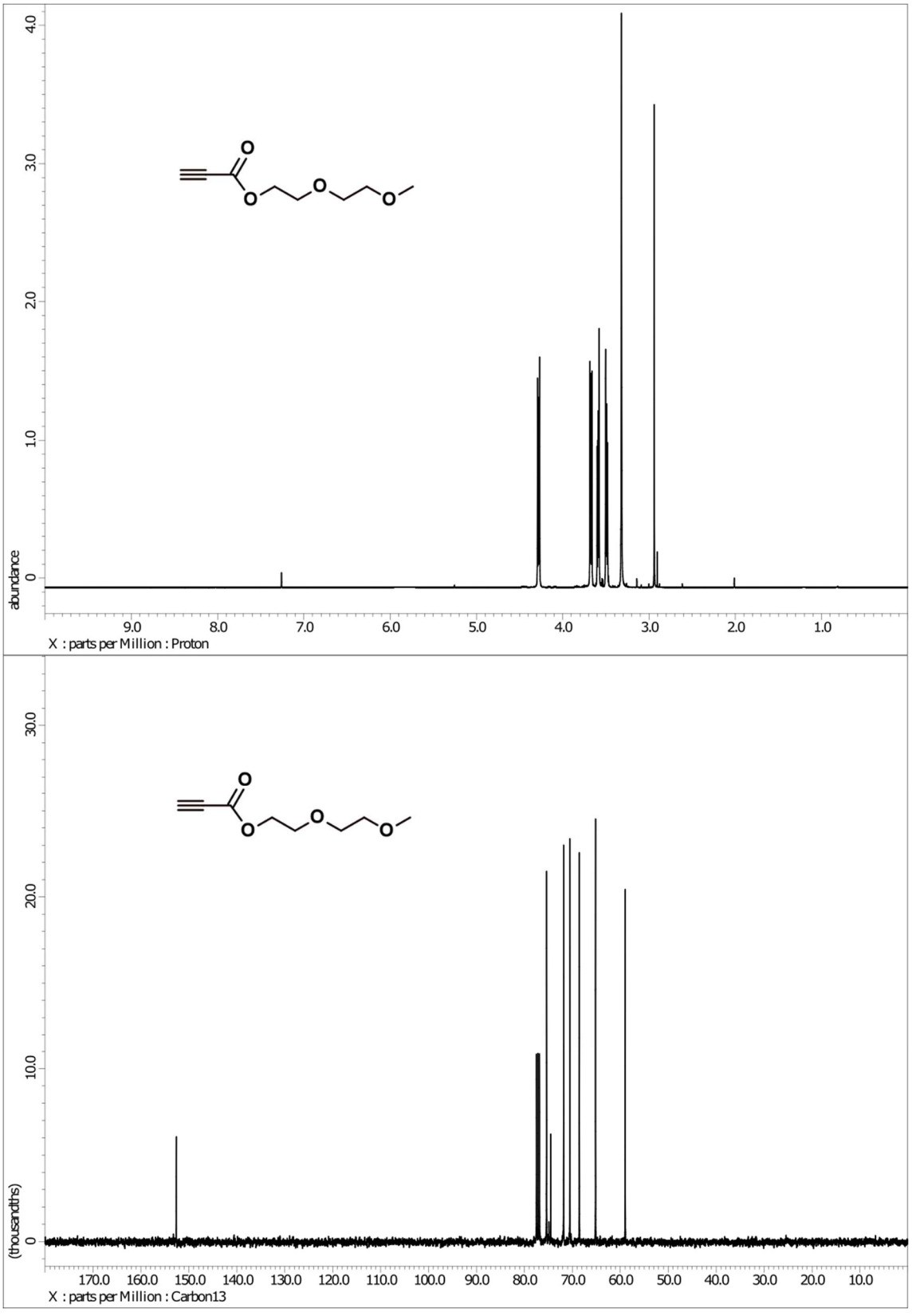

Figure S3. ^{1}H and ^{13}C NMR spectra of **Alkyne-EG2Me** (Solvent: $CDCl_3$)

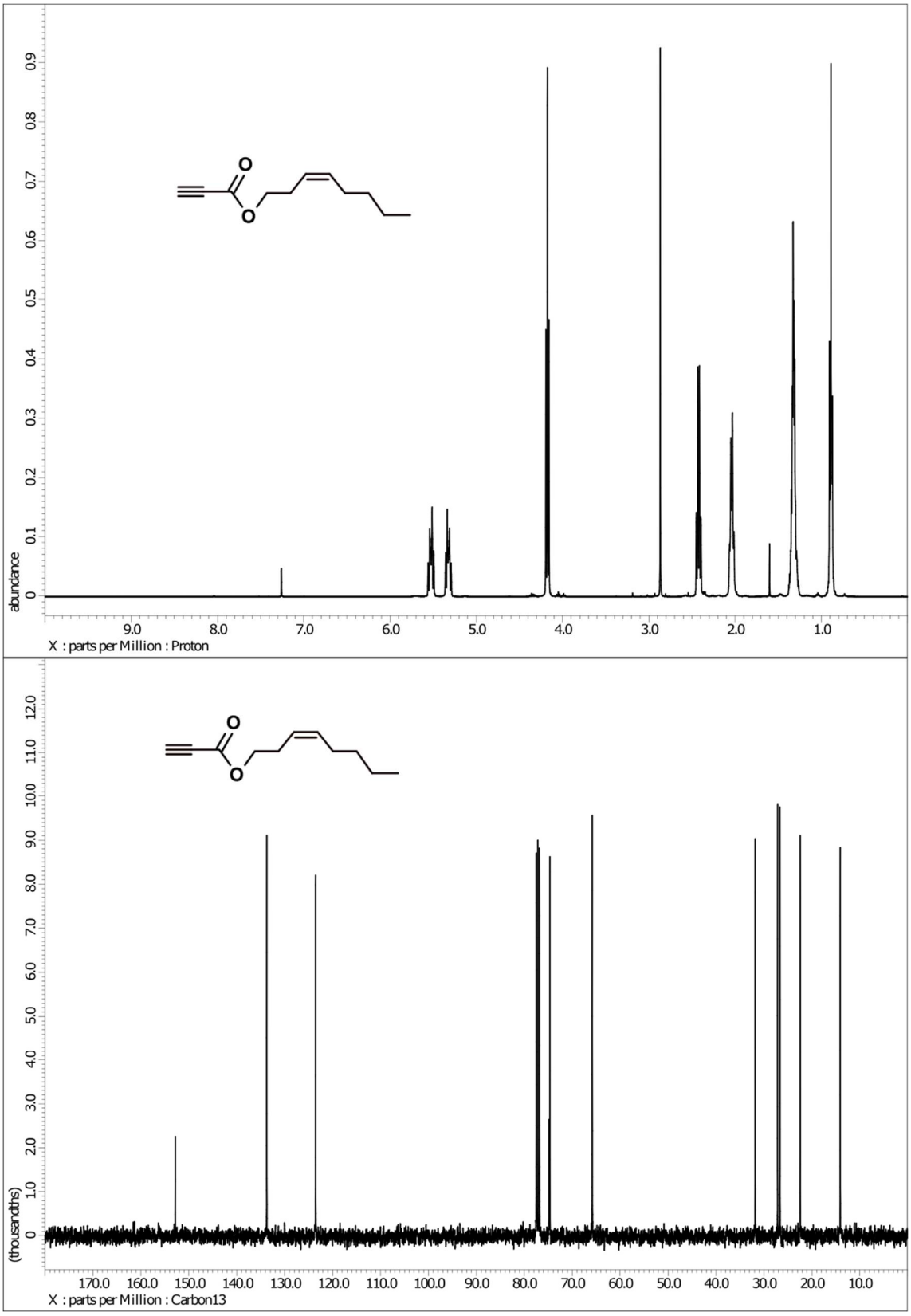

Figure S4. ^{1}H and ^{13}C NMR spectra of **Alkyne-*cis*3-C8** (Solvent: $CDCl_3$)

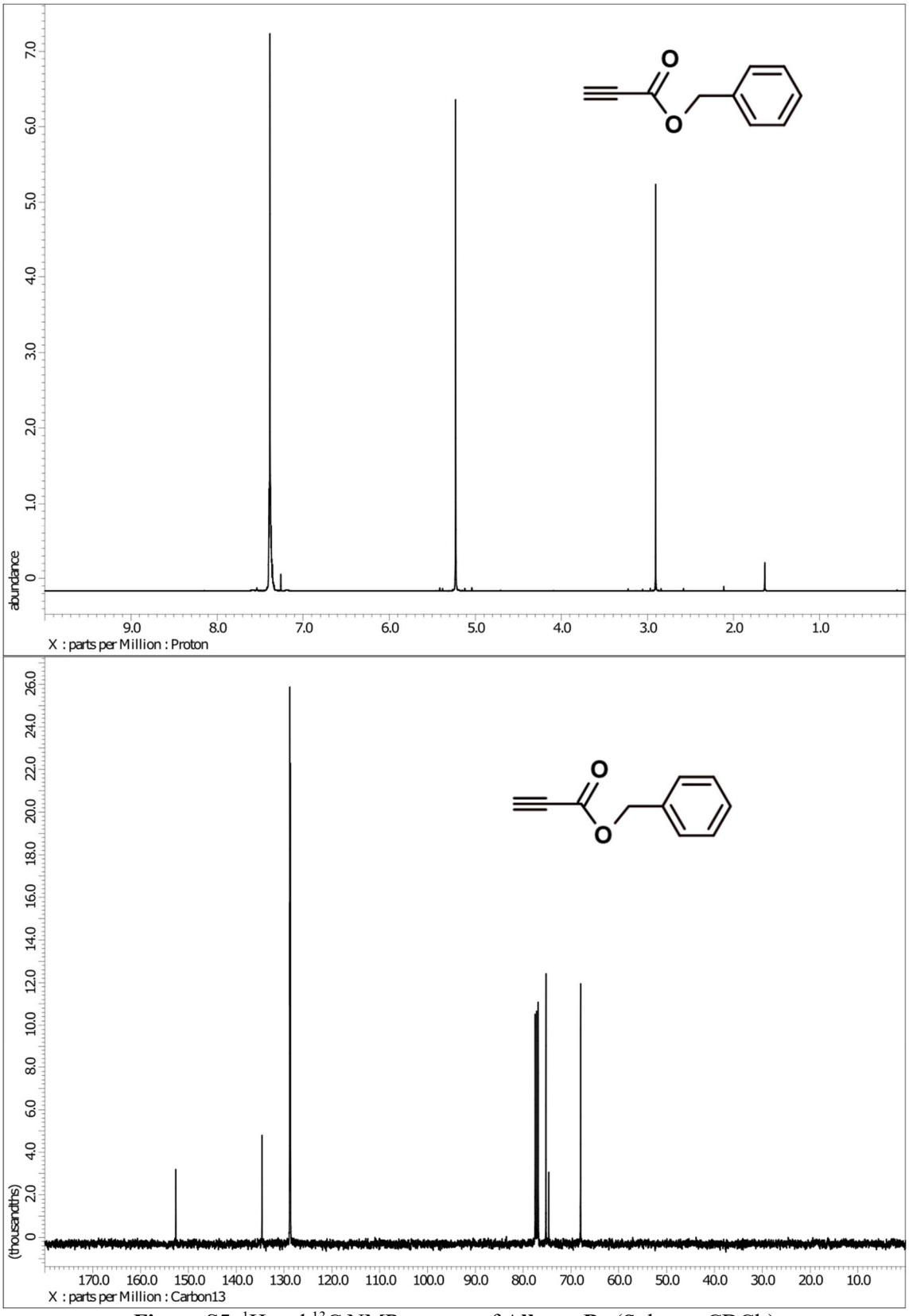

Figure S5. ^{1}H and ^{13}C NMR spectra of **Alkyne-Bz** (Solvent: $CDCl_3$)

2. ^{1}H and ^{13}C NMR spectra of GTPs

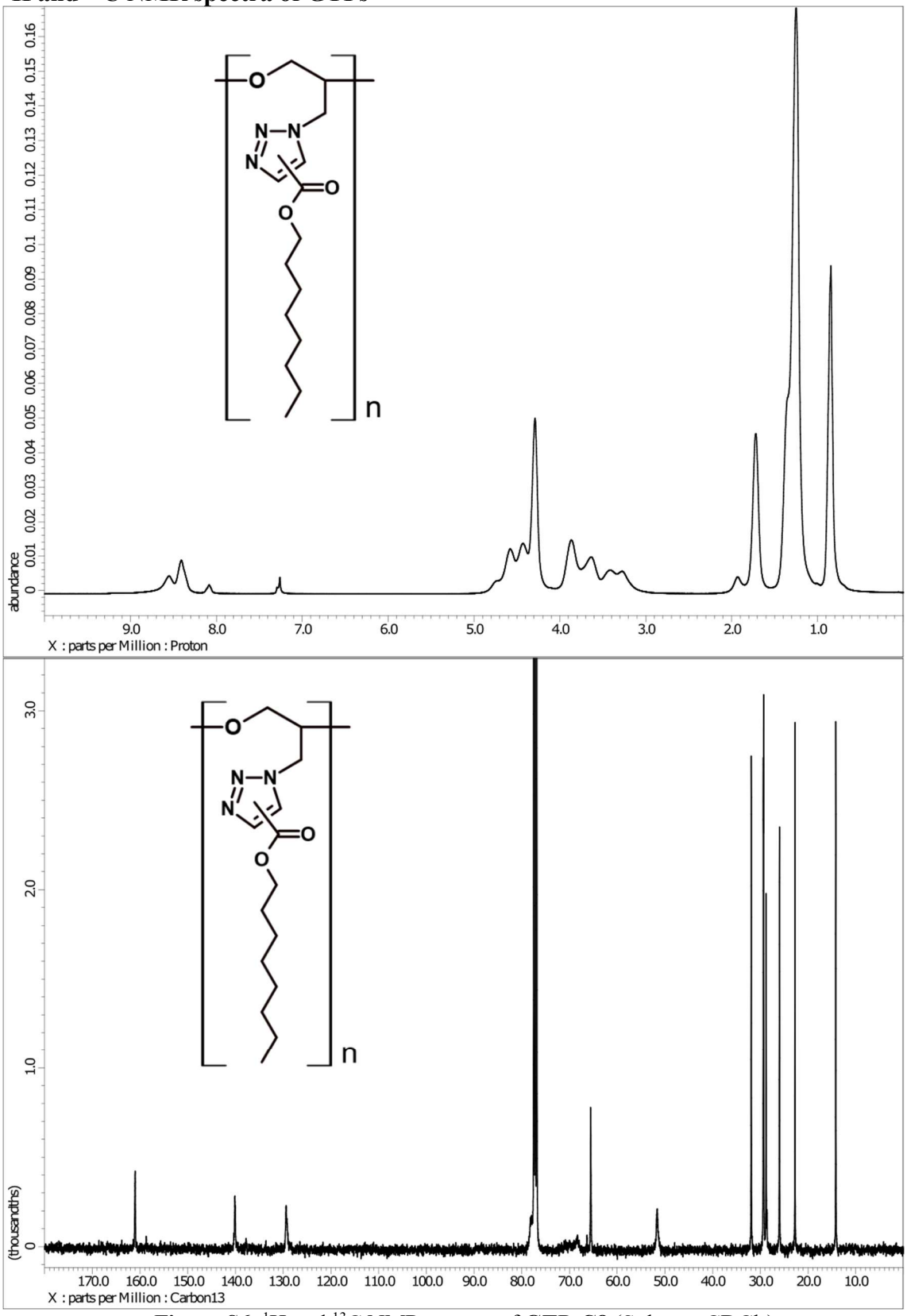

Figure S6. ^{1}H and ^{13}C NMR spectra of **GTP-C8** (Solvent: $CDCl_3$)

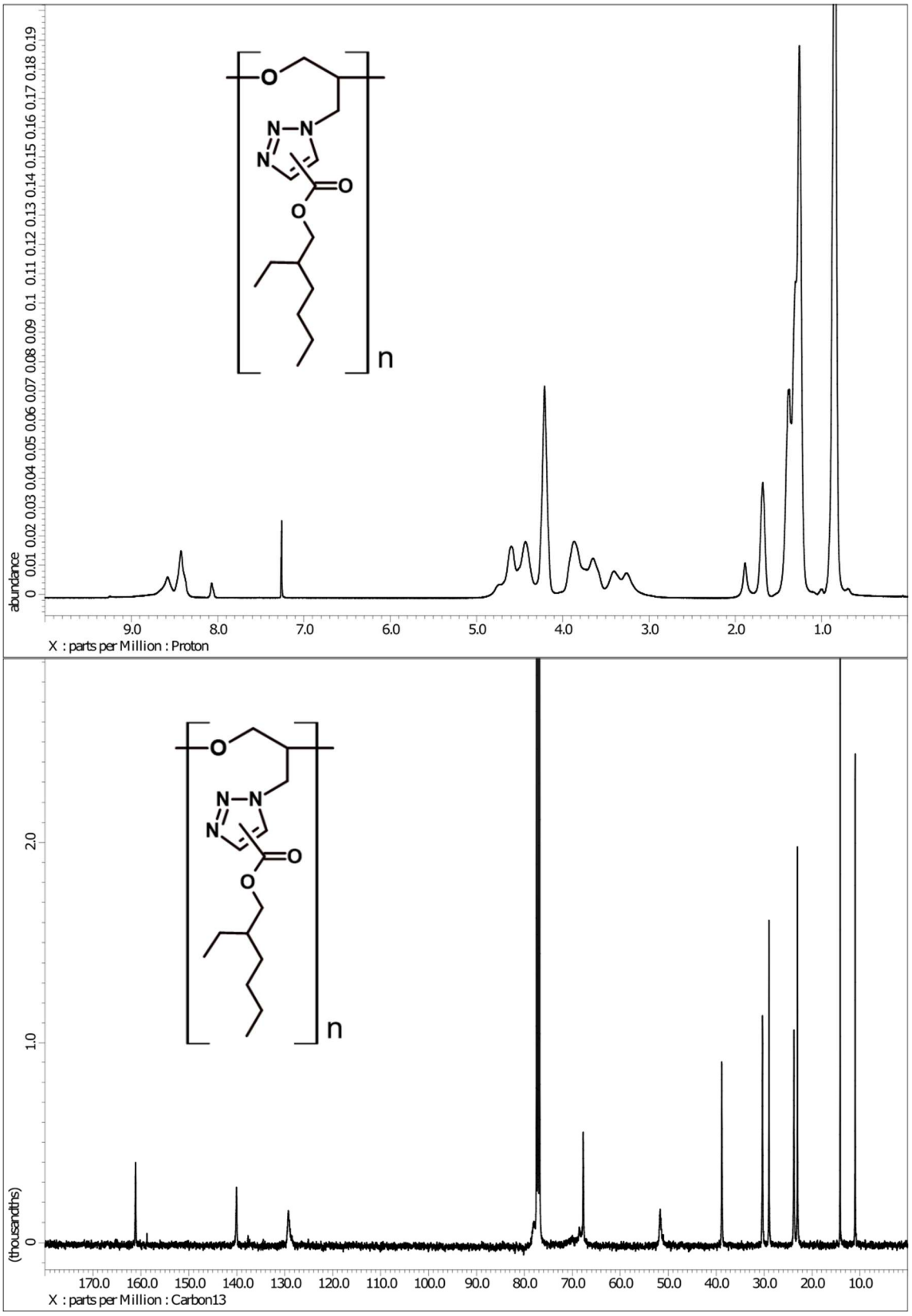

Figure S7. ^{1}H and ^{13}C NMR spectra of **GTP-2Et-C6** (Solvent: $CDCl_3$)

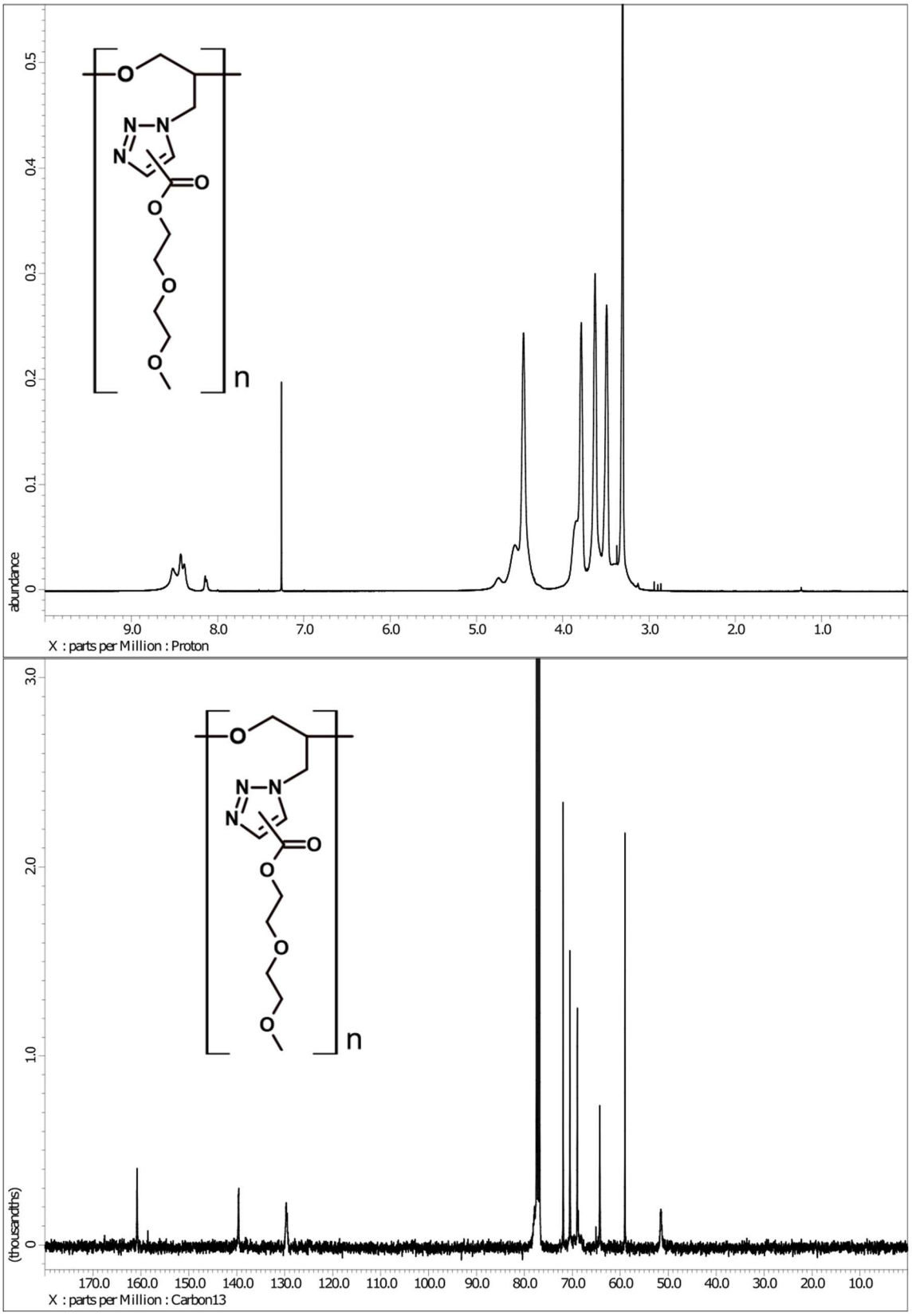

Figure S8. ^{1}H and ^{13}C NMR spectra of **GTP-EG2Me** (Solvent: $CDCl_3$)

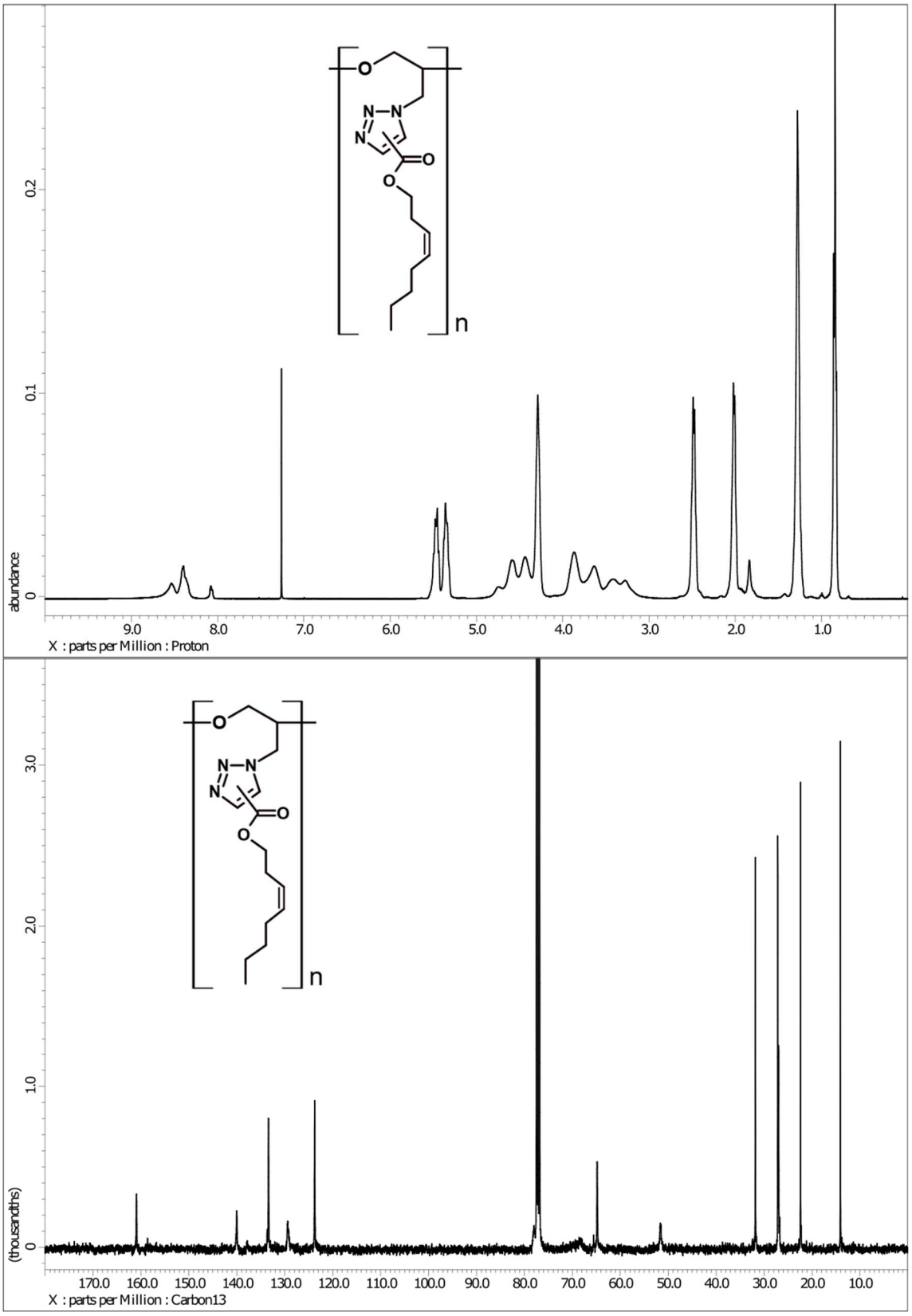

Figure S9. ^{1}H and ^{13}C NMR spectra of **GTP-*cis*3-C8** (Solvent: $CDCl_3$)

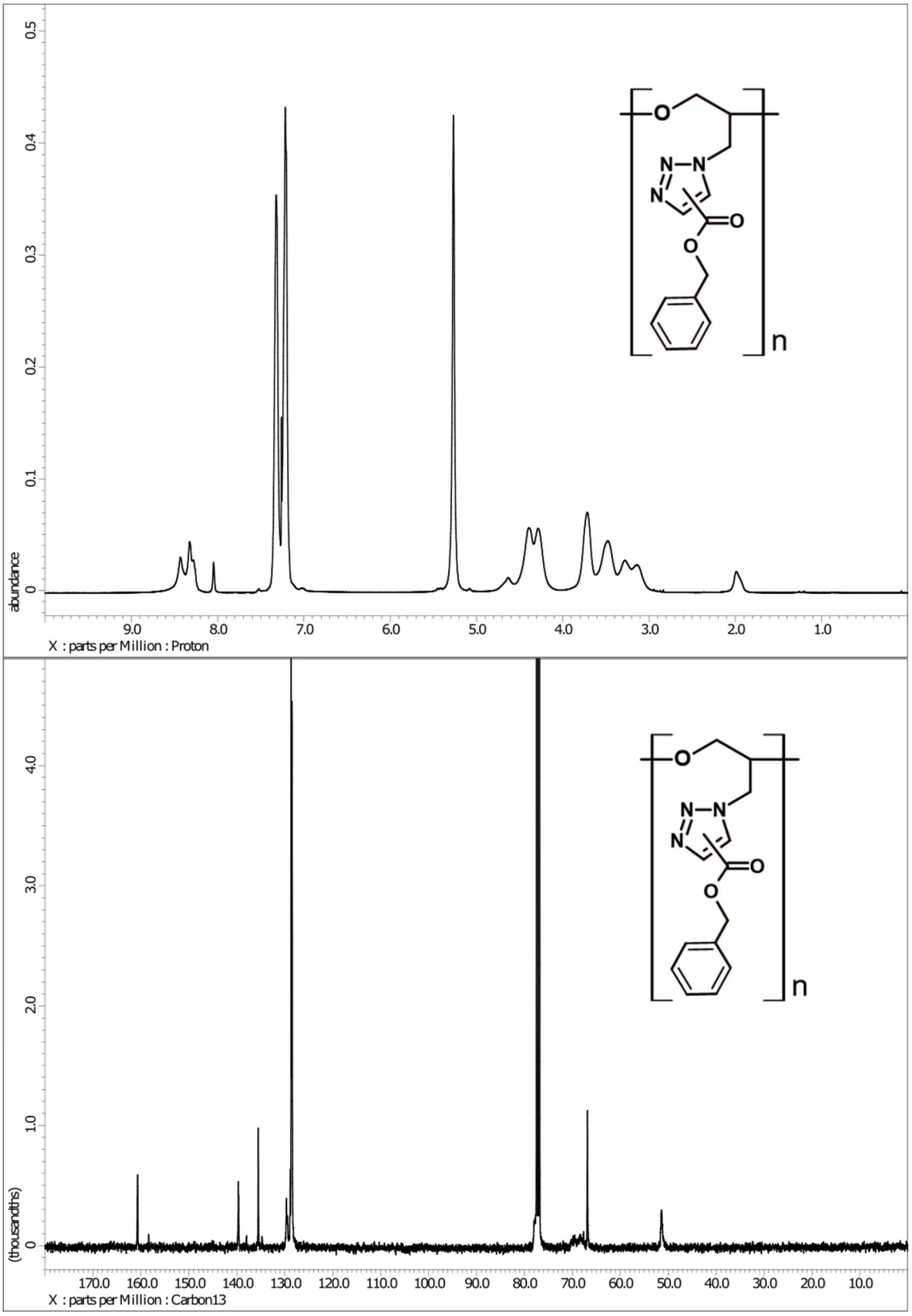

Figure S10. ^{1}H and ^{13}C NMR spectra of **GTP-Bz** (Solvent: $CDCl_3$)

3. Efficiency of desalination in work-up process

PECH (1.0 g, 0.011 mol repeating unit) was suspended in dry DMF (20 mL) in a 200 mL two-neck round-bottom flask with a condenser. After 10 min of N_2 bubbling, NaN_3 (1.0 g, 0.015 mol) was added to the solution at room temperature. The mixture was stirred at 90 °C under N_2 flow for 24 h. The reaction solution was cooled to room temperature.

Conventional work-up process: The reaction solution was added dropwise to distilled water (200 mL) with stirring. GAP was precipitated as white rubber-like material. The supernatant of the aqueous solution was translucent because some GAP did not precipitate. The remaining reaction solution in a reaction flask was also washed with distilled water. The recovered GAP sample was washed again with distilled water. All aqueous solutions used for precipitation and washing GAP were collected in a separation funnel. After the partition with ethyl acetate, the aqueous layer turned from translucent to transparent because unprecipitated GAP sample in aqueous layer was dissolved in ethyl acetate. The aqueous layer was recovered and the solvent was removed with an evaporator. The recovered salts were dried overnight at 60 °C under vacuum.

New work-up process: The work-up process is the same as those described in the main text. After the partition, the aqueous layer was recovered and the solvent was removed with an evaporator. The recovered salts were dried overnight at 60 °C under vacuum.

Table S1. Weight of recovered salt*

Run No.	Conventional work-up process [g]	New work-up process [g]
1	0.853	0.922
2	0.775	0.921
3	0.831	0.925
Average	0.82	0.92
standard error	0.02	0.00

* Theoretically, maximum recovery weight of salts is 0.93 g.

4. 2D COSY, HMQC spectra and peak integral of ^{1}H NMR of GTP-*cis*3-C8

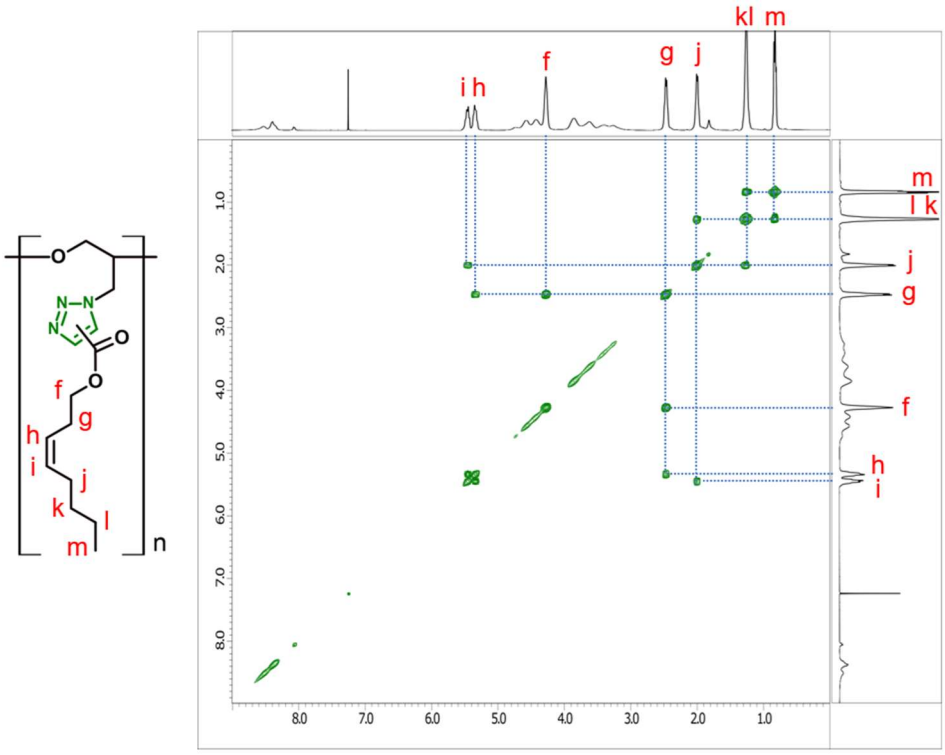

Figure S11. ^{1}H-^{1}H COSY spectrum of GTP-*cis*3-C8 (Solvent: $CDCl_3$). Assignments of side chain peaks were depicted.

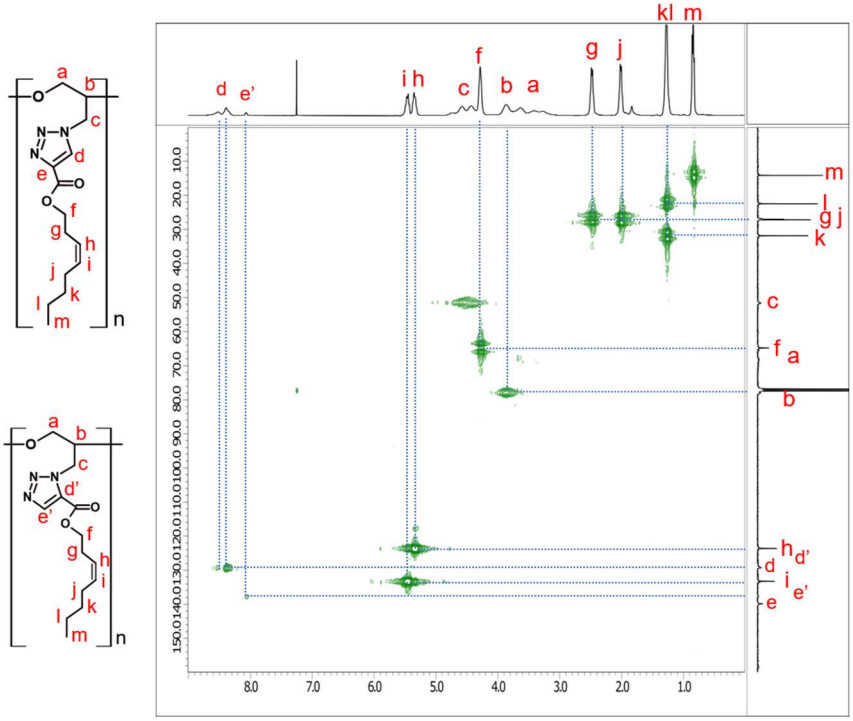

Figure S12. ^{1}H-^{13}C HMQC spectrum of GTP-*cis*3-C8 (Solvent: $CDCl_3$). Assignments of side chain peaks were depicted.

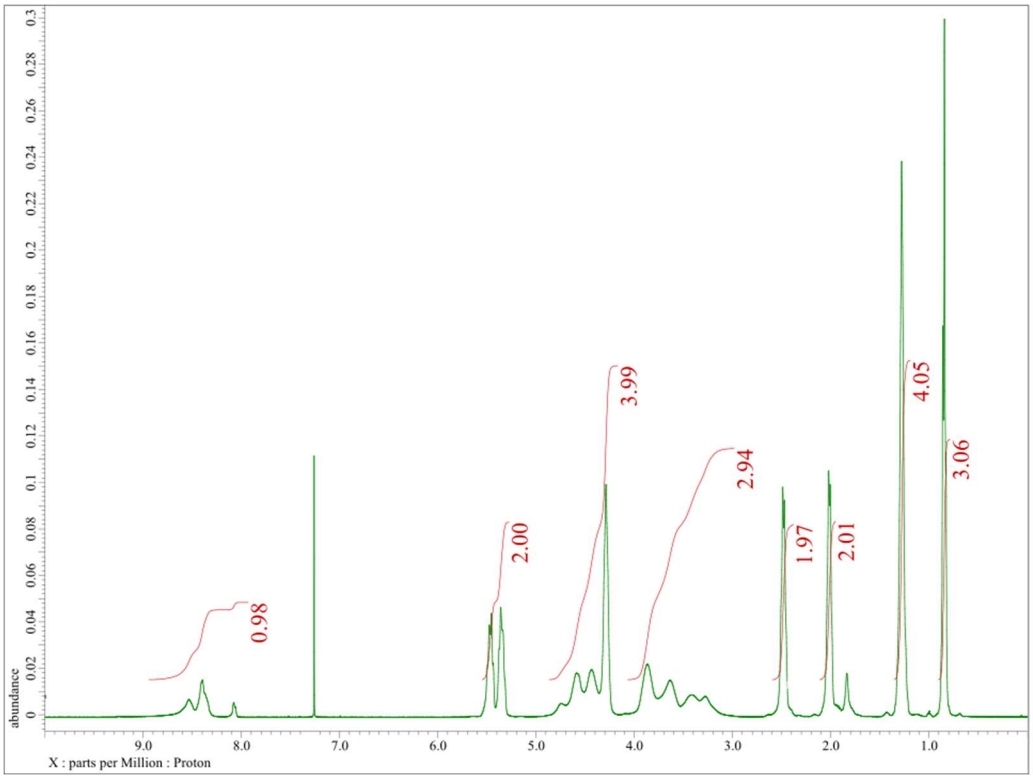

Figure S13. ^{1}H-NMR spectrum of GTP-*cis*3-C8 with integral values (Solvent: $CDCl_3$).

5. IR spectra of GAP and GTPs

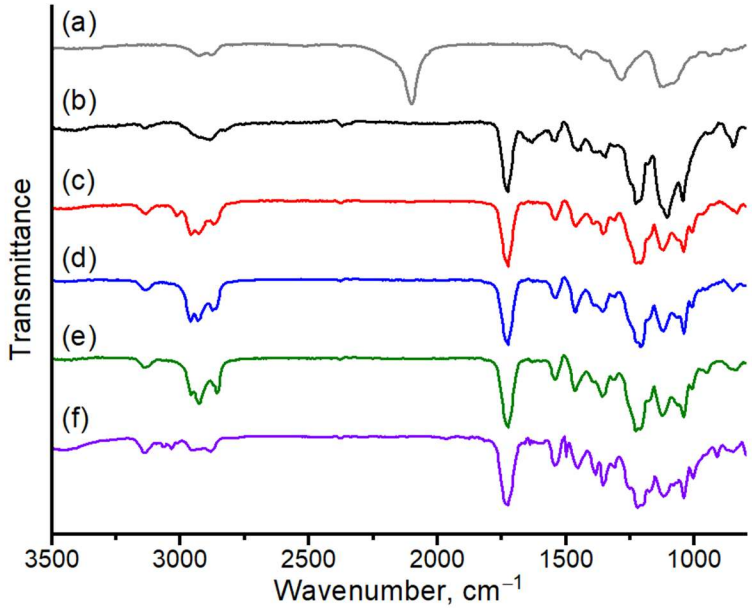

Figure S14. IR spectra of (a) GAP, (b) GTP-EG2Me, (c) GTP-*cis*3-C8, (d) GTP-2Et-C6, (e) GTP-C8, (f) GTP-Bz. KBr pellets.

6. DSC measurements

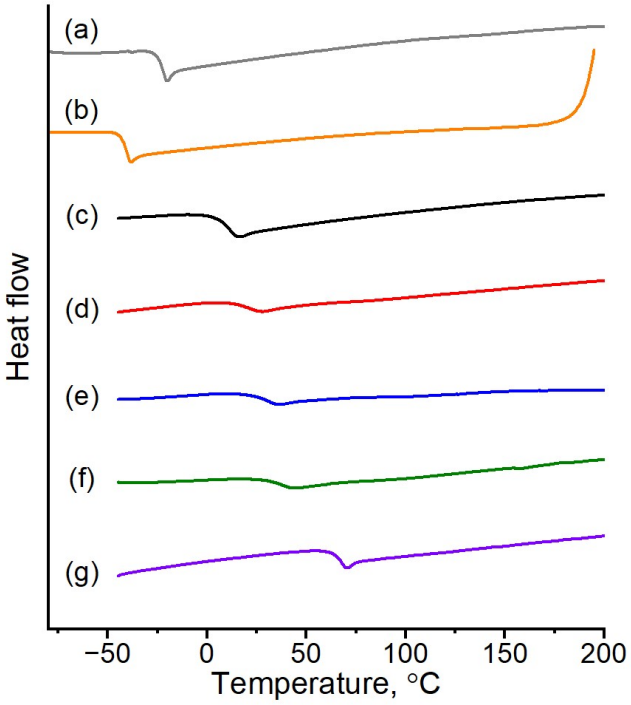

Figure S15. DSC charts of PECH, GAP and GTPs. Third heating scan. Scan rate: 10 °C min^{-1}. (a) PECH. (b) GAP. (c) GTP-EG2Me. (d) GTP-*cis*3-C8. (e) GTP-2Et-C6. (f) GTP-C8. (e) GTP-Bz.

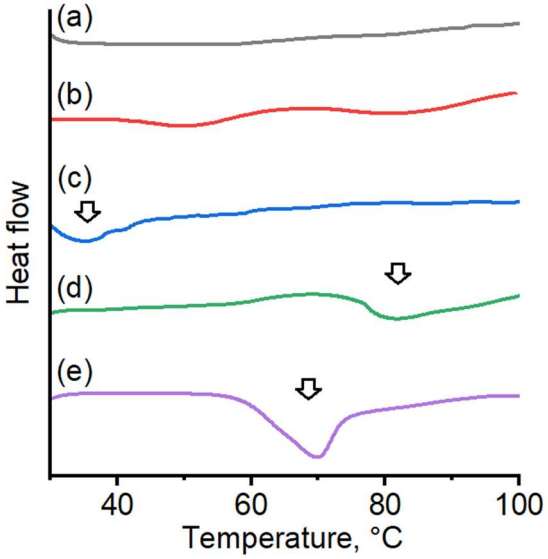

Figure S16. DSC charts of GTPs. First heating scan. Heating rate: 10 ºC min^{-1}. (a) GTP-EG2Me. (b) GTP-*cis*3-C8. (c) GTP-2Et-C6. (d) GTP-C8. (e) GTP-Bz.

7. TGA measurements

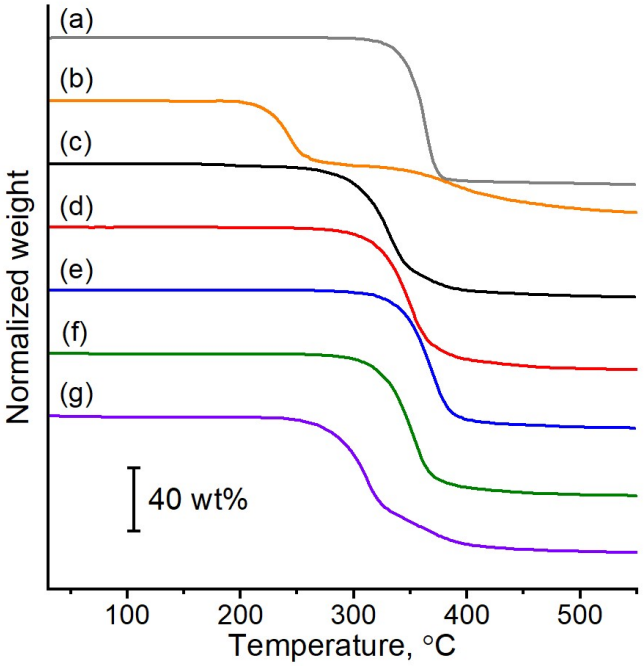

Figure S17. TGA charts of PECH, GAP and GTPs. (a) PECH. (b) GAP. (c) GTP-EG2Me. (d) GTP-*cis*3-C8. (e) GTP-2Et-C6. (f) GTP-C8. (g) GTP-Bz.

8. Mechanical property of PECH

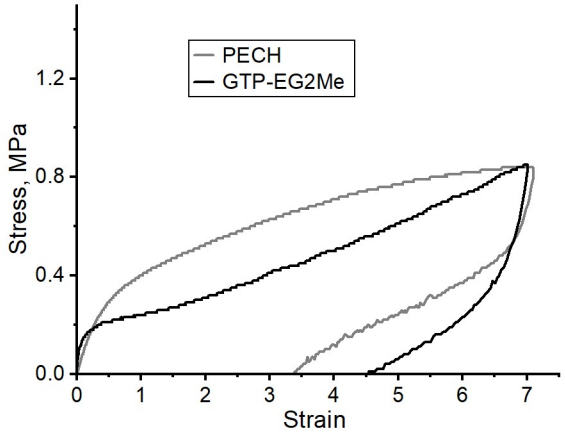

Figure S18. Stress–strain curve of PECH and GTP-EG2Me. Stretch rate: 10 mm min^{-1}. Temperature: room temperature (16–17 °C).

9. Contact angle measurements

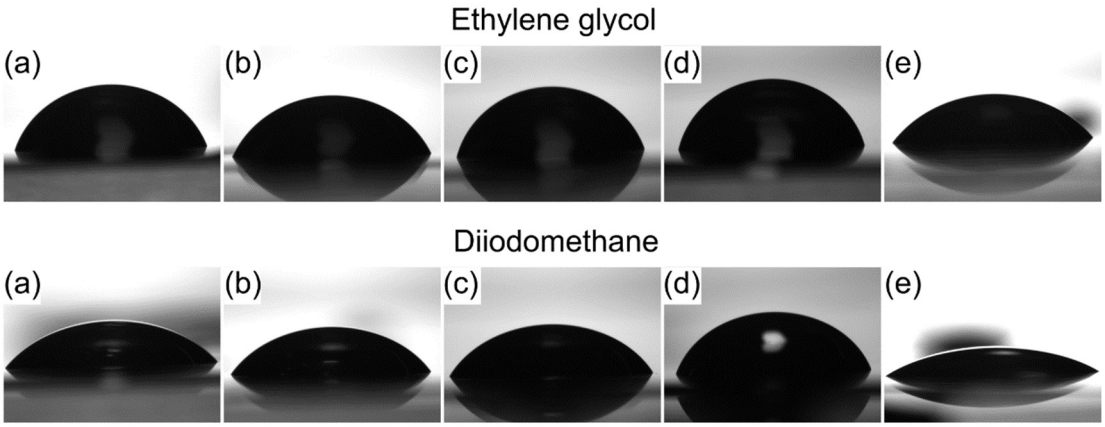

Figure S19. Contact angles measured on (a) GTP-EG2Me, (b) GTP-*cis*3-C8, (c) GTP-2Et-C6, (d) GTP-C8 and (e) GTP-Bz films with ethylene glycol droplets (top row) and diiodomethane droplets (bottom row).