Supplementary Materials

Sustainable Network Polyurethanes Using Carbon Dioxide and Biomass-Derived Alcohols as Thermal Interface Materials

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Table of Contents

Table S1. The diffusivity, density, specific heat, and thermal conductivity of CPU-Ag composites.

Name	α^{a} (mm^2/s)	ρ^{b} (g/cm^3)	C_p^{c} (J/g.K)	κ^{d} (W/m.K)
CPU1-Ag	26.522	4.654	0.414	51.1
CPU2-Ag	10.382	4.216	0.546	23.9
CPU3-Ag	5.948	4.187	0.534	13.3

[a]Thermal diffusivity of composites was measured by LFA (LFA467). [b]Density was measured in 25 ˚C. [c]Specific heat capacity was measured by specific heat DSC in 25 ˚C. [d]Thermal conductivity of composites was calculated by using the equation: $\kappa = \alpha \times \rho \times C_p$

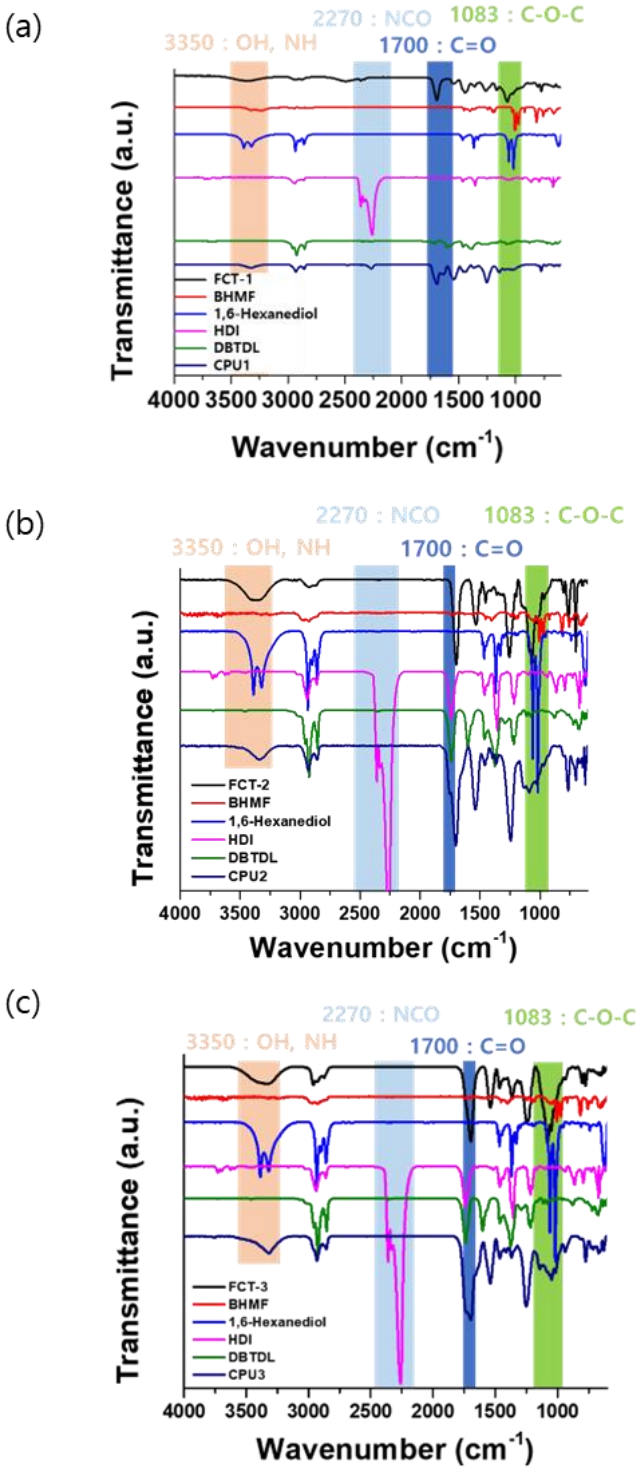


Figure S1. (FT-IR spectra of CPU1~3 and starting materials

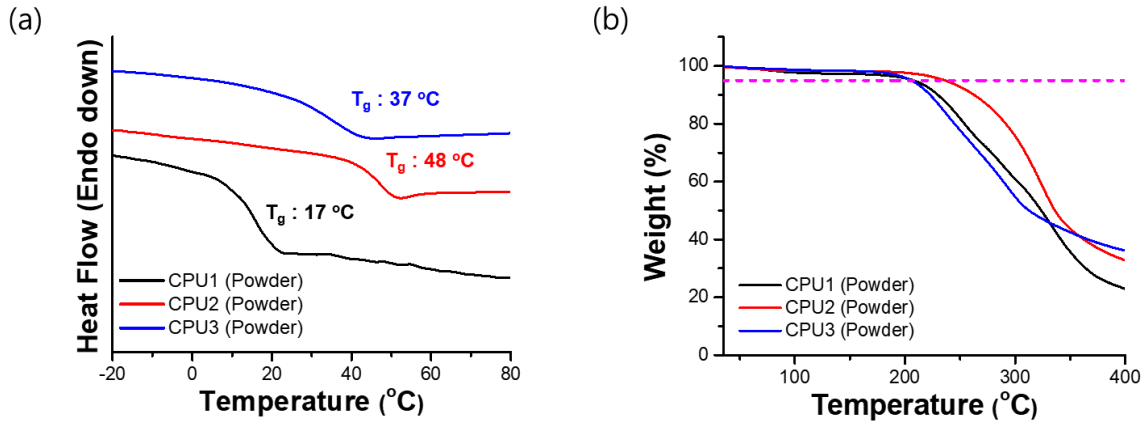


Figure S2. DSC and TGA curves of CPU1~3 powder

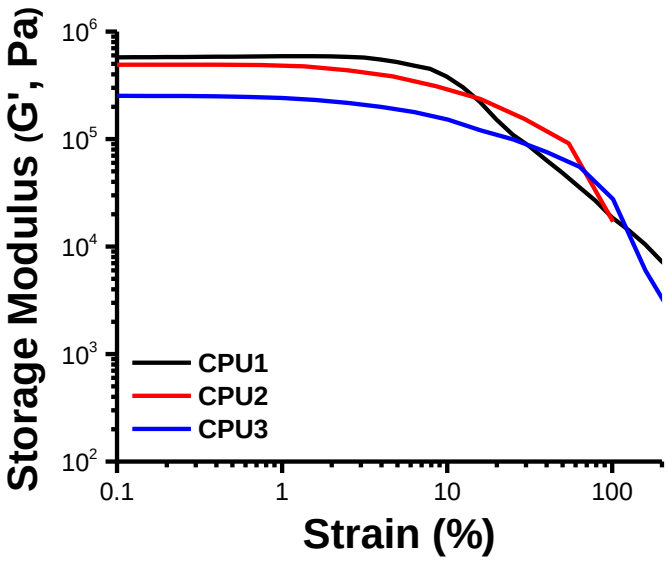


Figure S3. Storage modulus in the strain sweep of CPU1~3 at 180 °C.

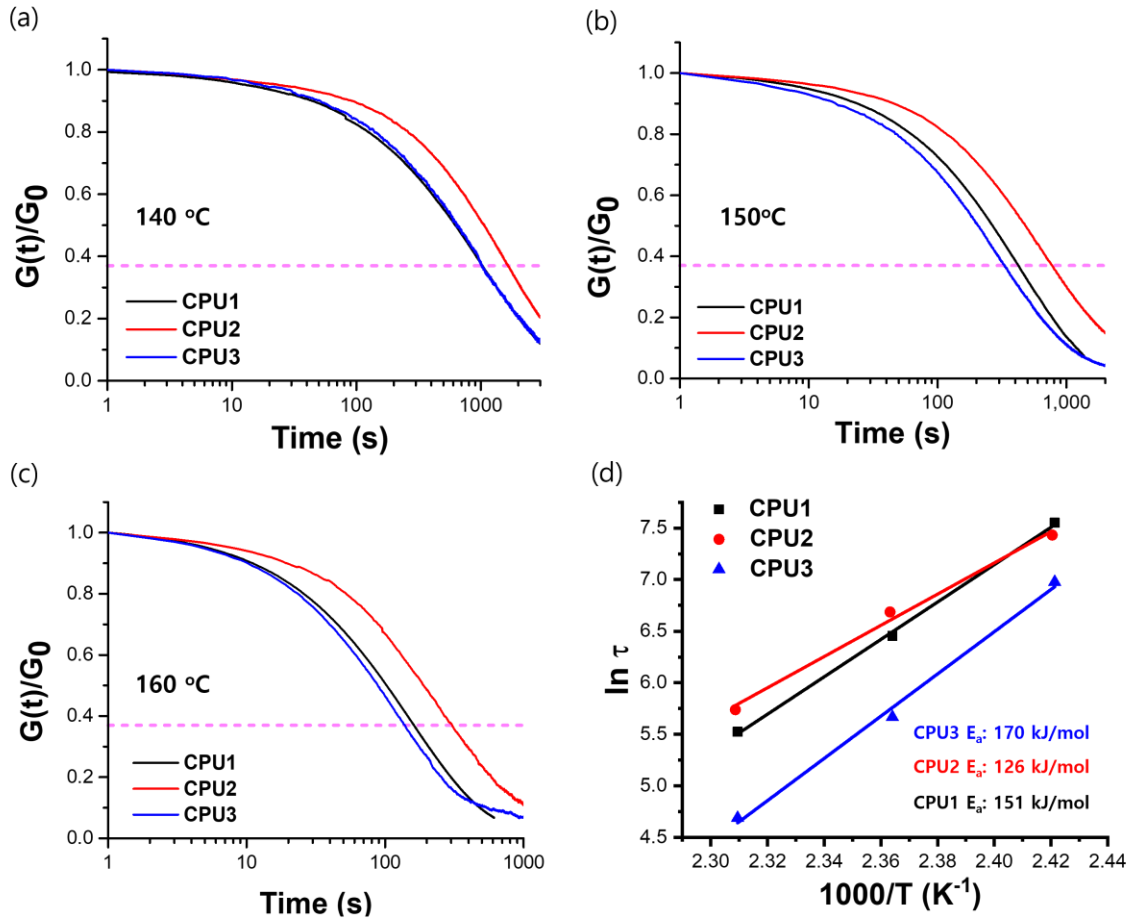


Figure S4. Comparison of stress relaxation analysis of CPU1, CPU2, and CPU3 at (a) 140 °C, (b) 150 °C, (c) 160 °C (d) Arrhenius plot of the measured relaxation times for CPU1, CPU2, and CPU3

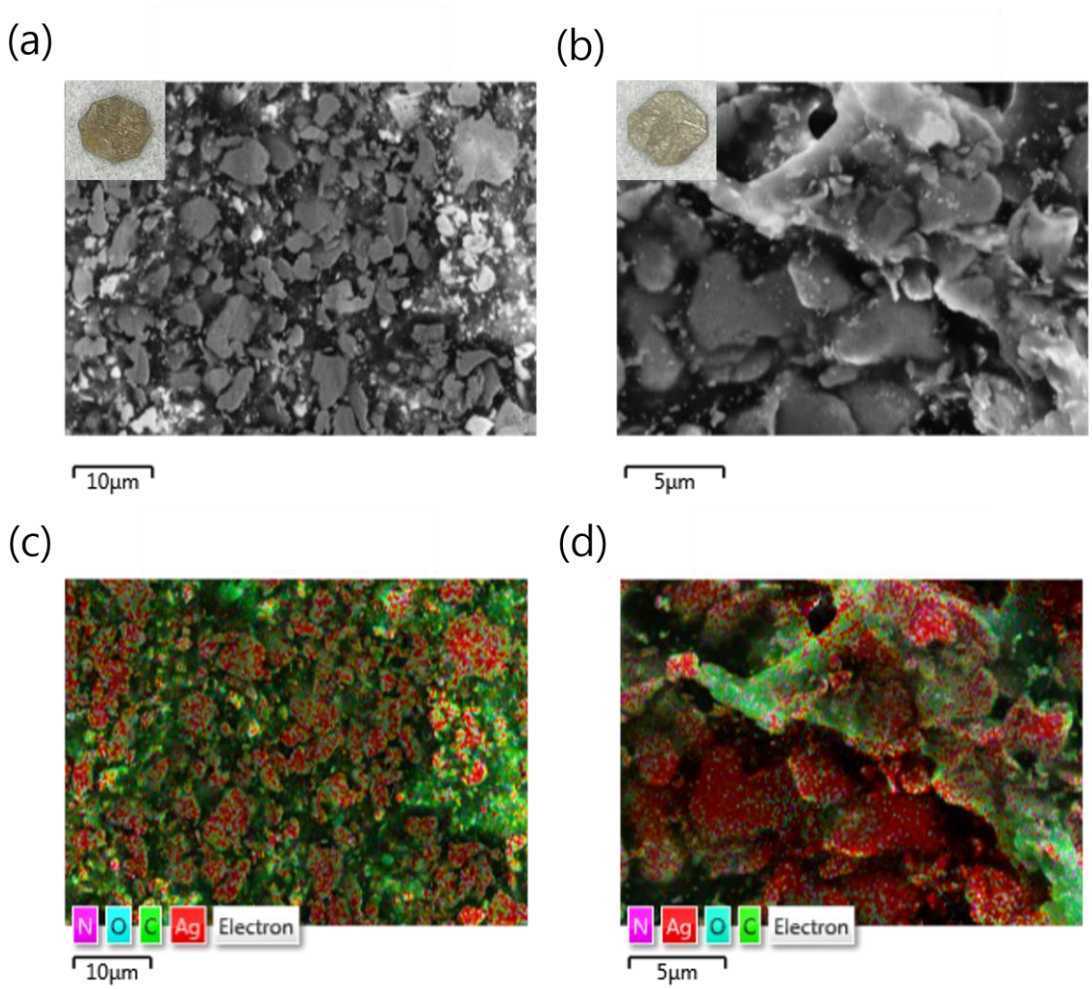


Figure S5. SEM images of CPU1-Ag (a) and CPU2-Ag (b). SEM-EDS mapping of CPU1-Ag (c) and CPU2-Ag (d)

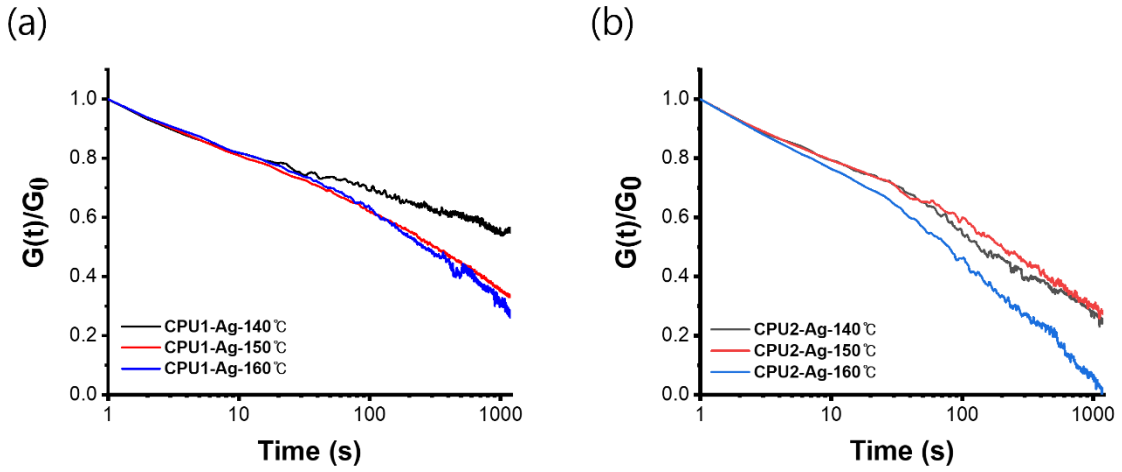


Figure S6. Stress relaxation analysis at 140 °C, 150 °C, 160 °C of CPU1-Ag (a) and CPU2-Ag (b).

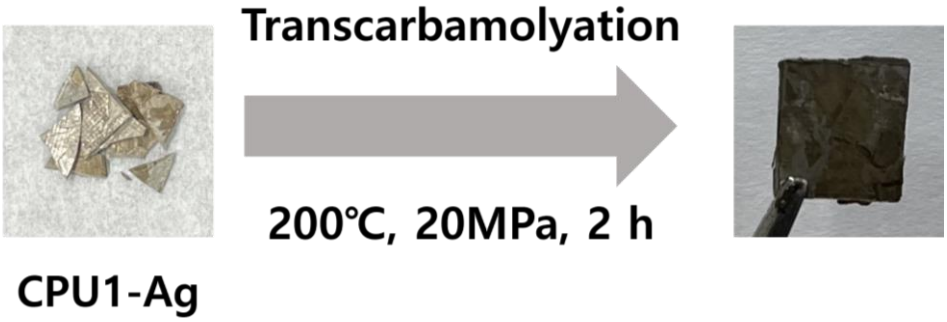


Figure S7. Malleability test of CPU1-Ag

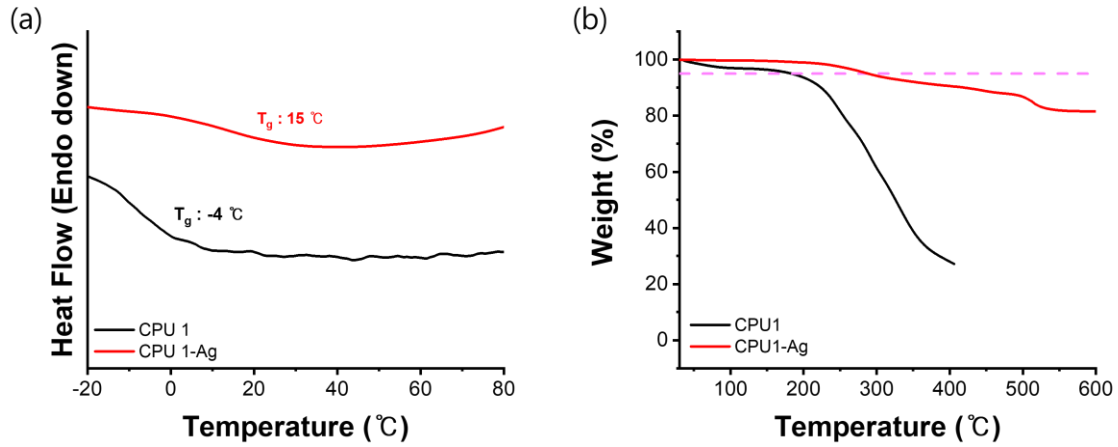
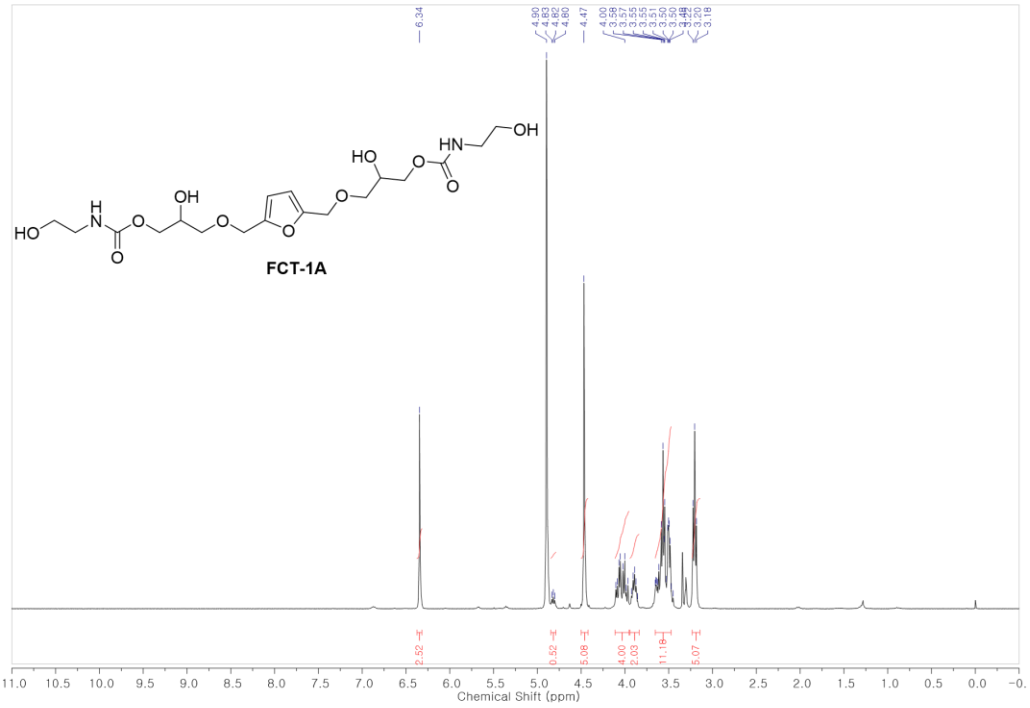


Figure S8. Comparisons of DSC (a) and TGA curves (b) of CPU1 and CPU1-Ag

(a)



(b)

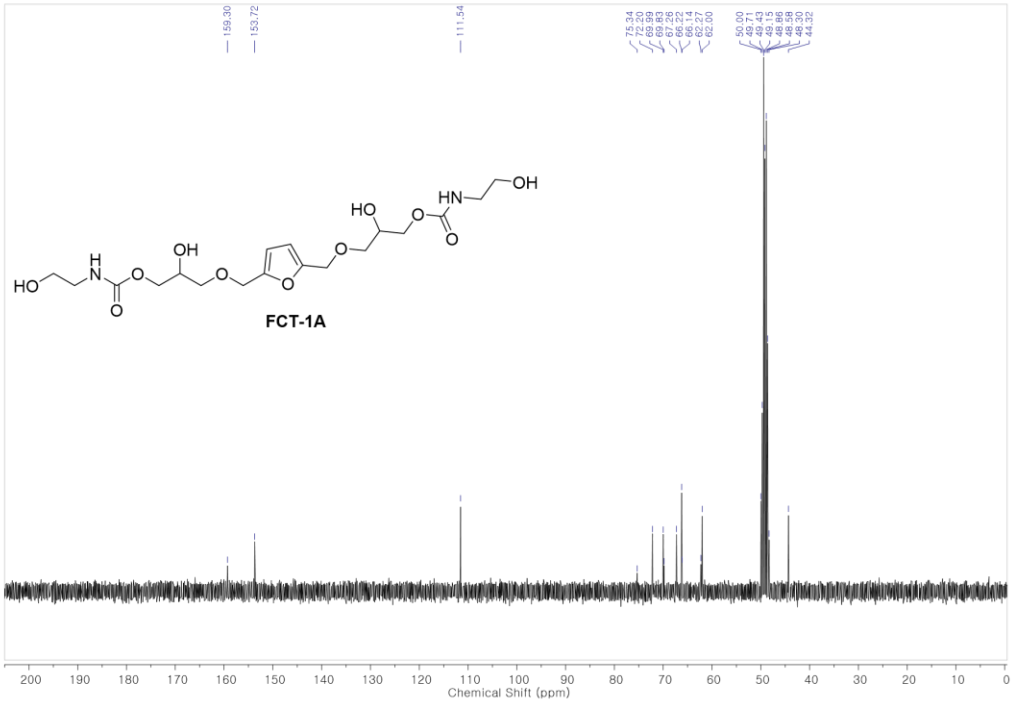


Figure S9. ^{1}H (300 MHz, CD_3OD) (a) and ^{13}C NMR spectra (85 MHz, CD_3OD) (b) of FCT-1.

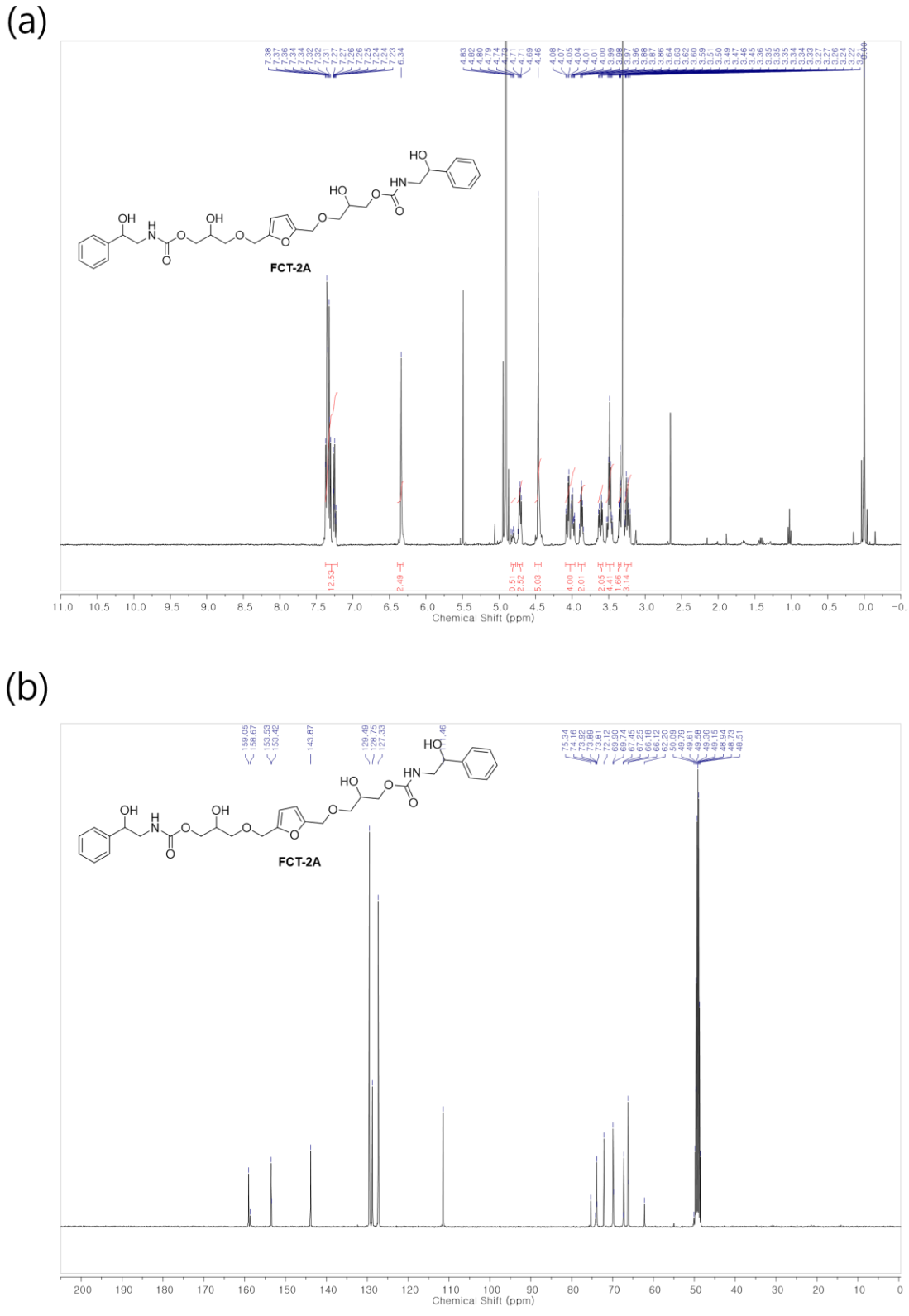
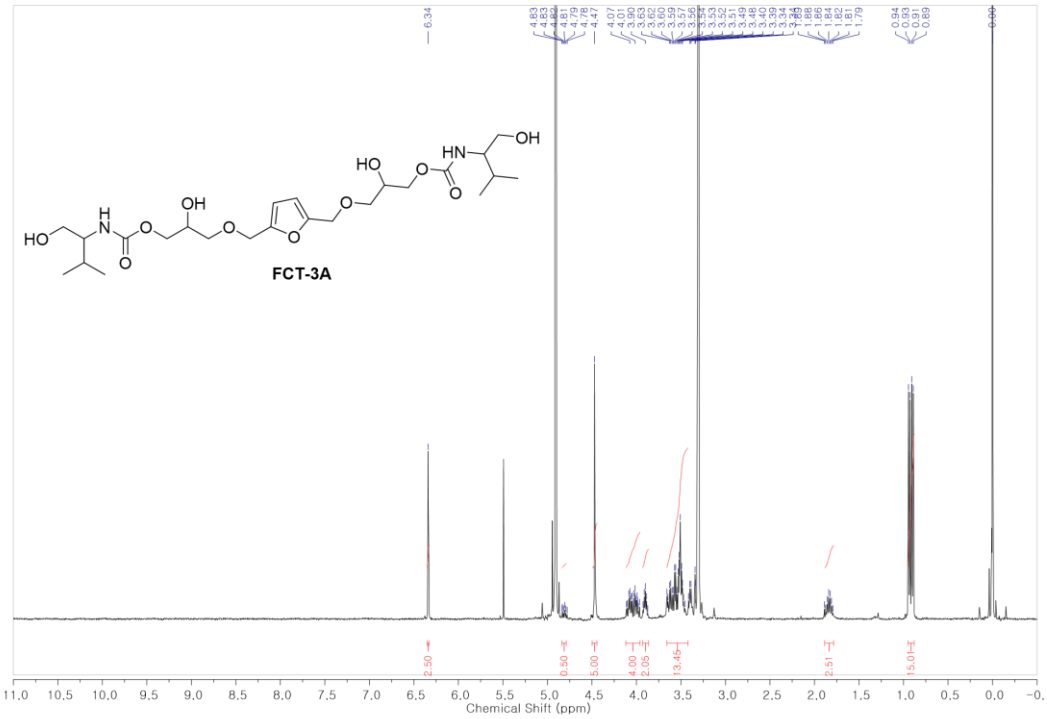


Figure S10. ^{1}H (300 MHz, CD_3OD) (a) and ^{13}C NMR spectra (85 MHz, CD_3OD) (b) of FCT-2.

(a)



(b)

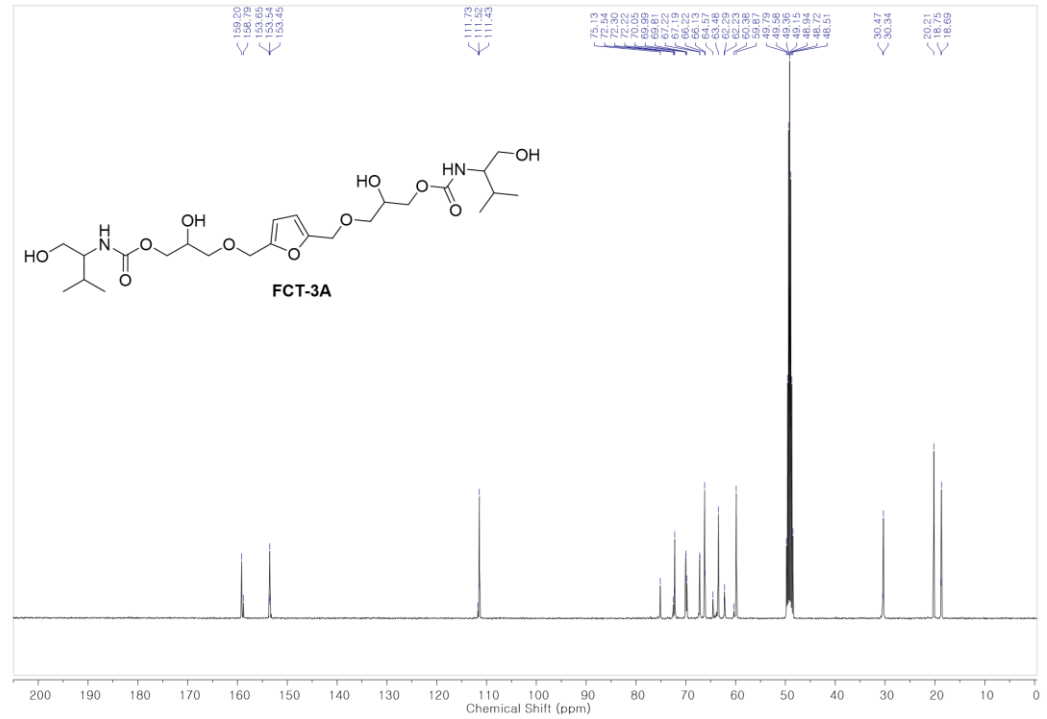


Figure S11. ^{1}H (300 MHz, CD_3OD) (a) and ^{13}C NMR spectra (85 MHz, CD_3OD) (b) of FCT-3.