

## Supplementary Material

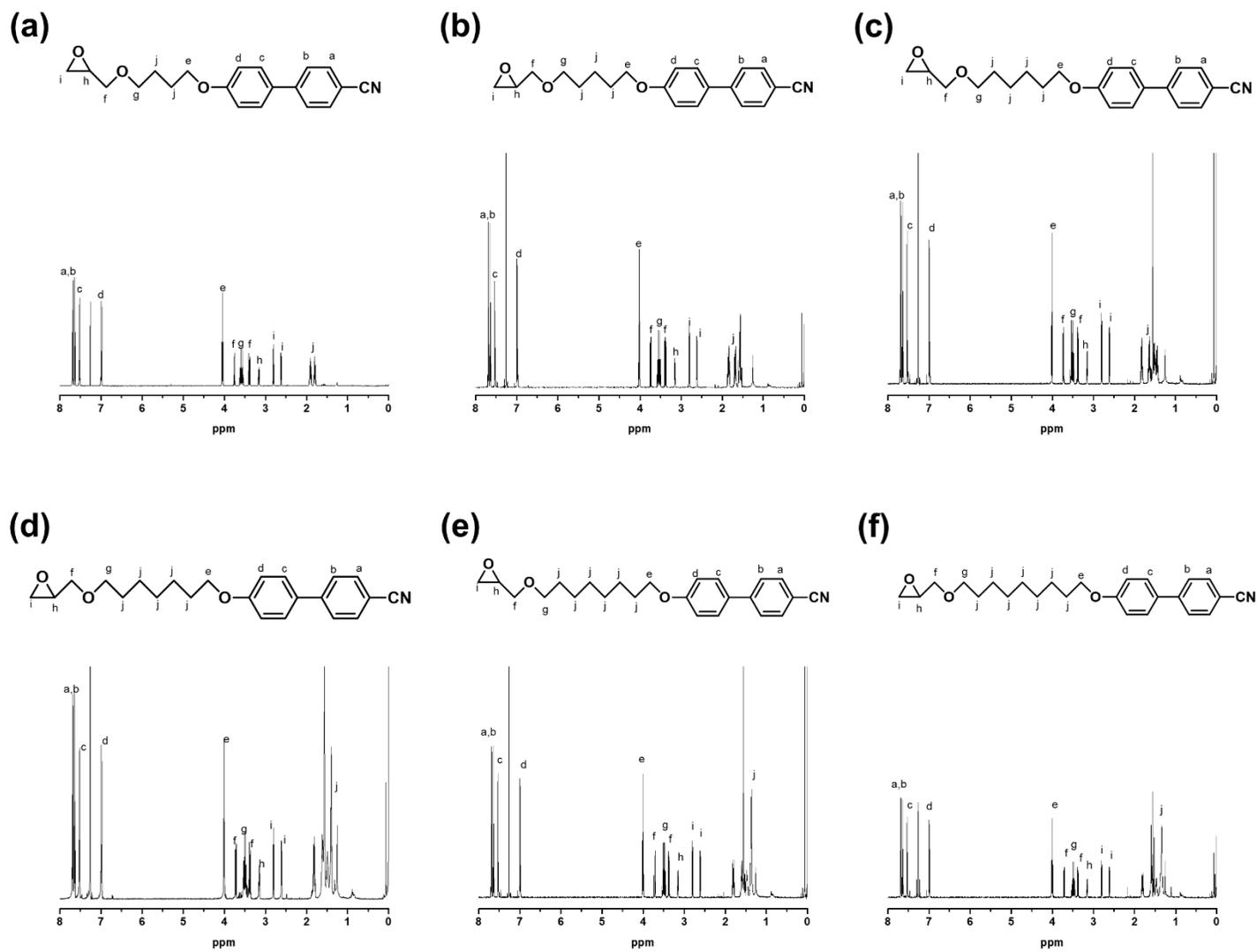
# Correlation of Self-Assembly and Thermal Conducting Properties of PEG-Backbone Polyether with Room Temperature Mesophase

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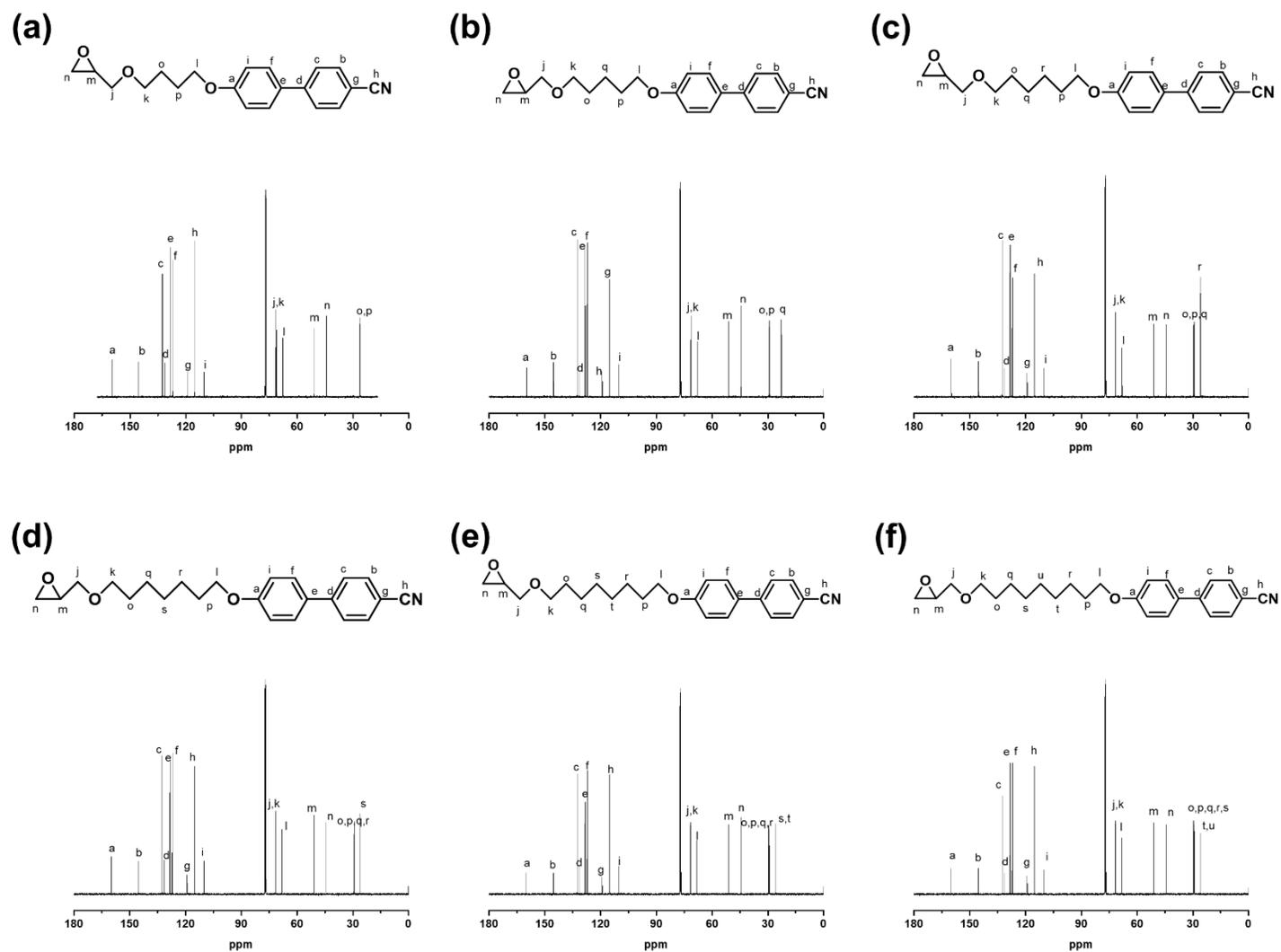
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<sup>†</sup> K. Ku and S. Choe contributed equally to this work.

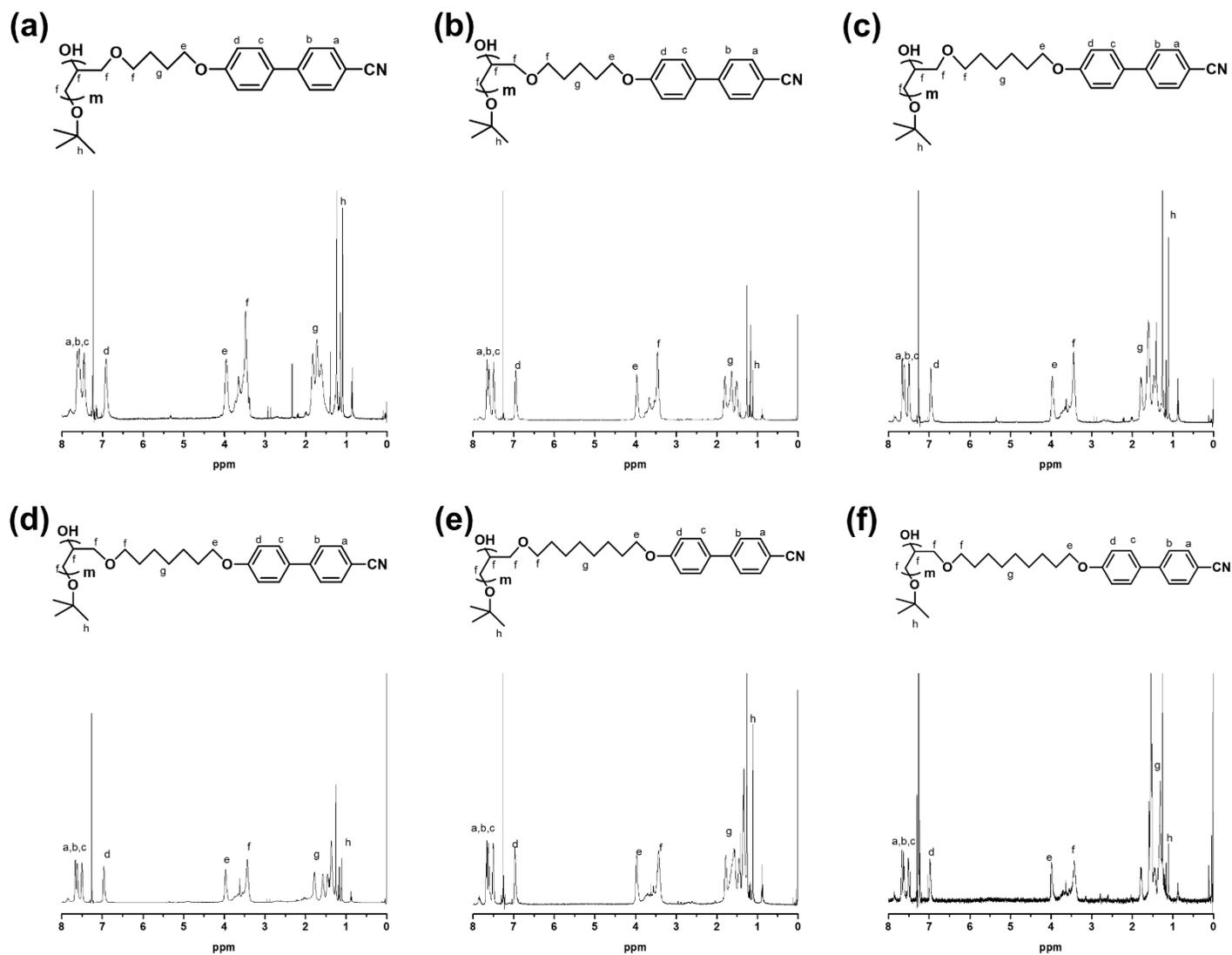
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**Figure S1.**  $^1\text{H-NMR}$  spectra of EPCN $n$  in  $\text{CDCl}_3$ : (a) EPCN4, (b) EPCN5, (c) EPCN6, (d) EPCN7, (e) EPCN8, and (f) EPCN9.

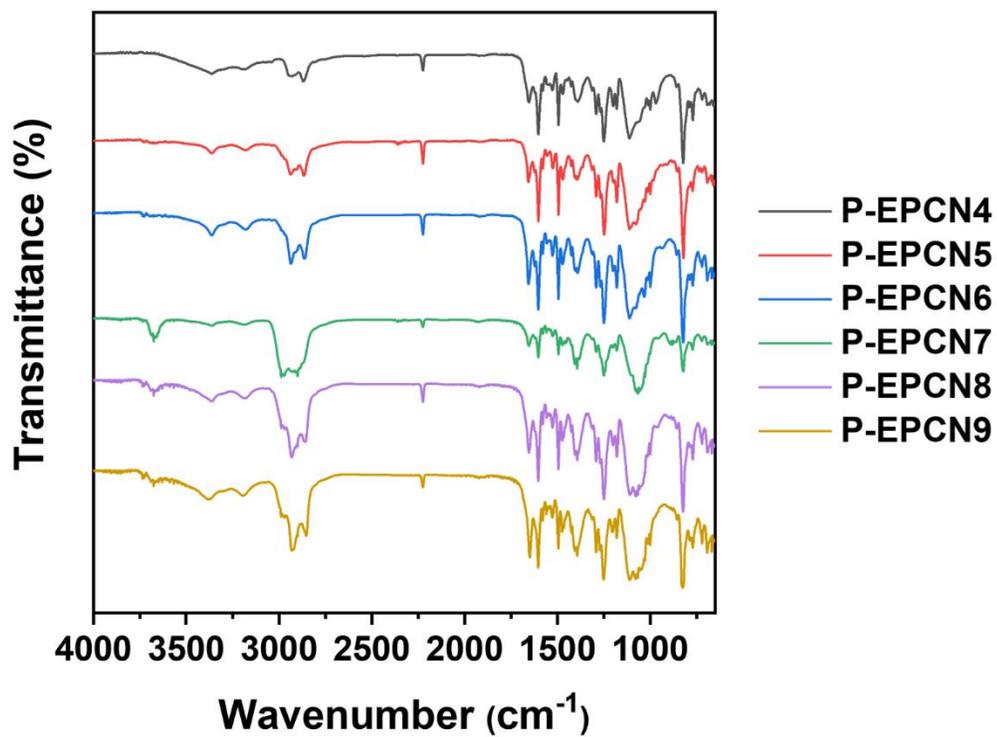


**Figure S2.**  $^{13}\text{C}$ -NMR spectra of EPCN $_n$  in  $\text{CDCl}_3$ : (a) EPCN4, (b) EPCN5, (c) EPCN6, (d) EPCN7, (e) EPCN8, and (f) EPCN9.



**Figure S3.**  $^1\text{H-NMR}$  spectra of P-EPCN $n$  in  $\text{CDCl}_3$ : (a) P-EPCN4, (b) P-EPCN5, (c) P-EPCN6, (d) P-EPCN7, (e) P-EPCN8, and (f)

P-EPCN9.



**Figure S4.** FT-IR spectra of P-EPCN<sub>n</sub>.

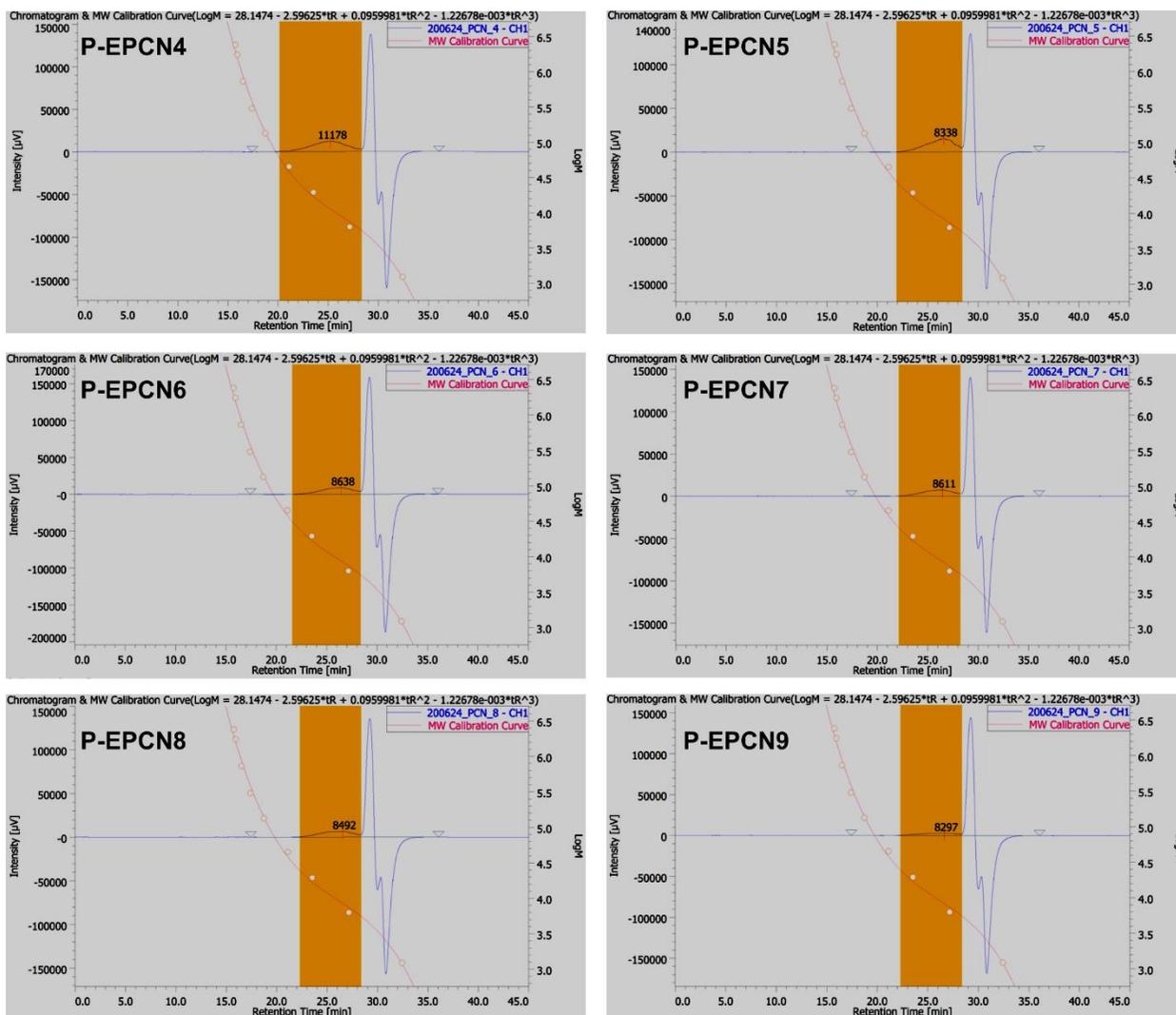
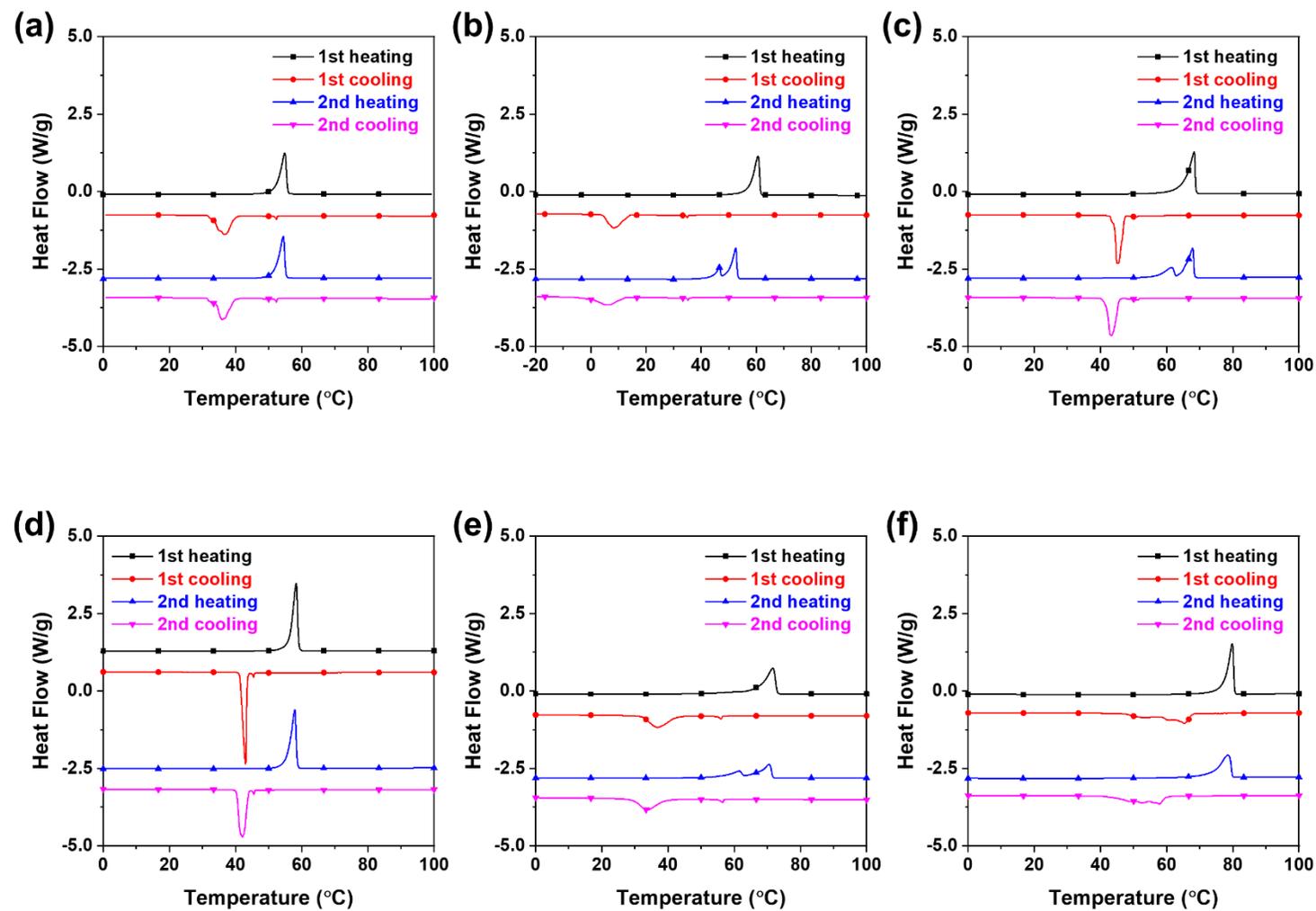


Figure S5. GPC data of P-EPCN<sub>n</sub>.



**Figure S6.** DSC curves of EPCN<sub>n</sub> at heating and cooling rate of 2 °C/min: (a) EPCN4, (b) EPCN5, (c) EPCN6, (d) EPCN7, (e) EPCN8, and (f) EPCN9.

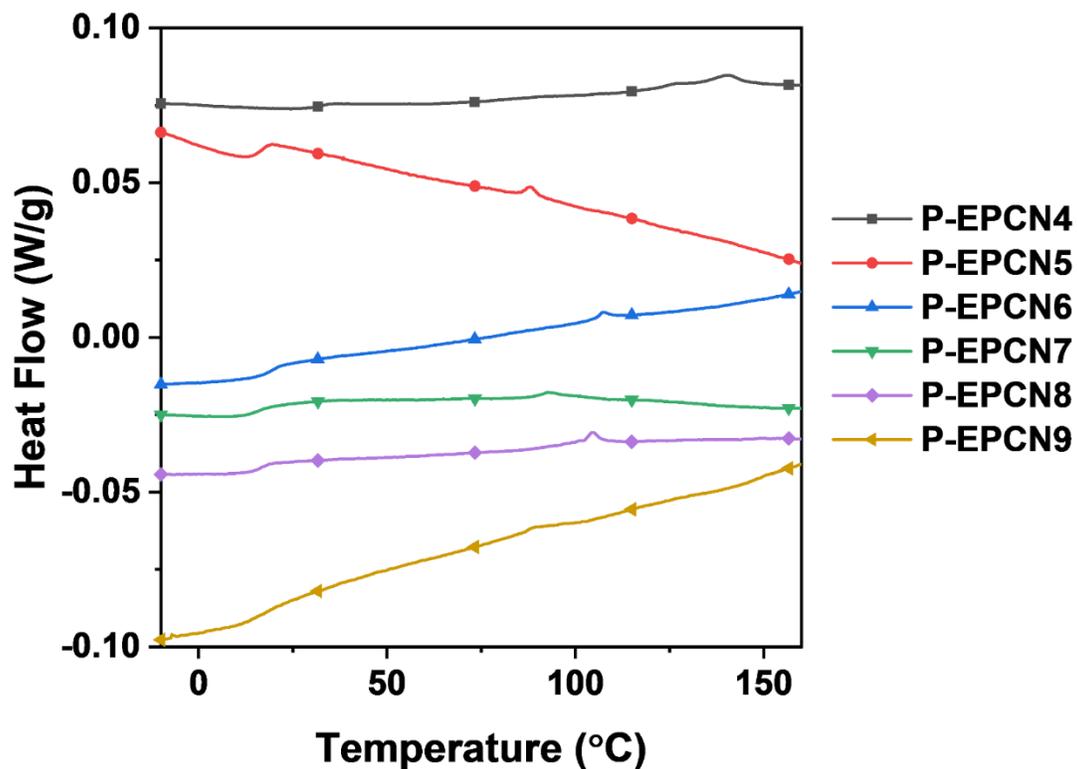
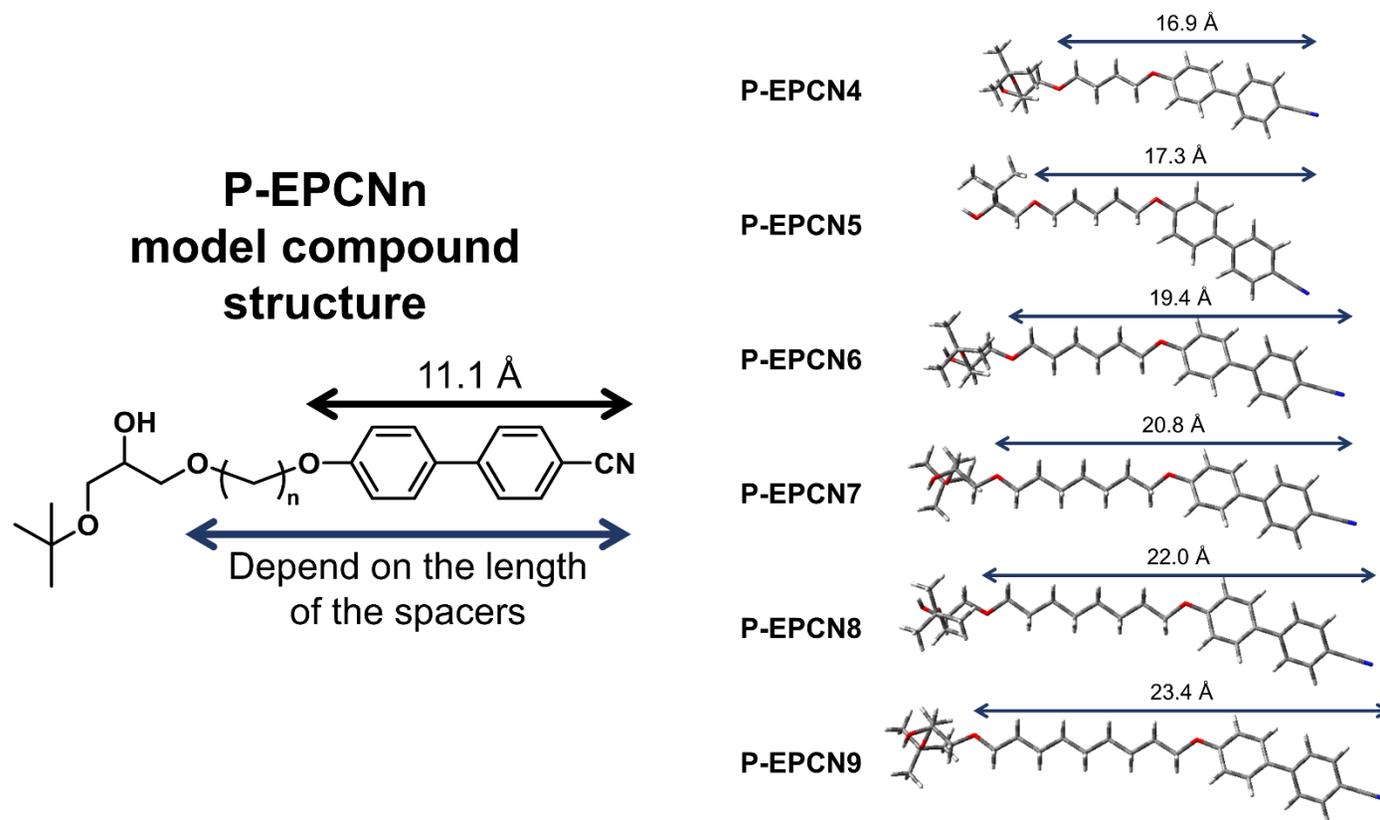


Figure S7. DSC curves of P-EPCN<sub>n</sub> in second heating cycles at heating rate of 5 °C/min.



Figure S8. The photographs of P-EPCN<sub>n</sub> in bulk states.



**Figure S9.** Optimized molecular structures of P-EPCN<sub>n</sub> model compounds calculated by density functional theory at B3LYP/6-31

level.