Electronic Supplementary Material (ESI) for Polymer Chemistry.

Polyarylene polyimides with hydrocarbon and semi-fluorinated backbones: Synthesis, characterization, and properties

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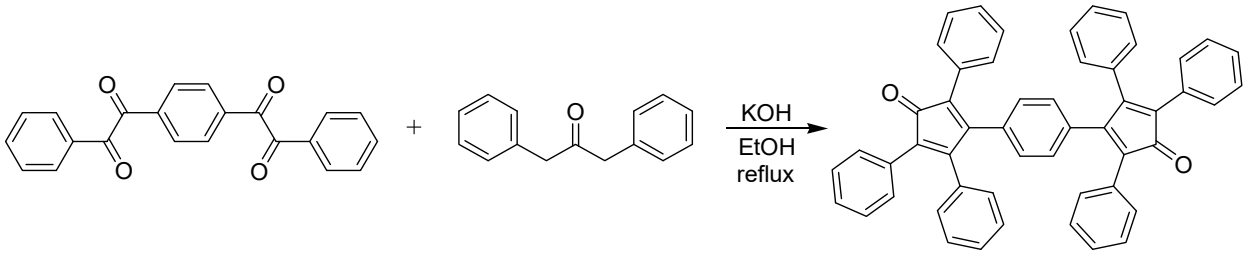

Scheme S1. 1,4-Bisbenzil and 1,3-diphenylacetone react under basic conditions to afford bistetracyclone.[1]

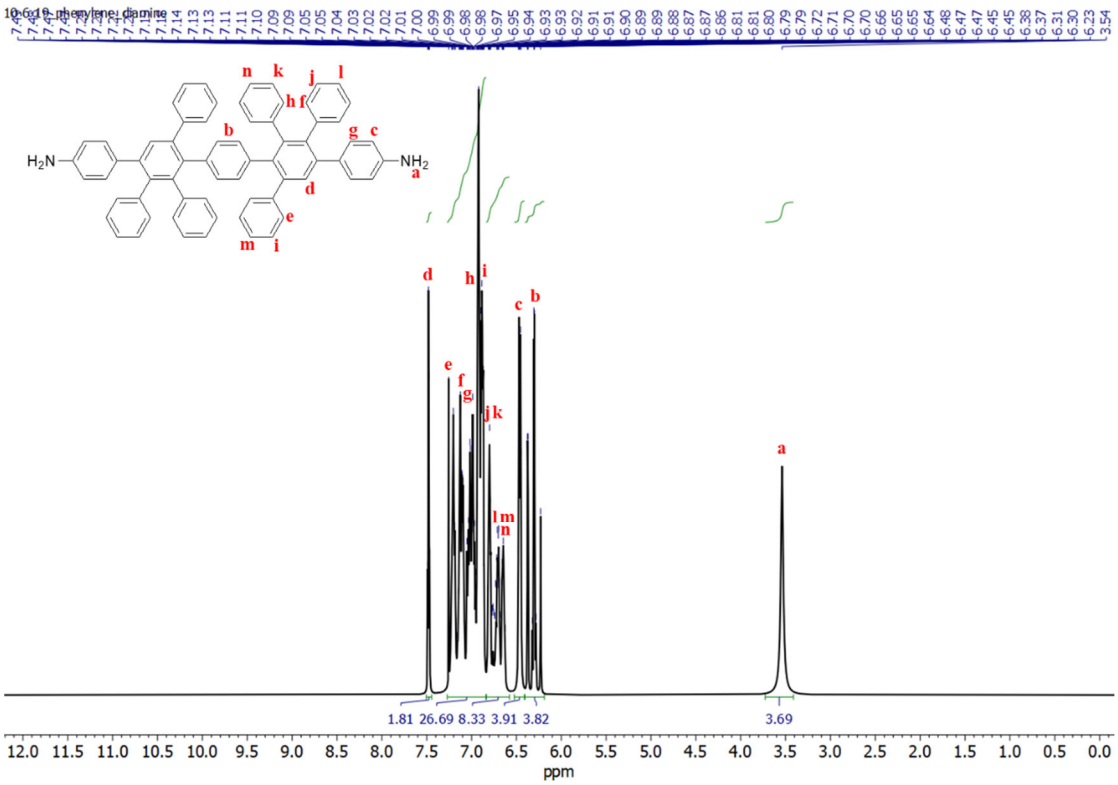

Figure S1. ^{1}H NMR (500 MHz, $CDCl_3$) spectrum of phenylated phenylenediamine.

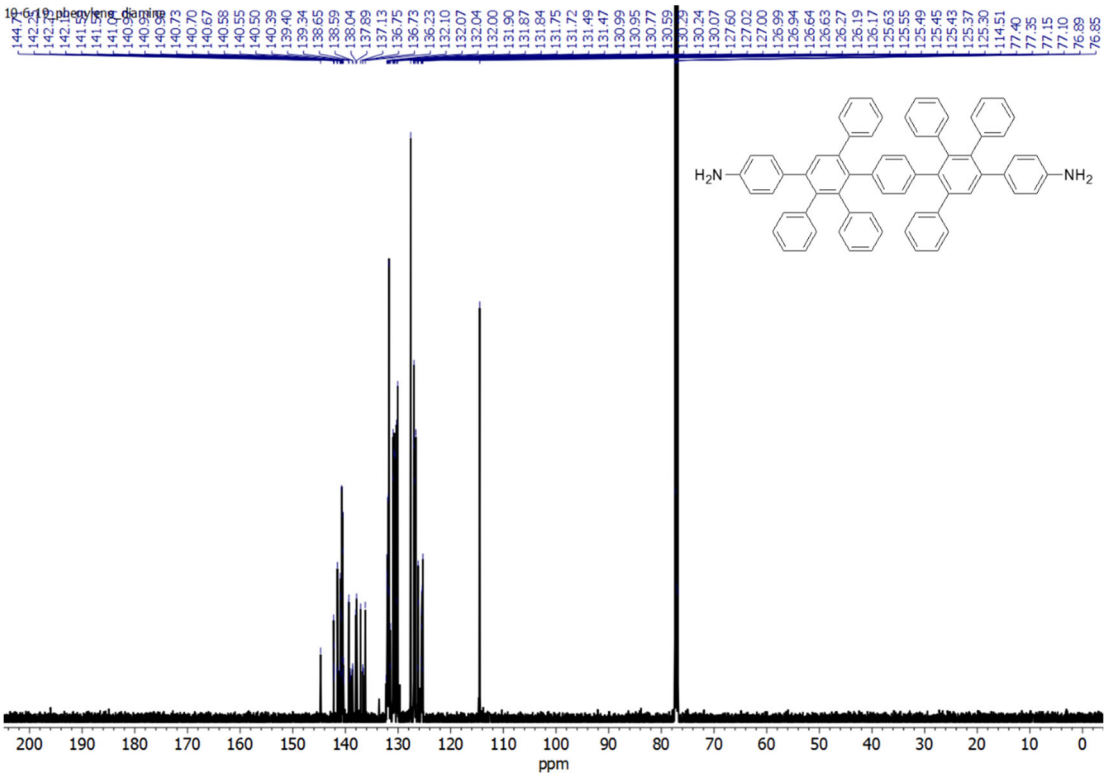

Figure S2. ^{13}C NMR (125 MHz, $CDCl_3$) spectrum of phenylated phenylenediamine.

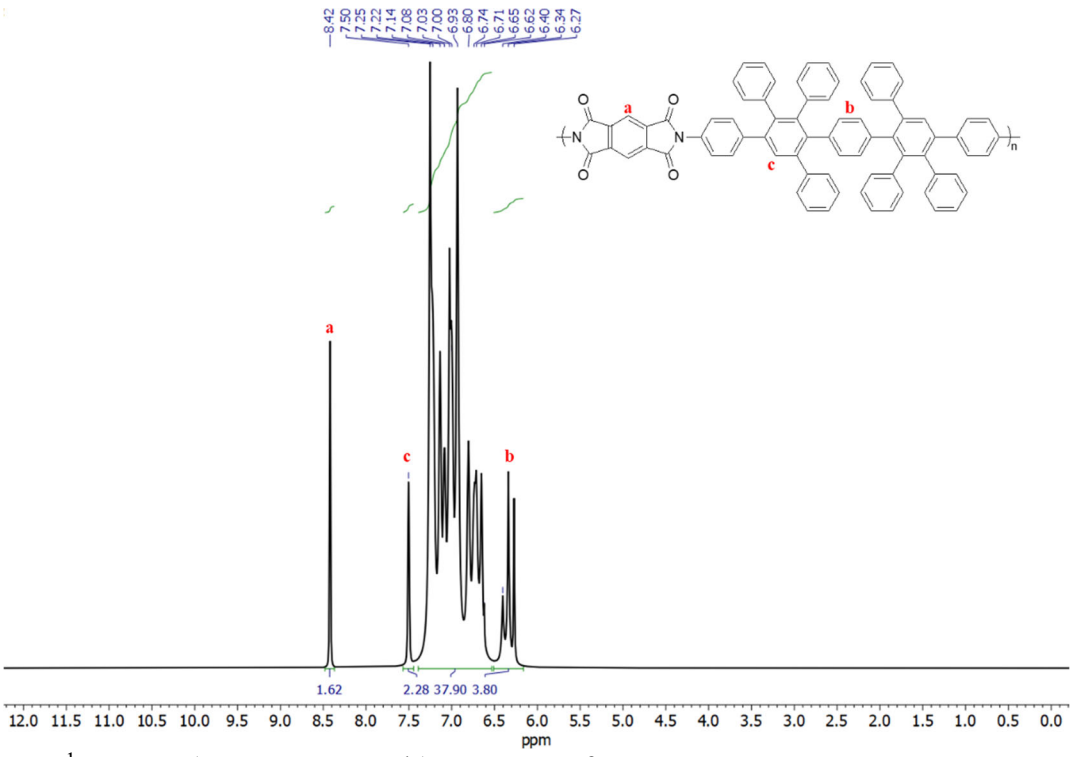

Figure S3. ^{1}H NMR (500 MHz, $CDCl_3$) spectrum of PAPI 1.

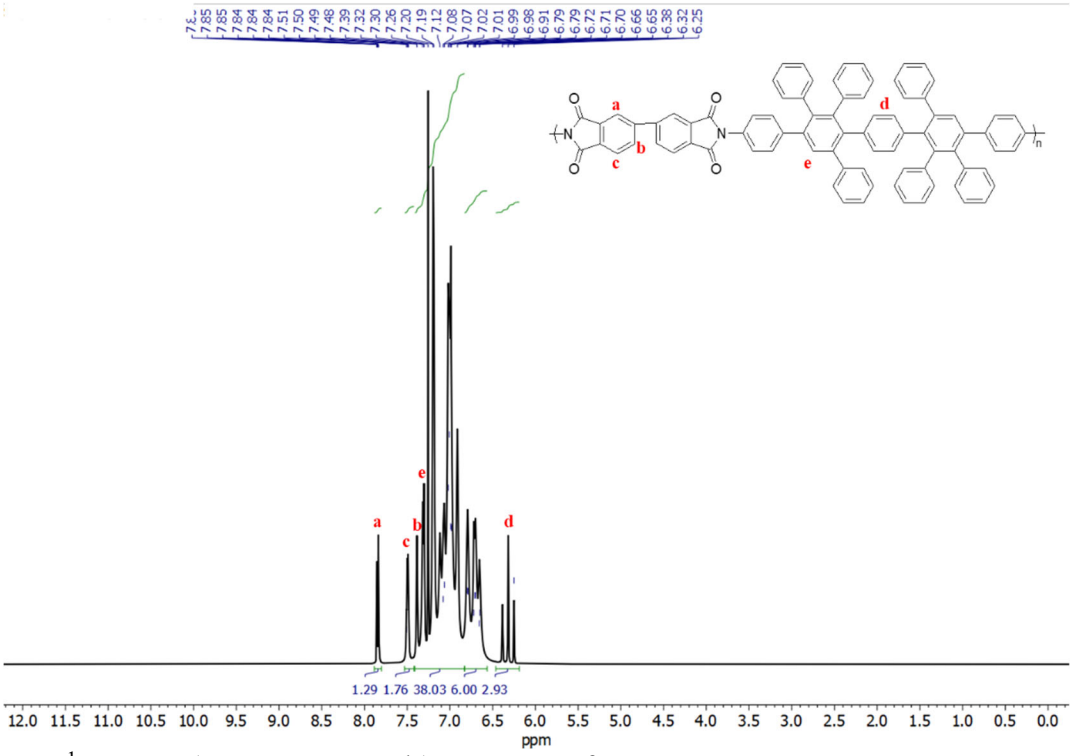

Figure S4. ^{1}H NMR (500 MHz, $CDCl_3$) spectrum of PAPI 2

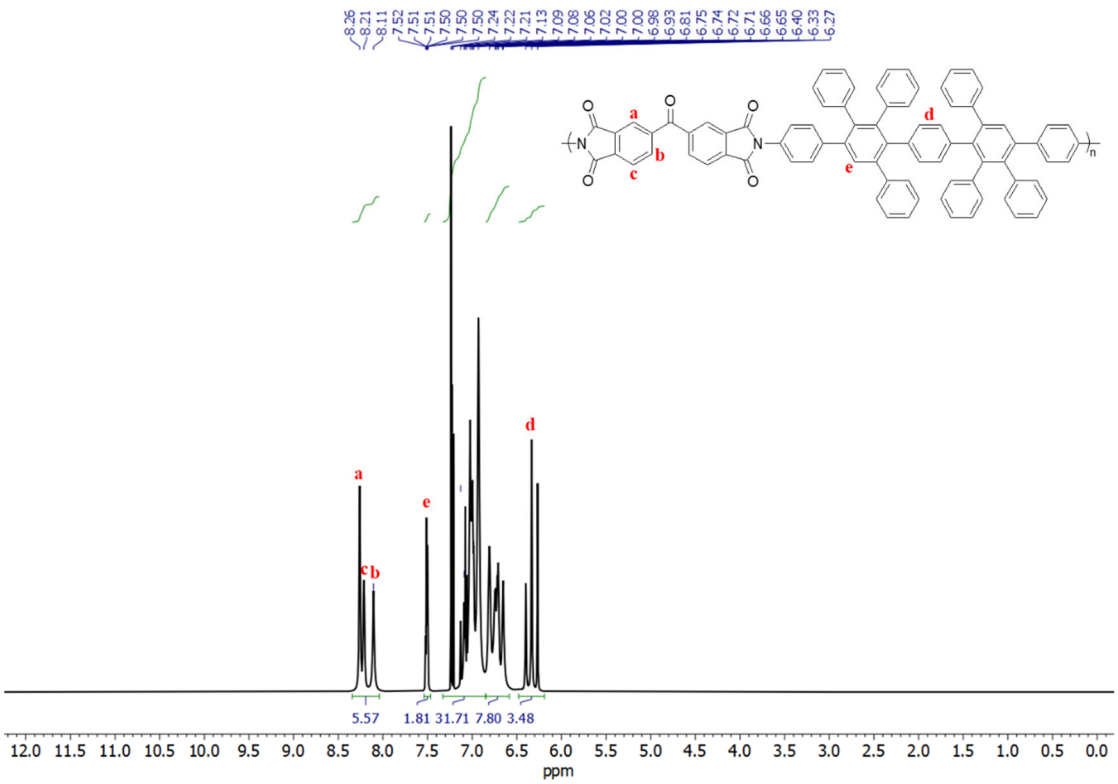

Figure S5. ^{1}H NMR (500 MHz, $CDCl_3$) spectrum of PAPI 3.

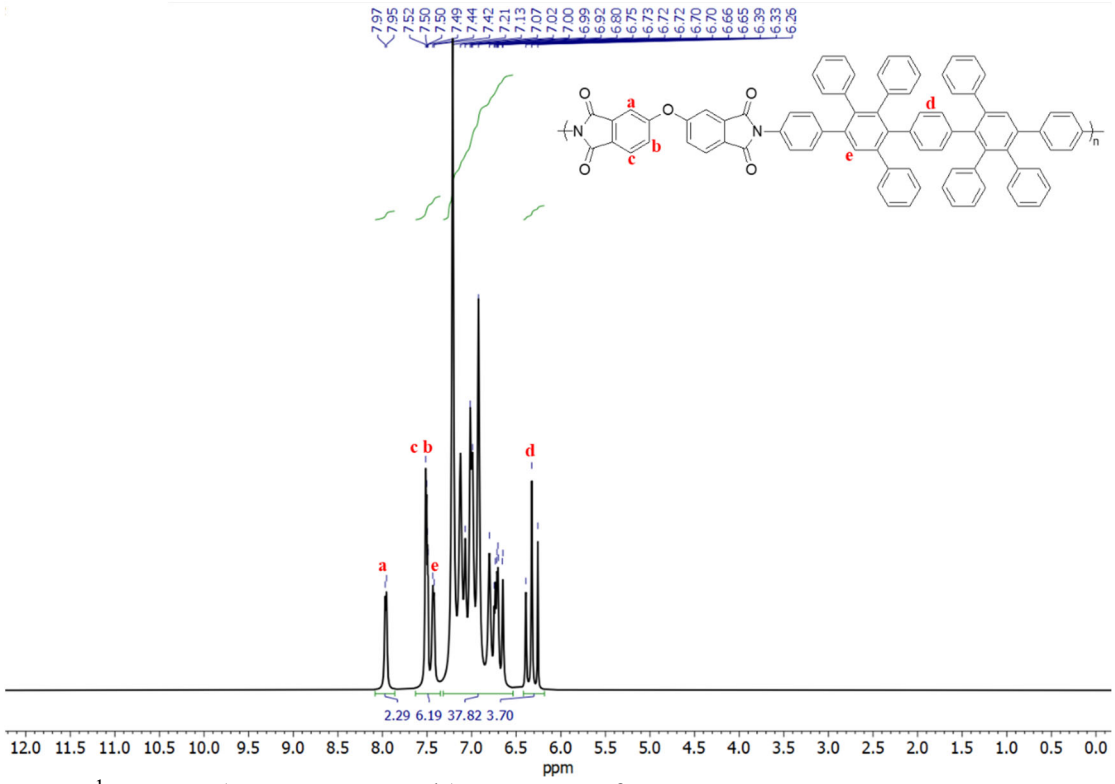

Figure S6. ^{1}H NMR (500 MHz, $CDCl_3$) spectrum of PAPI 4.

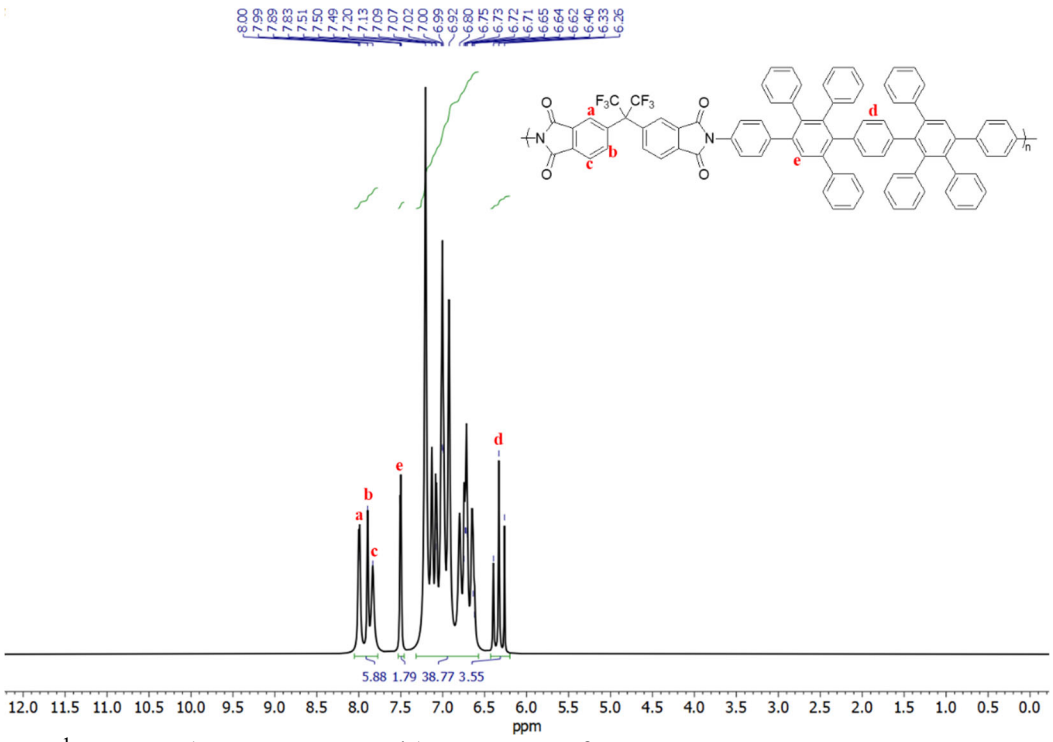

Figure S7. ^{1}H NMR (500 MHz, $CDCl_3$) spectrum of PAPI 5.

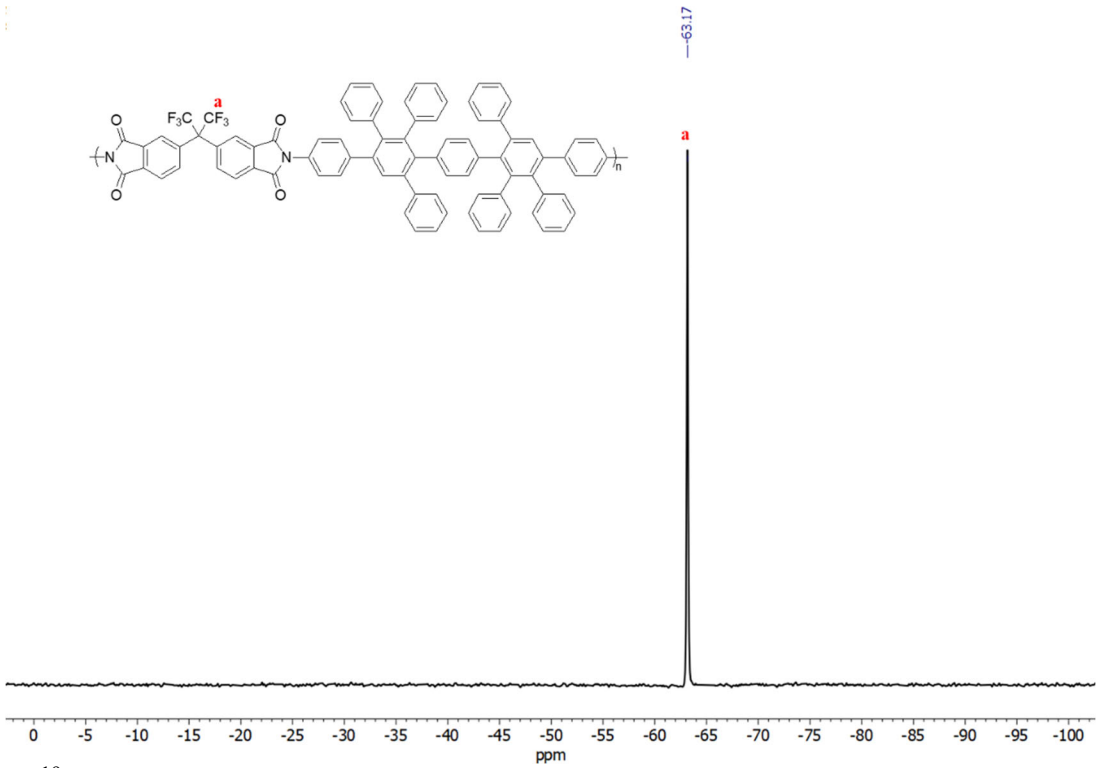

Figure S8. ^{19}F NMR (470 MHz, $CDCl_3$) spectrum of PAPI 5.

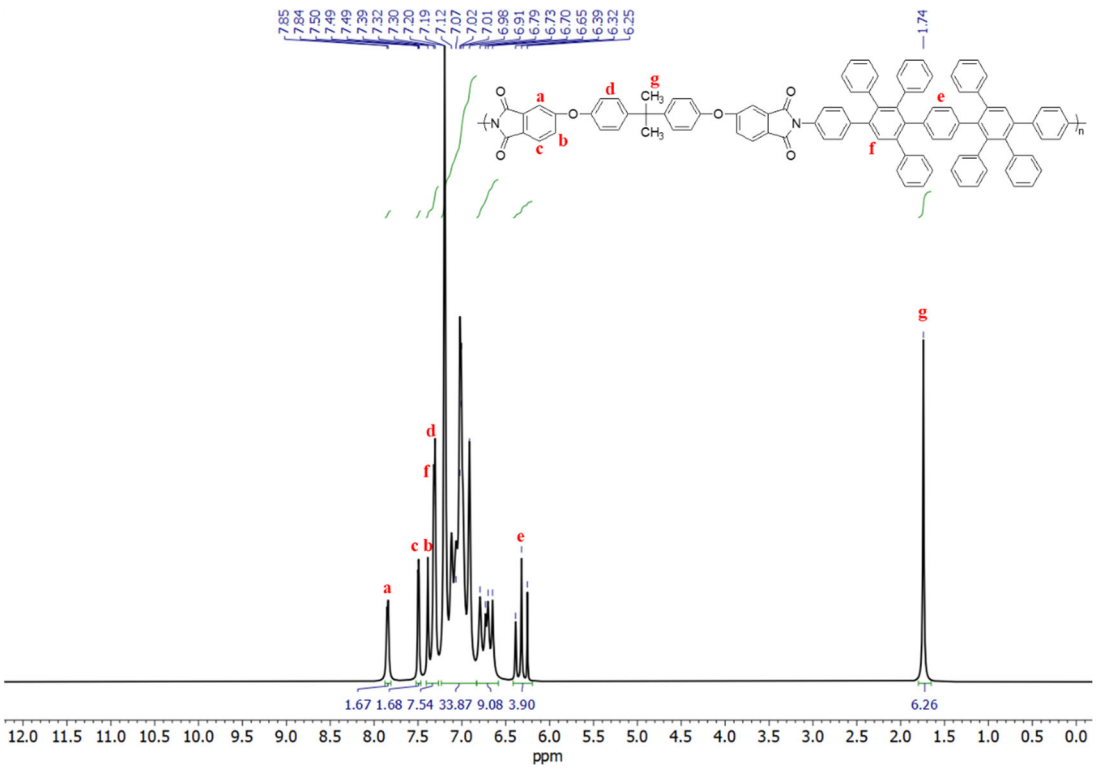

Figure S9. ^{1}H NMR (500 MHz, $CDCl_3$) spectrum of PAPI 6.

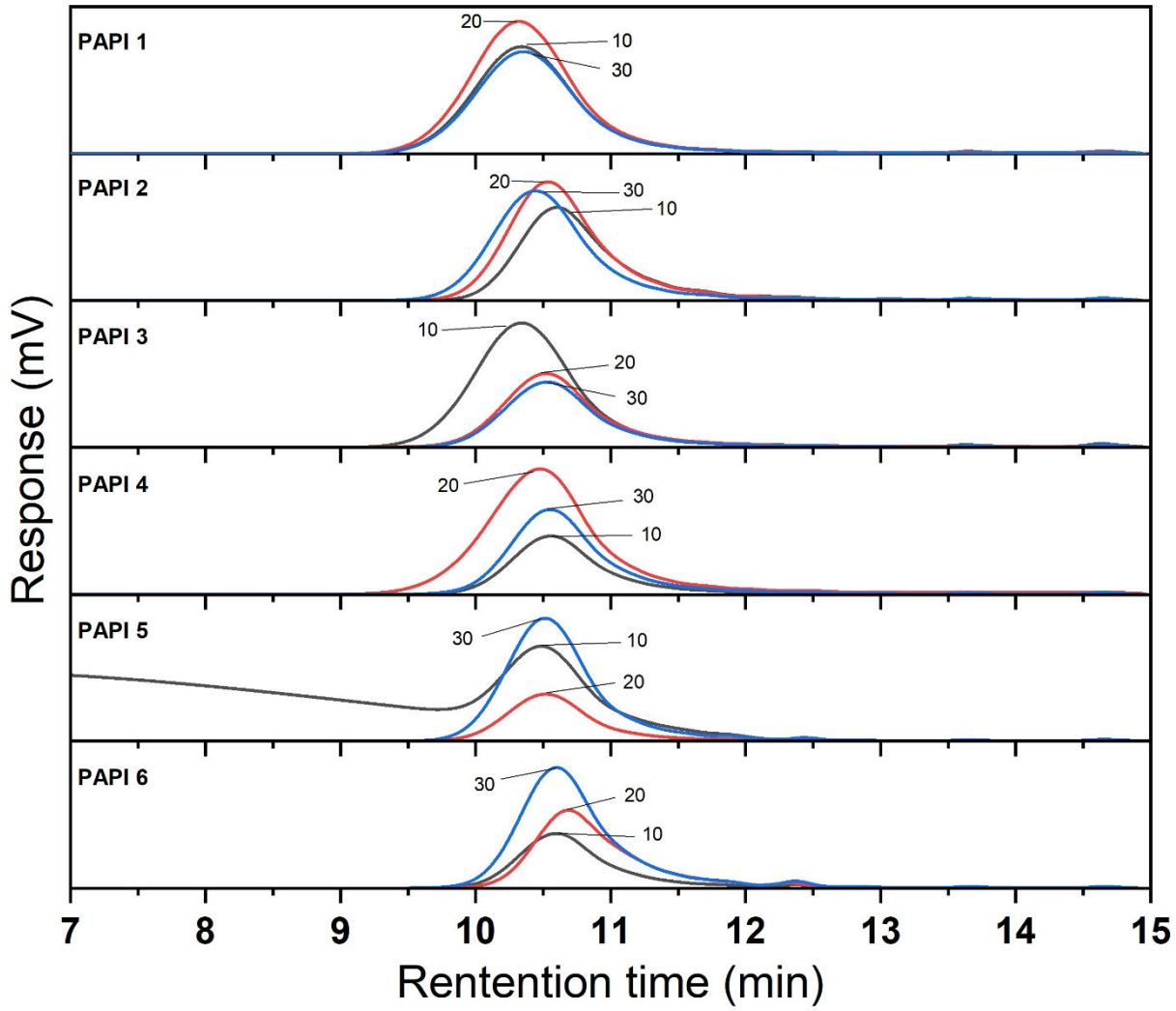

Figure S10. Gel permeation chromatography (GPC) results for PAPI 1-6 at 10, 20, and 30 min; 4 columns at 40 °C, HPLC-grade THF at a flow rate = 0.35 mL/min, polymer sample concentration = 1 mg/mL filtered through 0.2-µm PTFE syringe filter, refractive index detector, and calibration based on linear polystyrene standards.

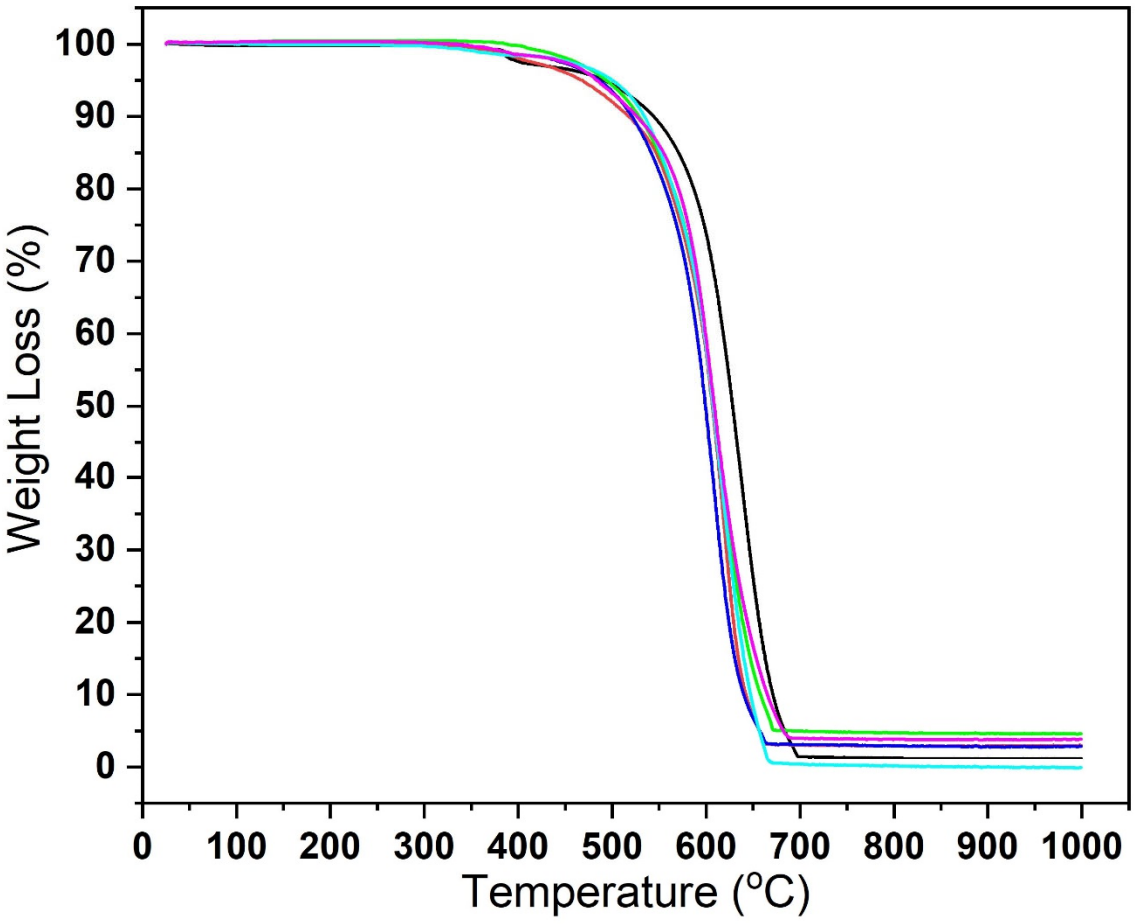

Figure S11. Thermal gravimetric analysis (TGA) results of PAPI 1-6 using a heating rate of 10 °C/min and under an atmosphere of air.

REFERENCES

1. Skalski, T. J. G.; Britton, B.; Peckham, T. J.; Holdcroft, S., Structurally-Defined, Sulfo-Phenylated, Oligophenylenes and Polyphenylenes. *J. Am. Chem. Soc.* **2015,** *137* (38), 12223-12226.