Supplementary Information

Tailoring the charge transport characteristics in ordered small-molecule organic semiconductors by side-chain engineering and fluorine substitution

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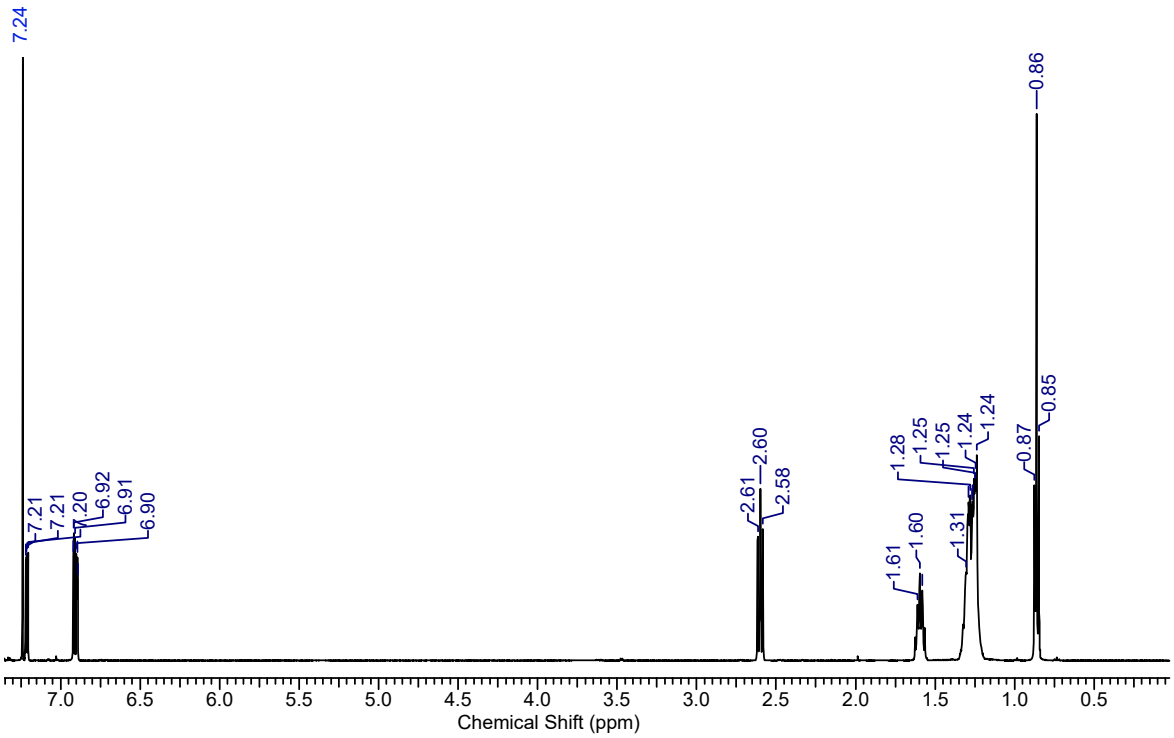

Figure S1. ^{1}H NMR spectrum of compound **1a**

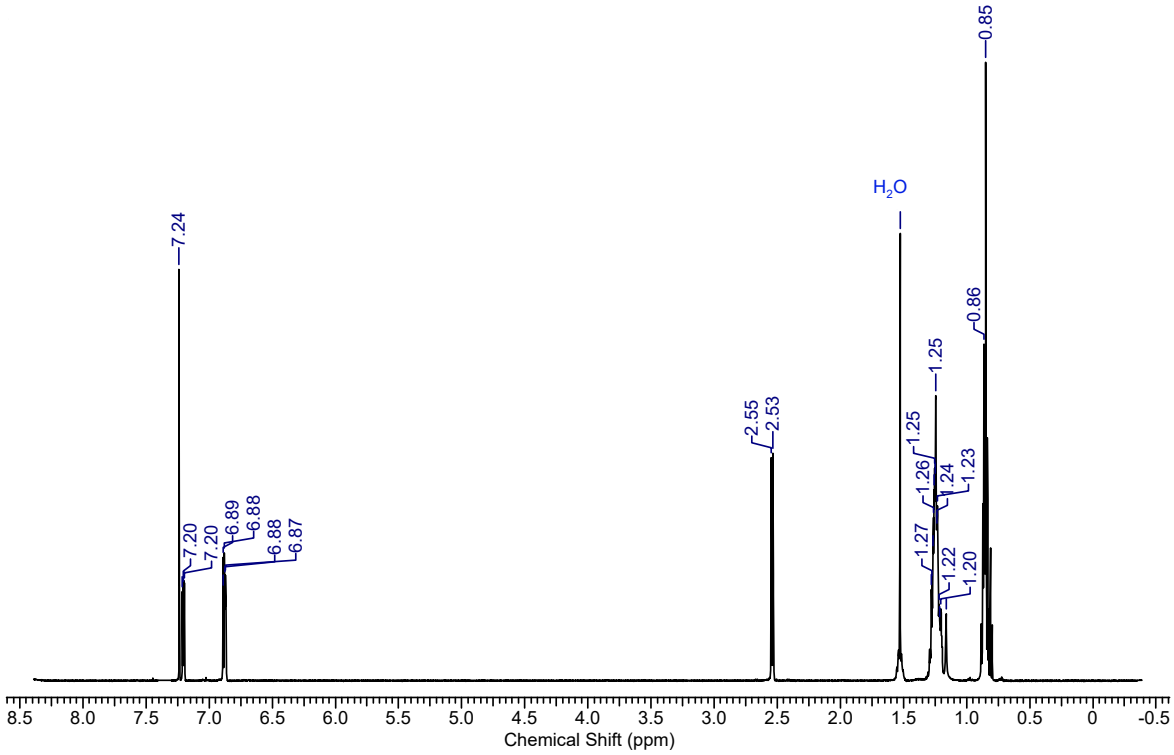

Figure S2. ^{1}H NMR spectrum of compound **1b**

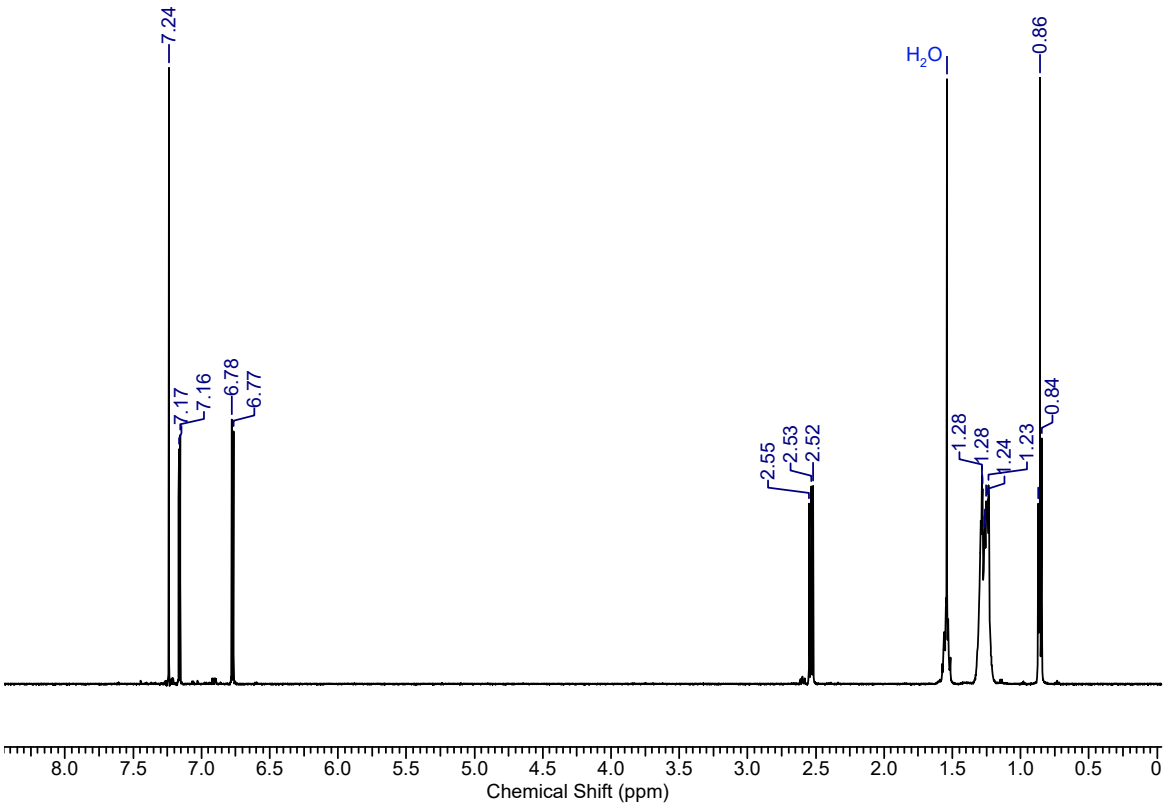

Figure S3. ^{1}H NMR spectrum of compound **2a**

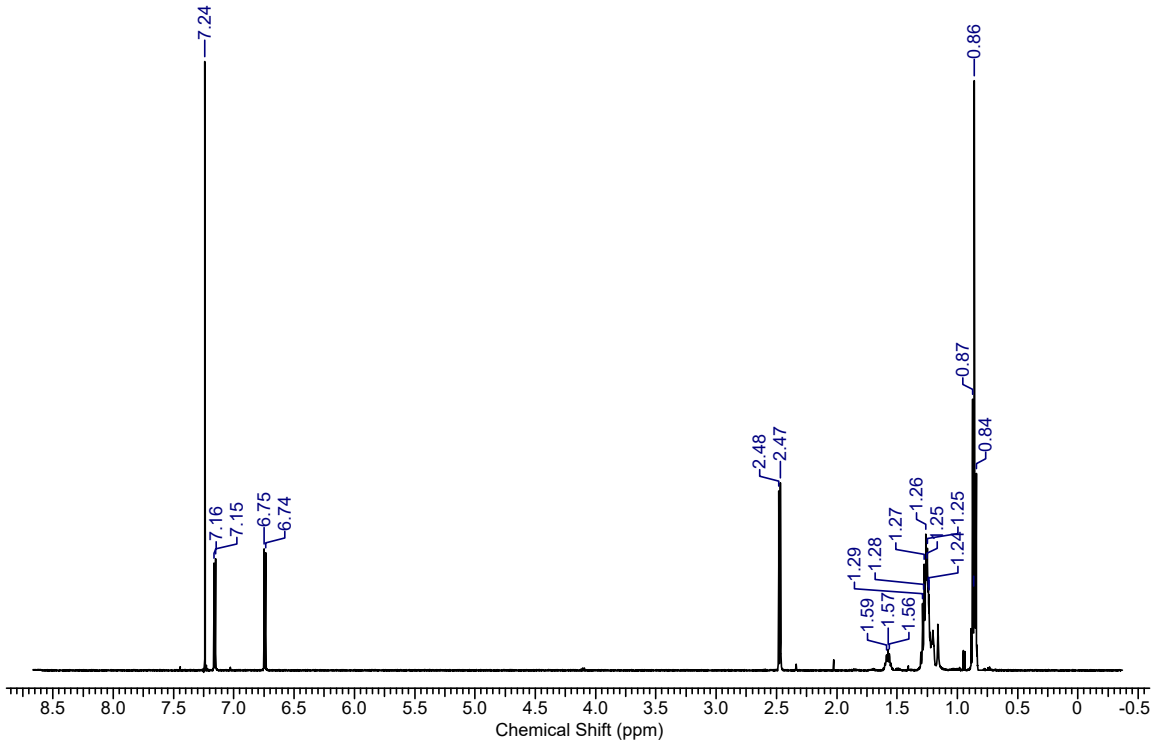

Figure S4. ^{1}H NMR spectrum of compound **2b**

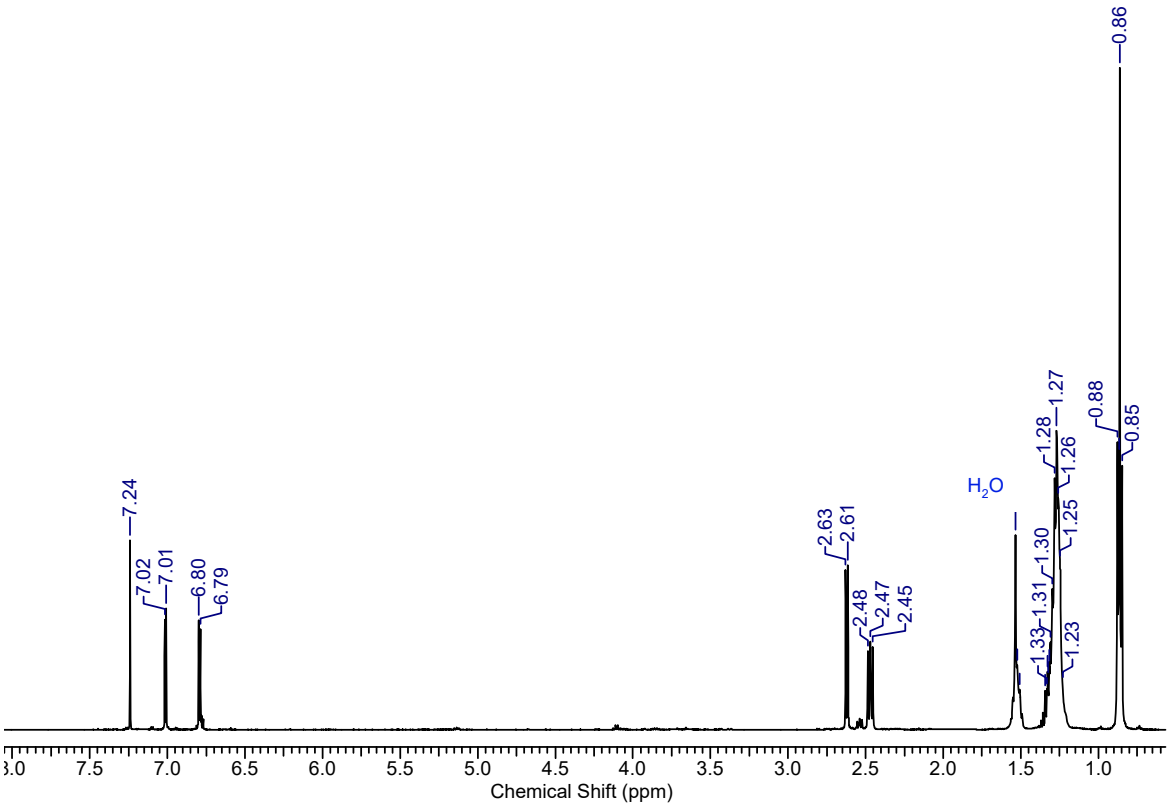

Figure S5. ^{1}H NMR spectrum of compound **3a**

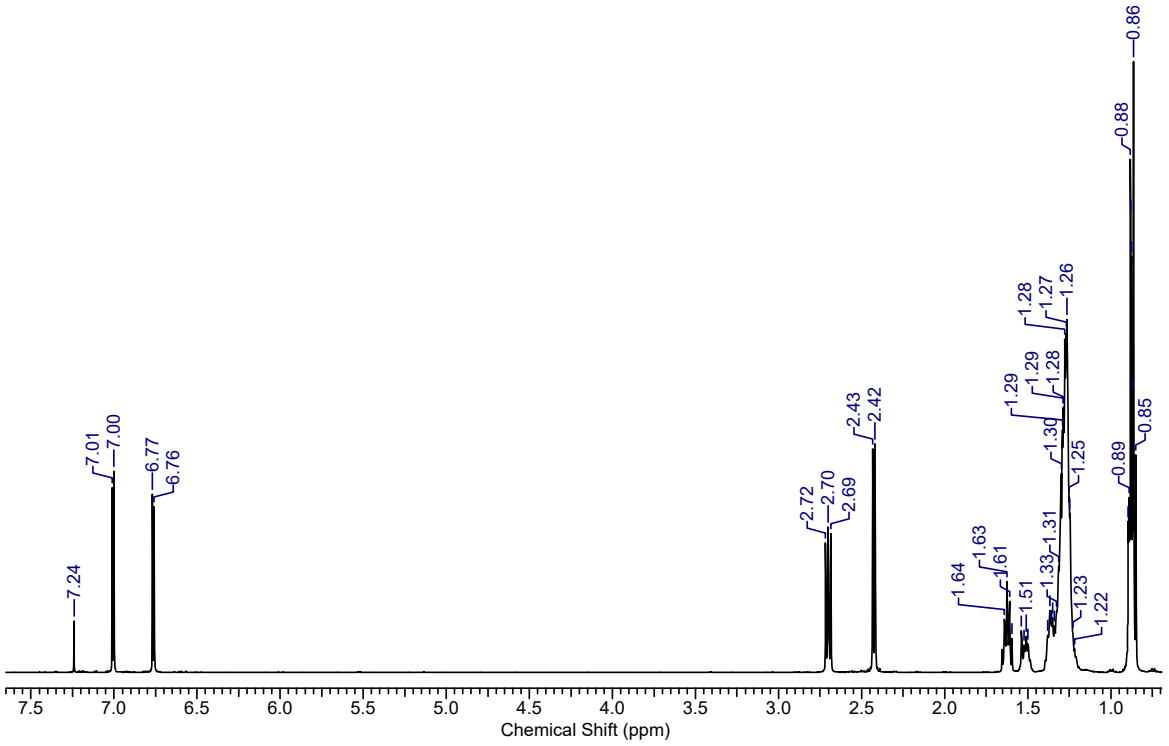

Figure S6. ^{1}H NMR spectrum of compound **3b**

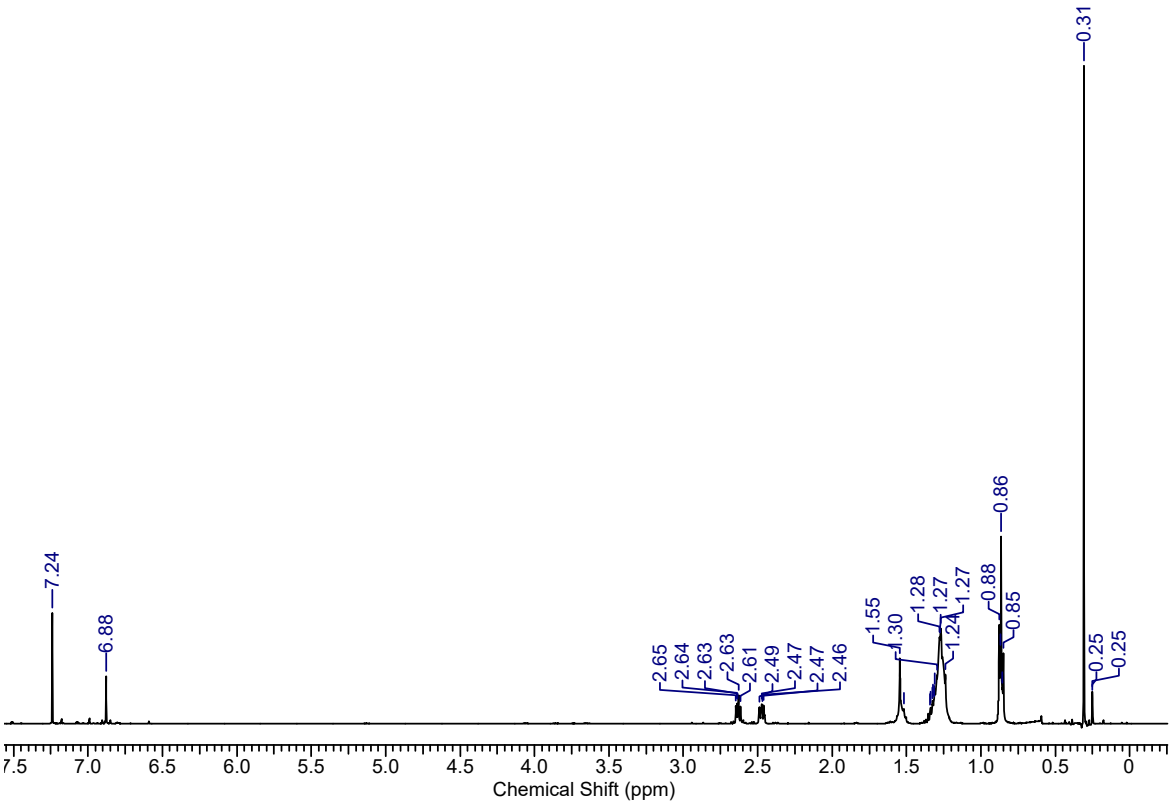

Figure S7. ^{1}H NMR spectrum of compound **4a**

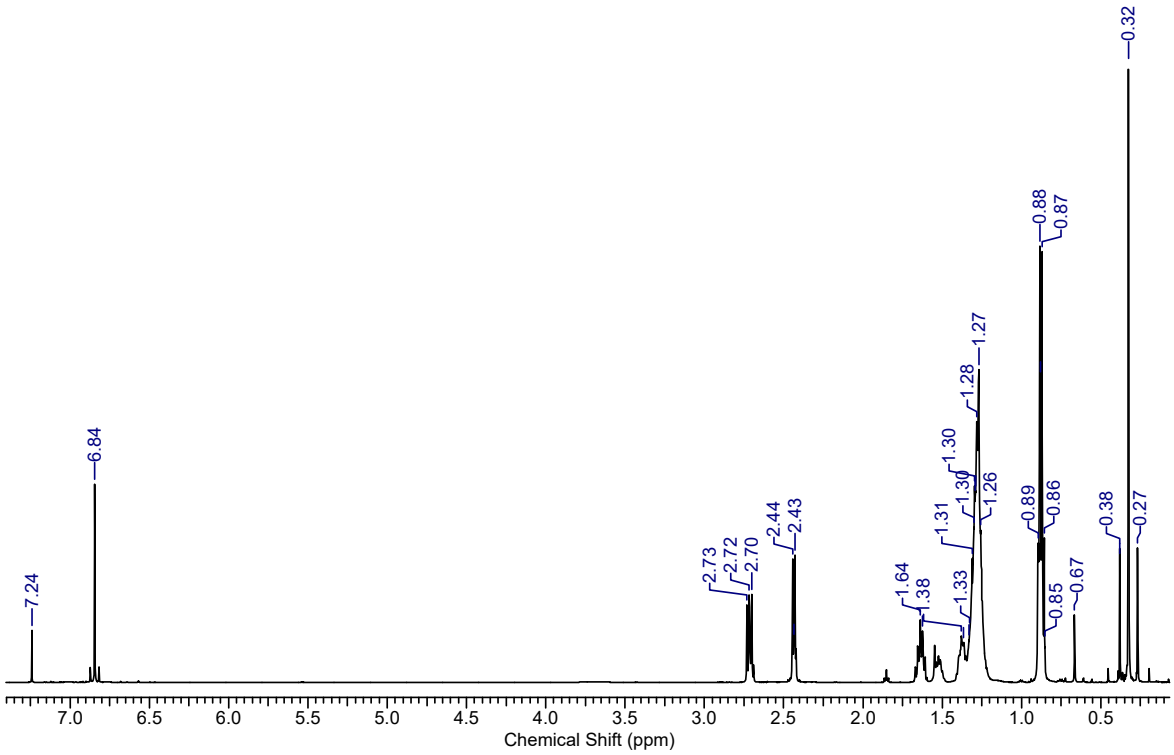

Figure S8. ^{1}H NMR spectrum of compound **4b**

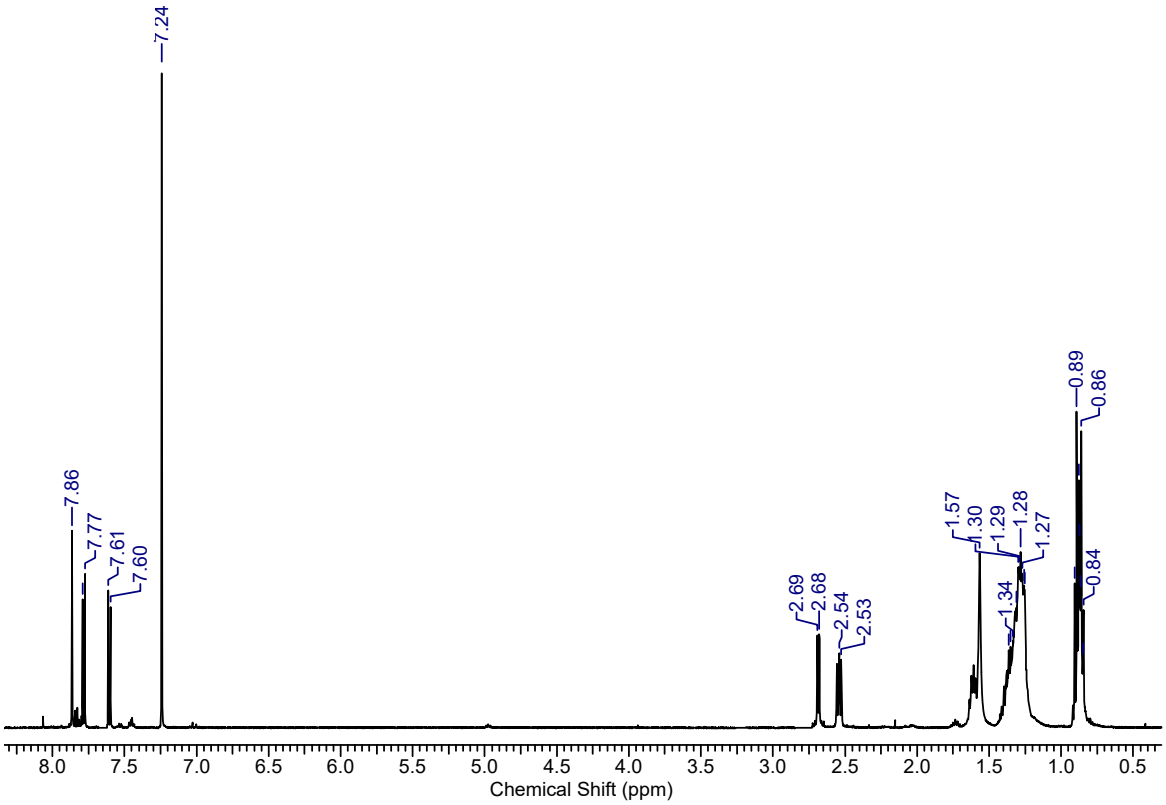

Figure S9. ^{1}H NMR spectrum of compound **5a**

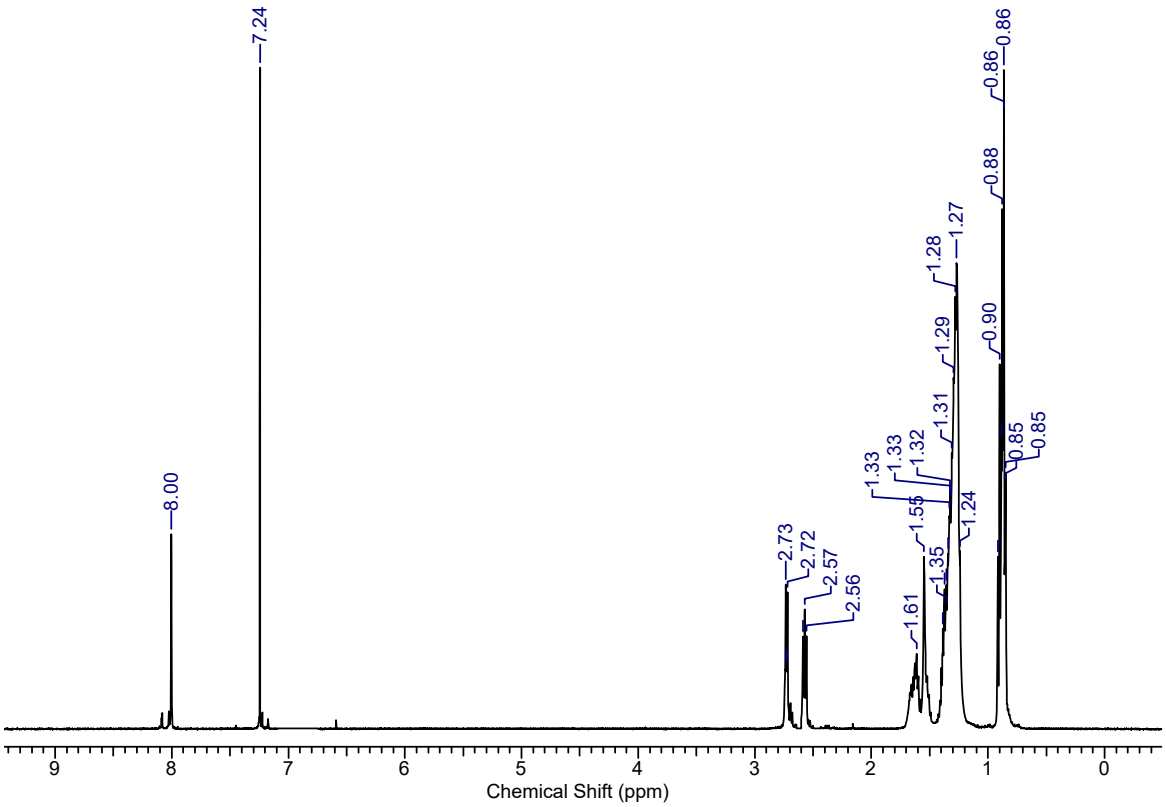

Figure S10. ^{1}H NMR spectrum of compound **5b**

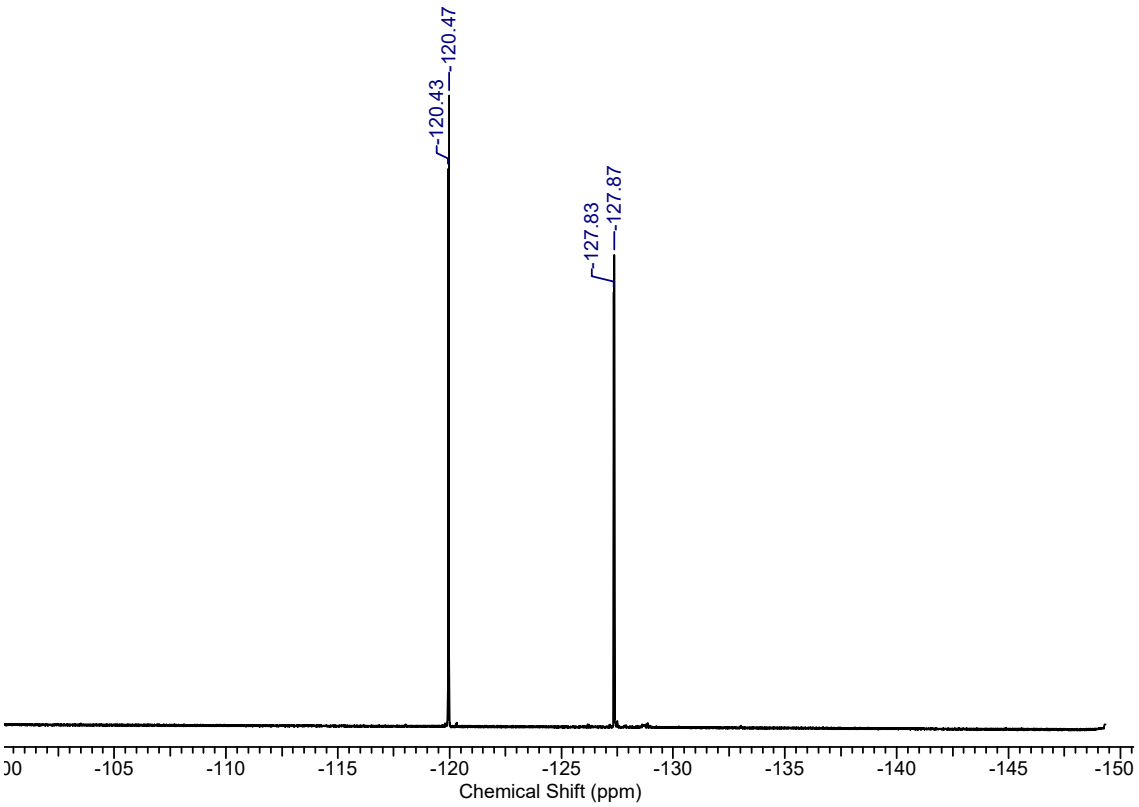

Figure S11. ^{19}F NMR spectrum of compound **5b**

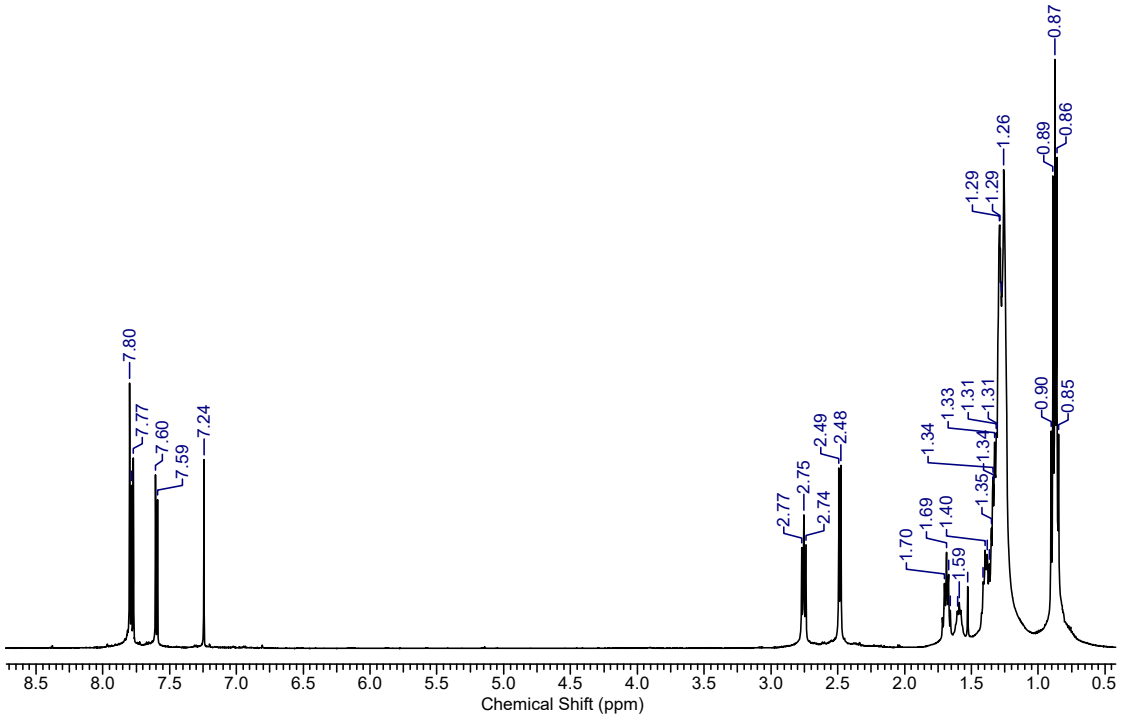

Figure S12. ^{1}H NMR spectrum of compound **5c**

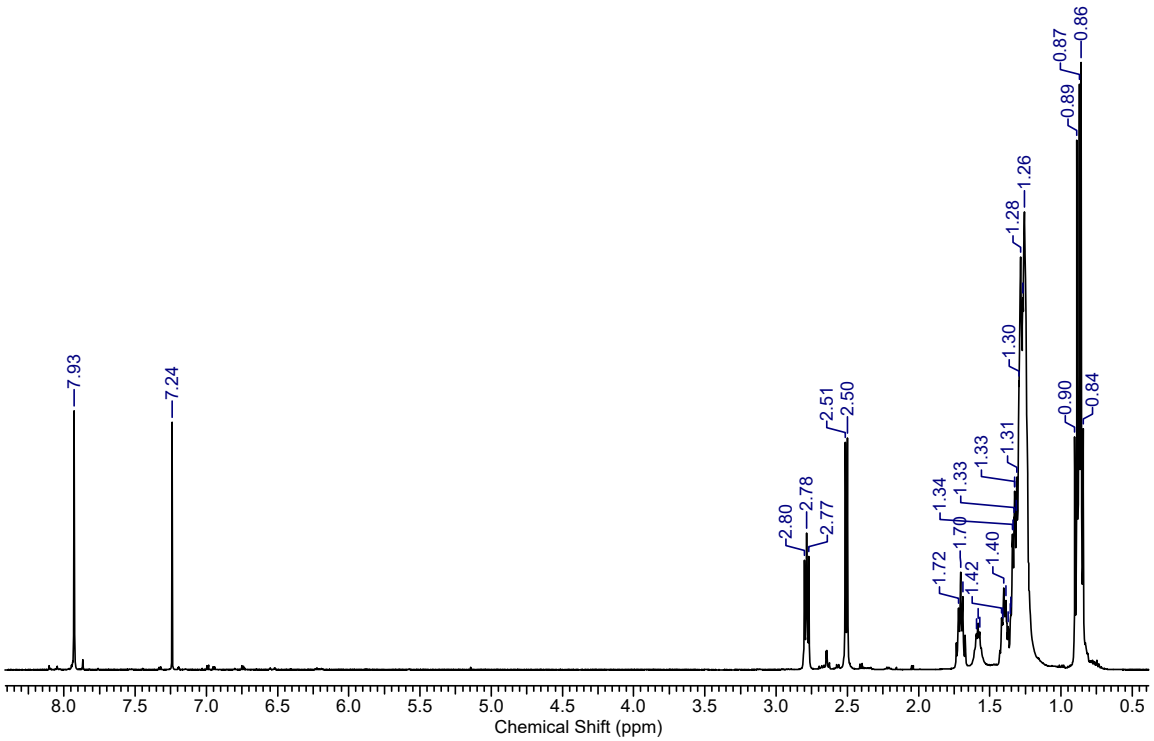

Figure S13. ^{1}H NMR spectrum of compound **5d**

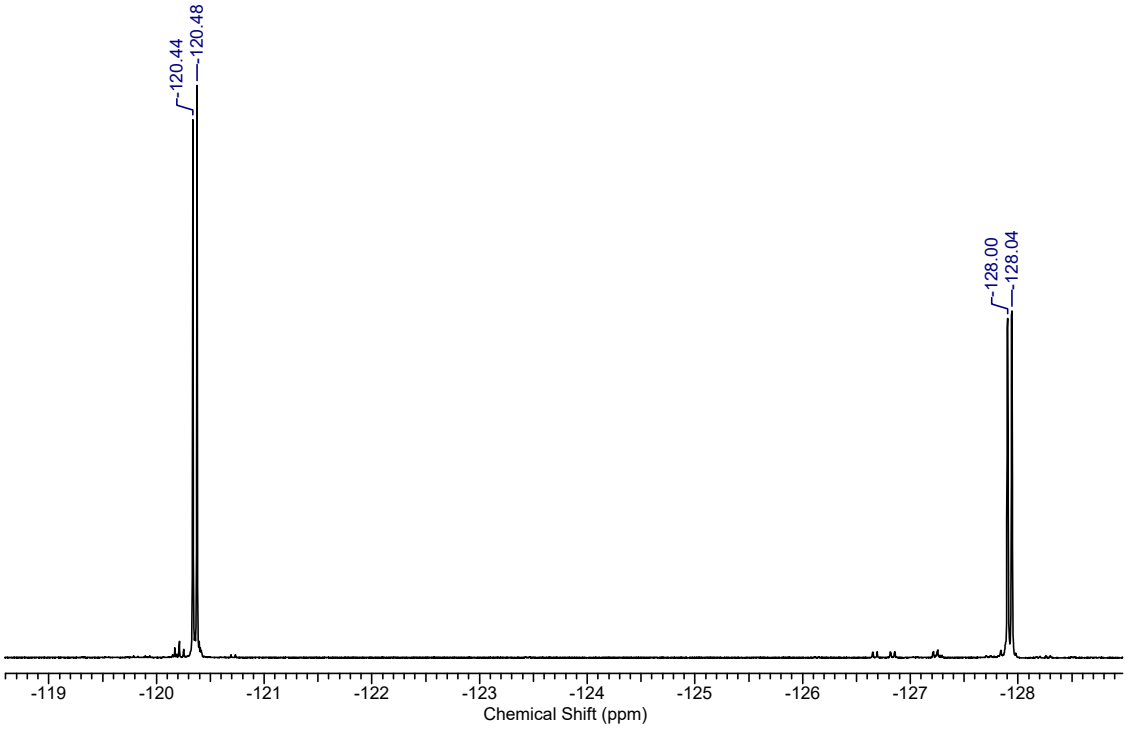

Figure S14. ^{19}F NMR spectrum of compound **5d**

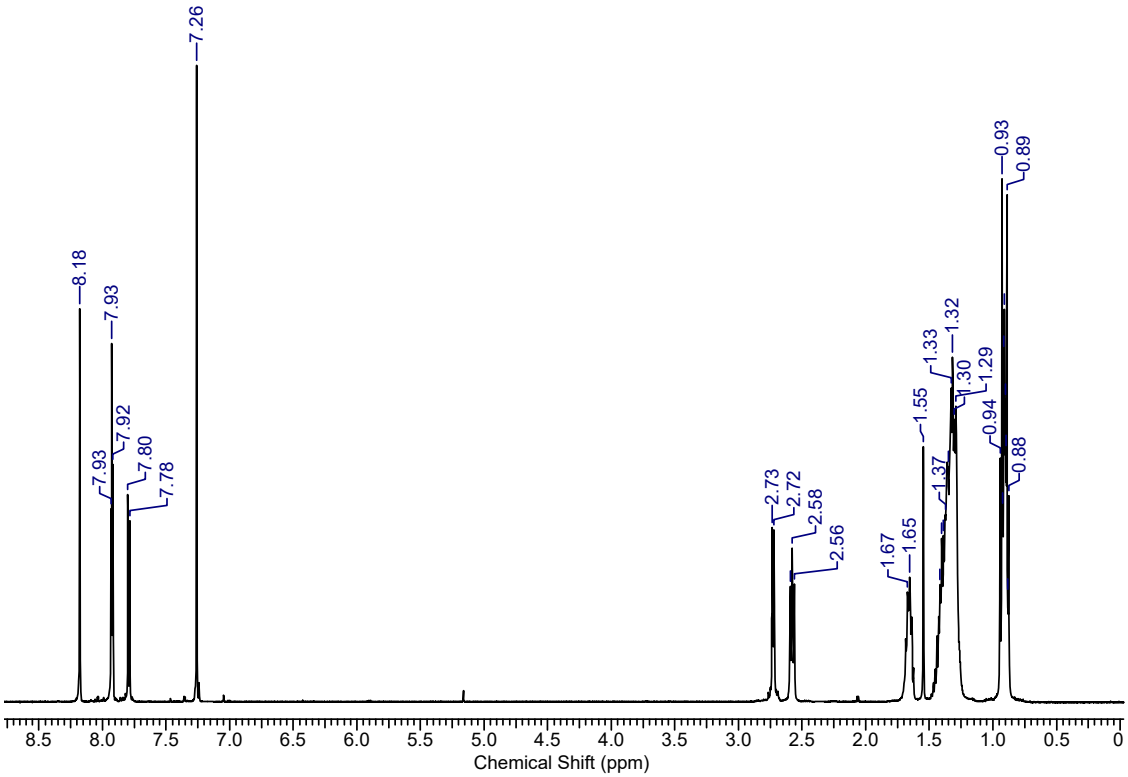

Figure S15. ^{1}H NMR spectrum of compound **M1**

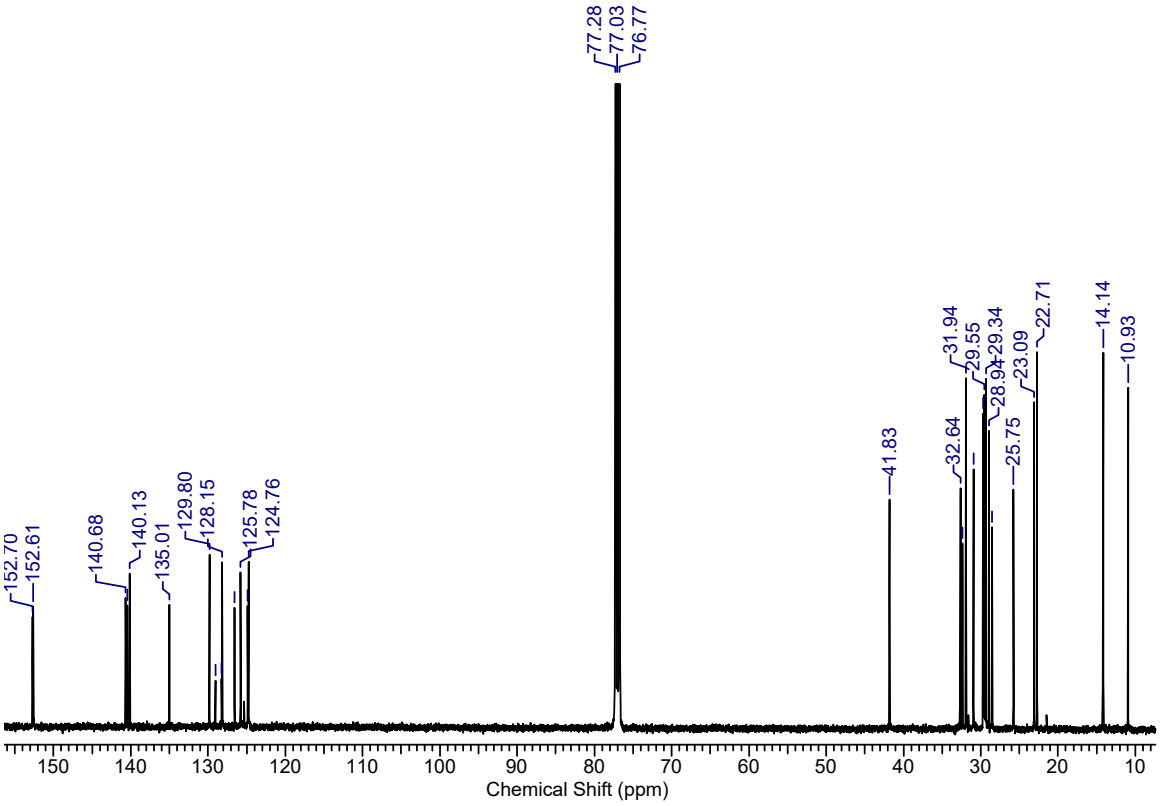

Figure S16. ^{13}C NMR spectrum of compound **M1**

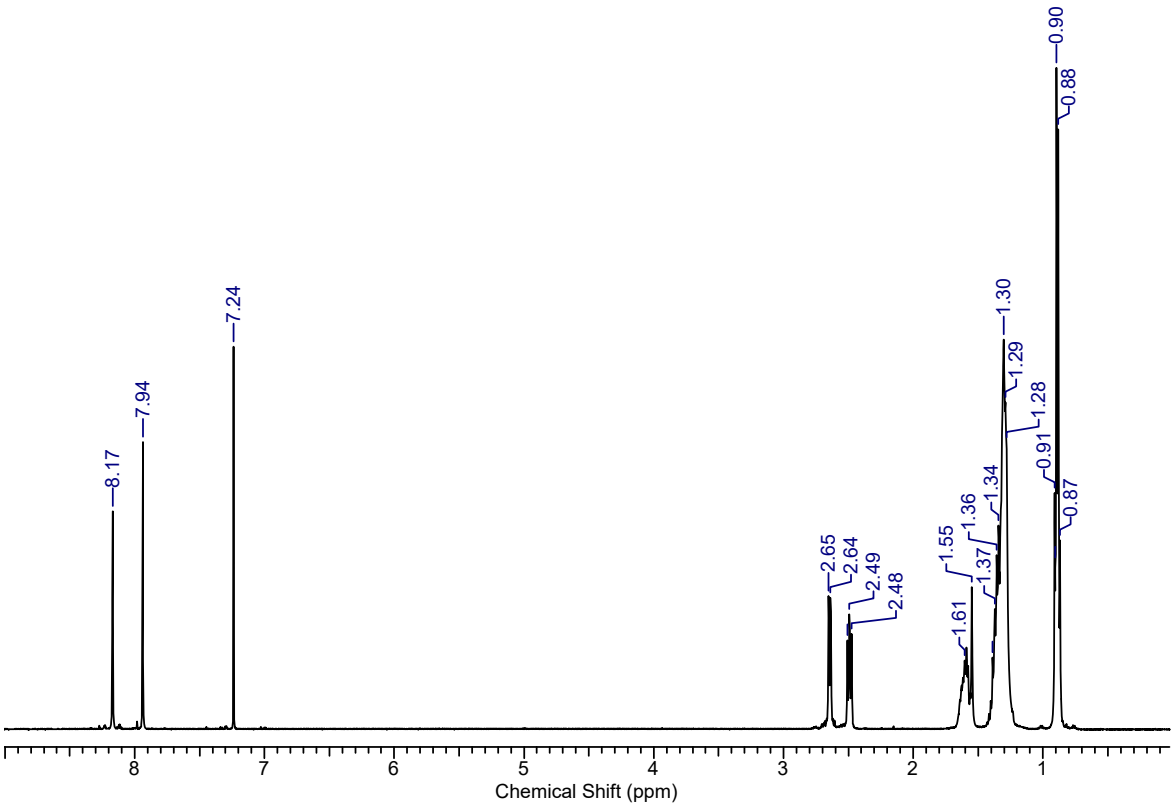

Figure S17. ^{1}H NMR spectrum of compound **M2**

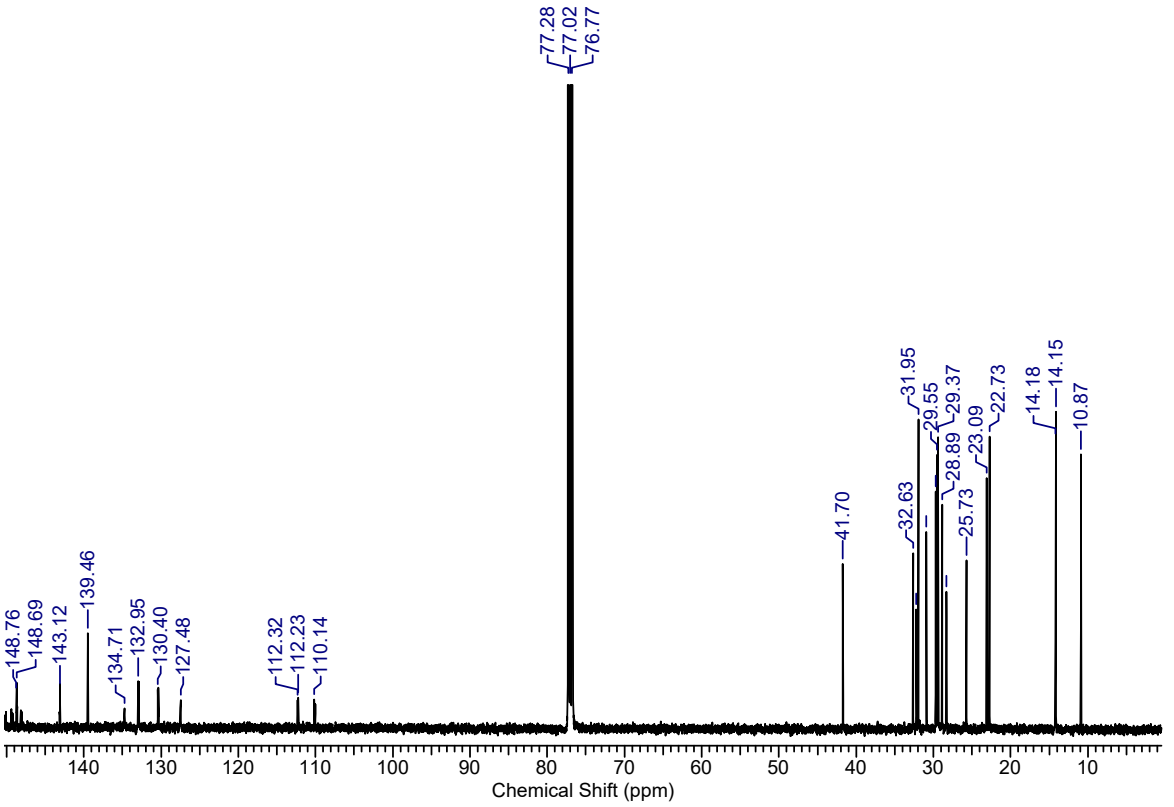

Figure S18. ^{13}C NMR spectrum of compound **M2**

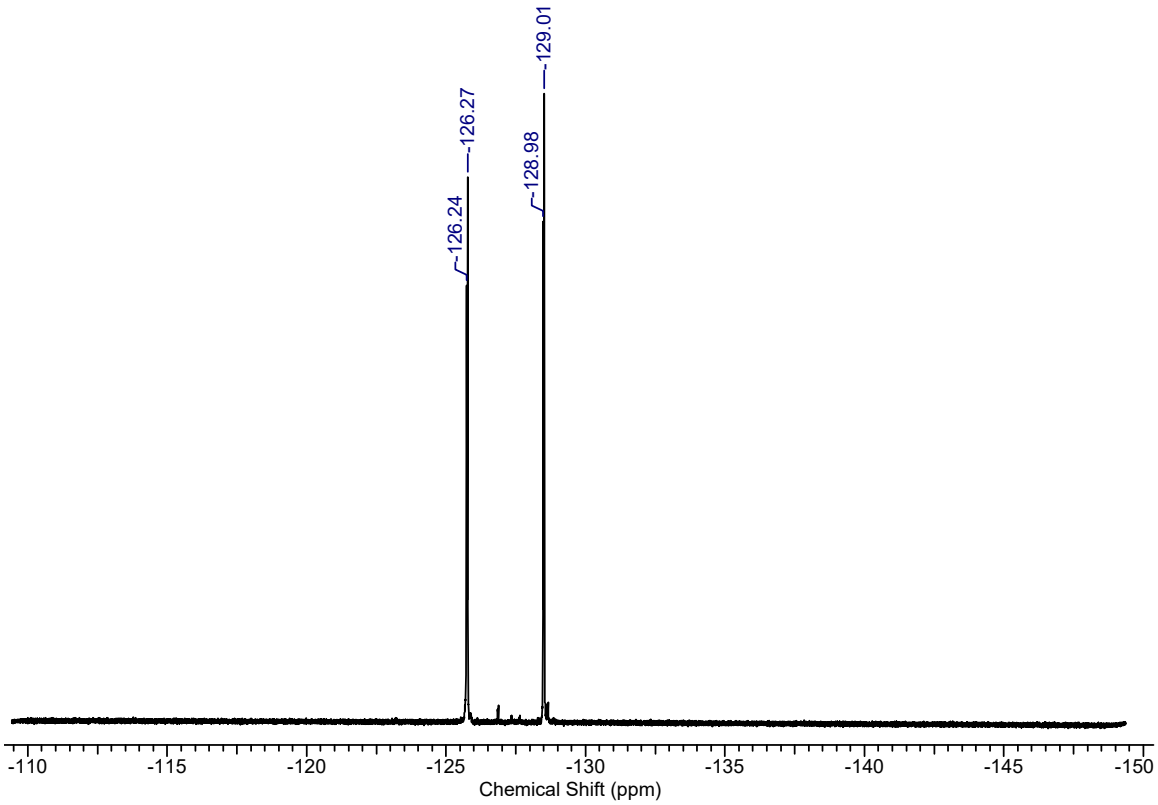

Figure S19. ^{19}F NMR spectrum of compound **M2**

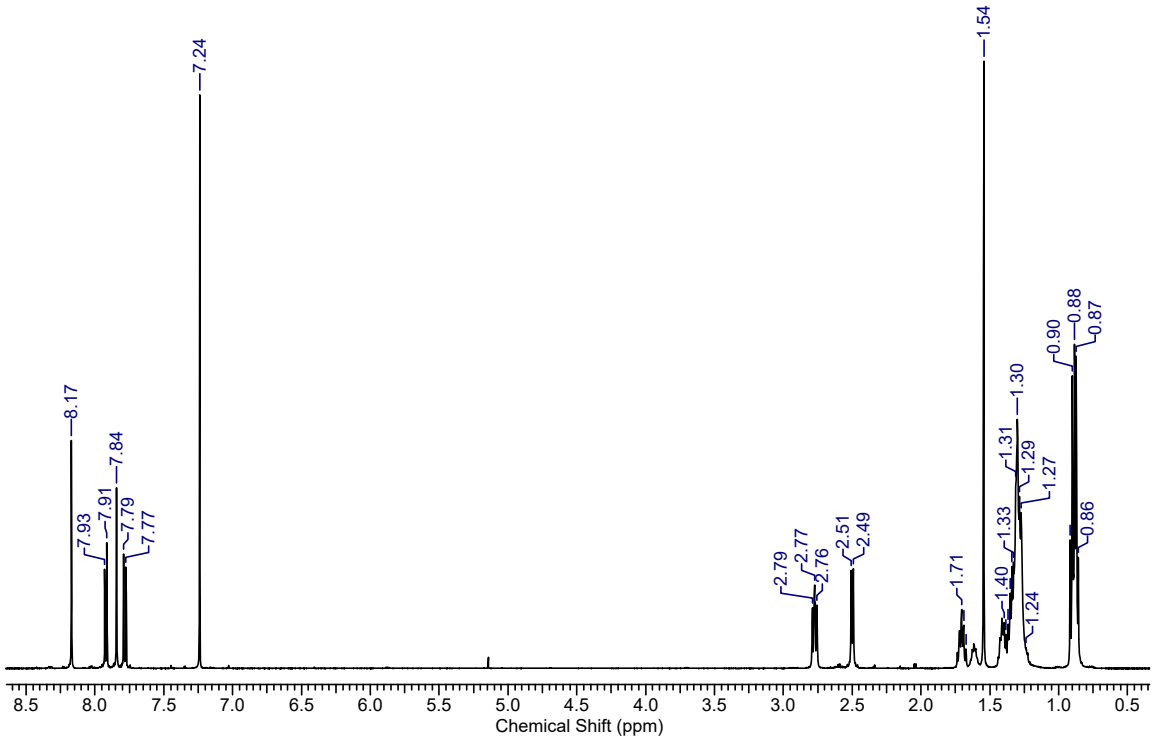

Figure S20. ^{1}H NMR spectrum of compound **M3**

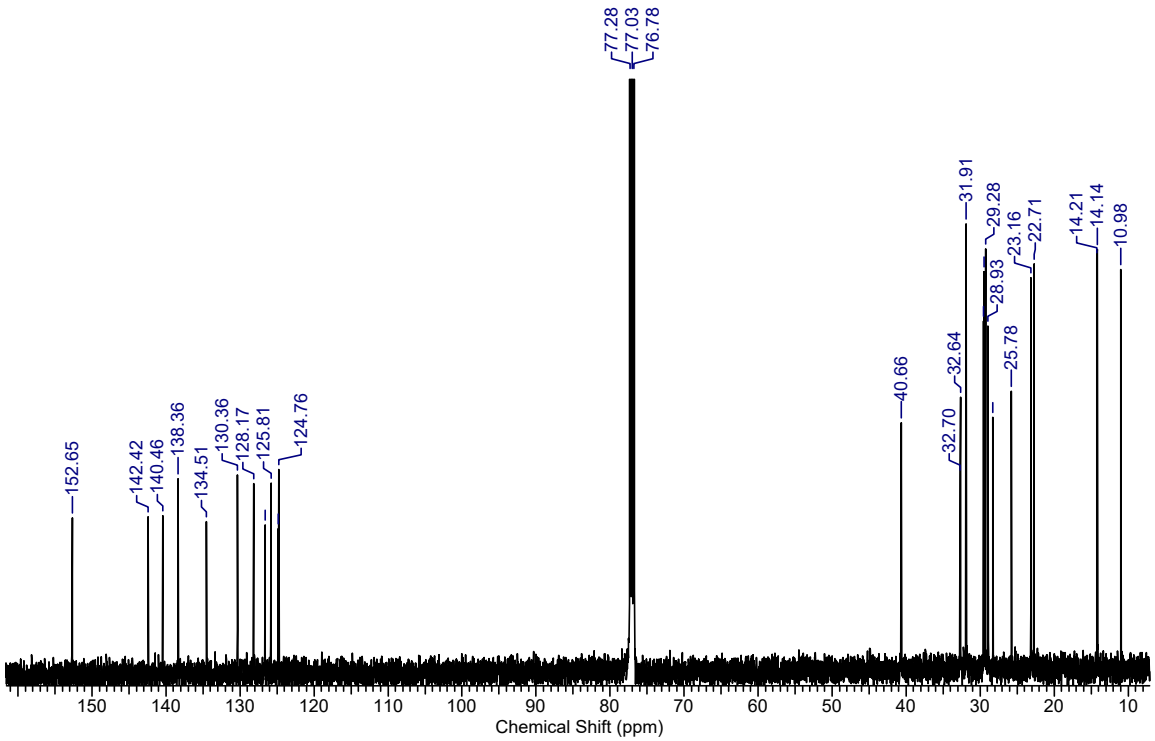

Figure S21. ^{13}C NMR spectrum of compound **M3**

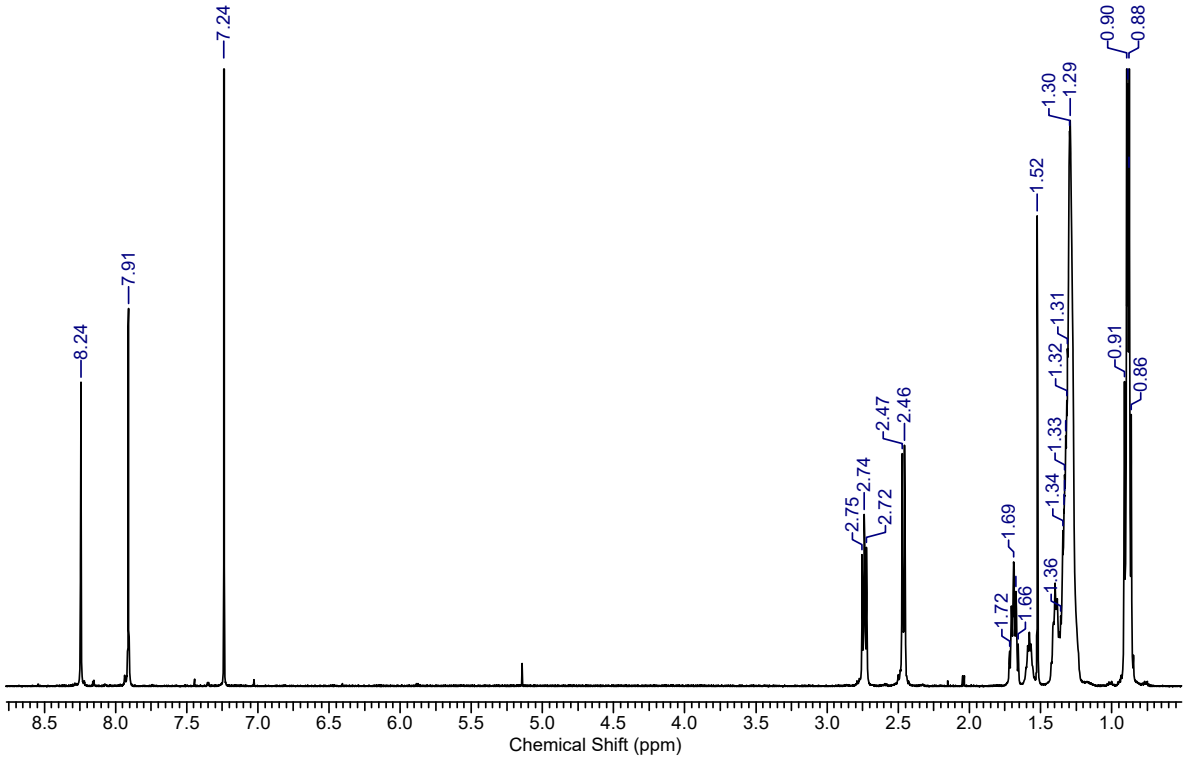

Figure S22. ^{1}H NMR spectrum of compound **M4**

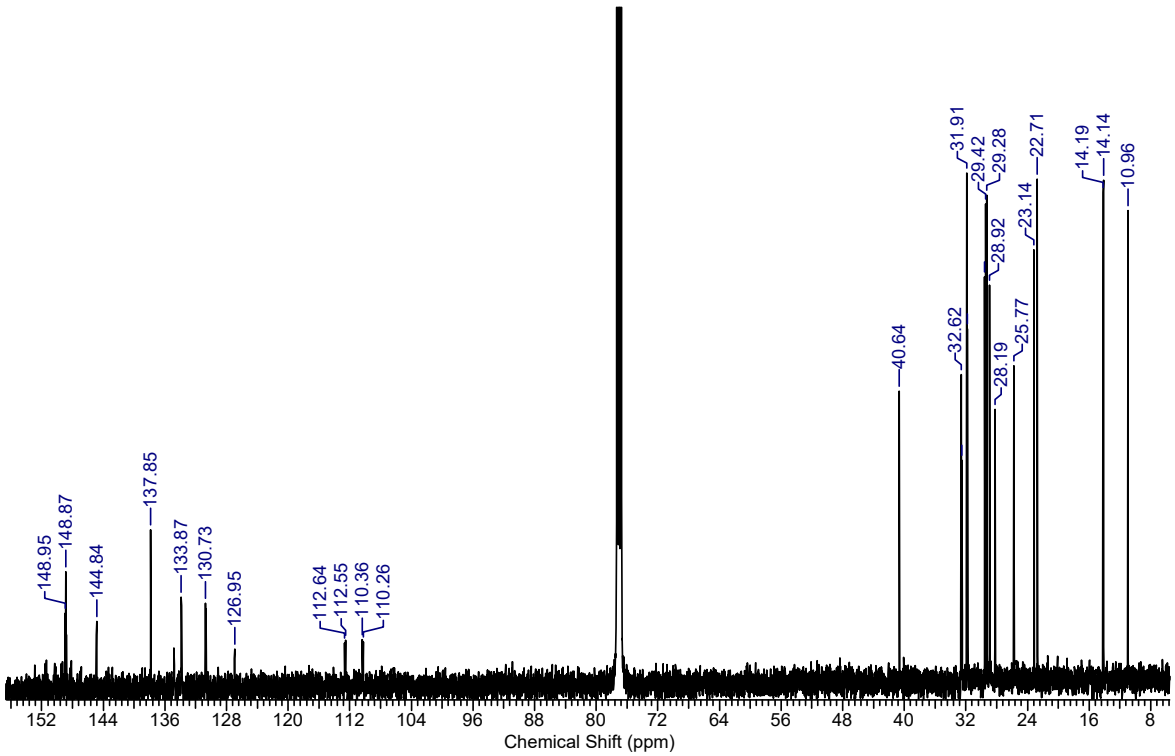

Figure S23. ^{13}C NMR spectrum of compound **M4**

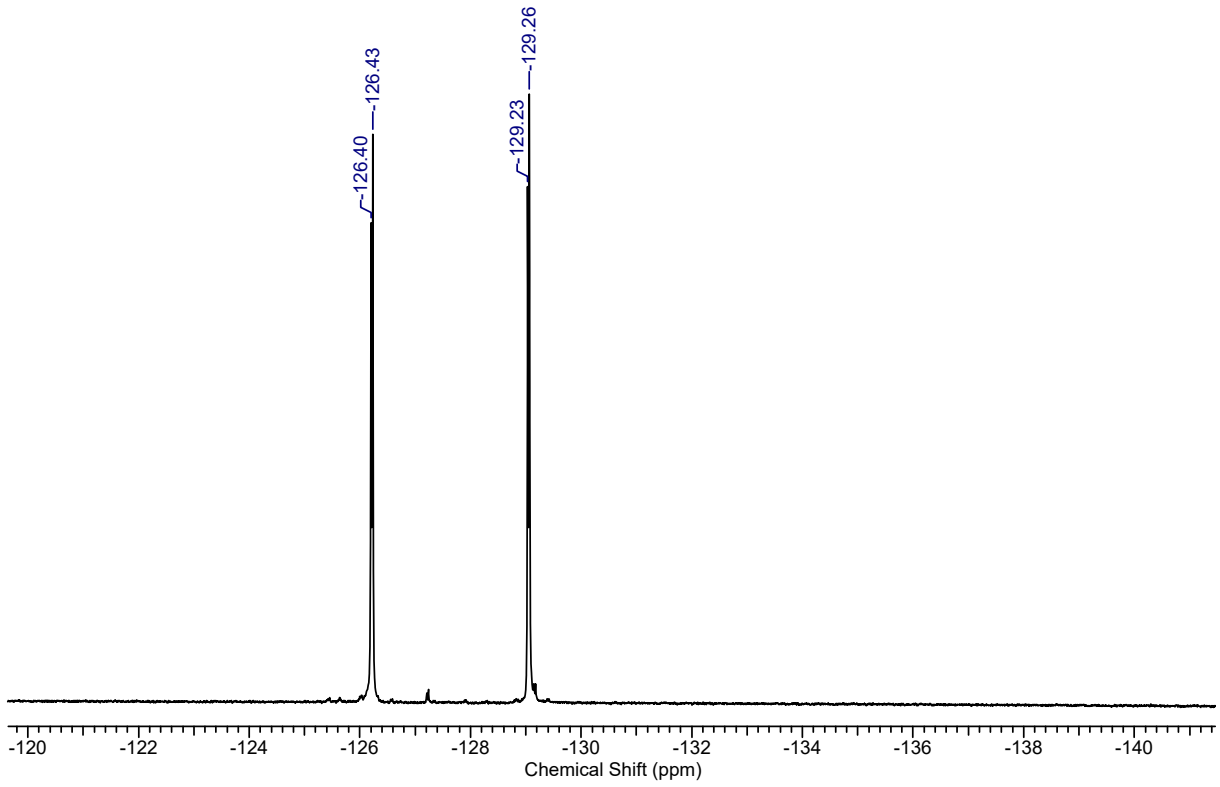

Figure S24. ^{19}F NMR spectrum of compound **M4**

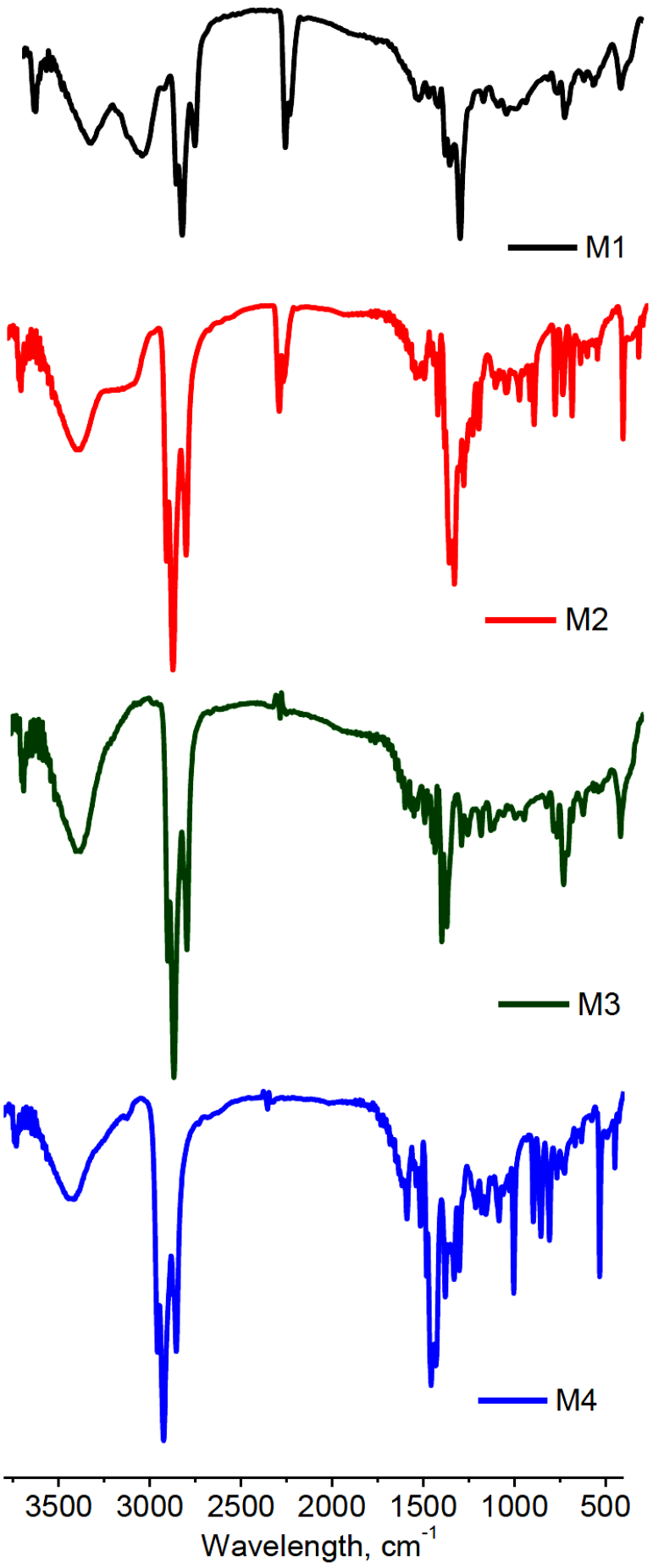

Figure S25. FT-IR spectrum of compounds **M1-M4**

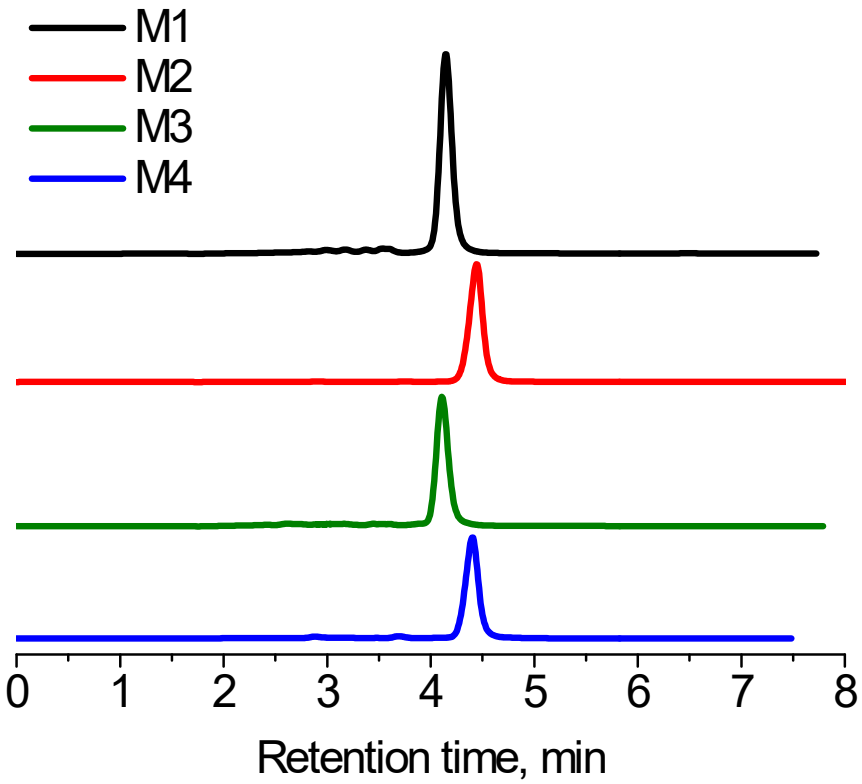

Figure S26. HPLC of compounds **M1-M4**.Conditions: eluent - acetonitrile:toluene (7:3); flow rate 1 mL/min; temperature 40°C; column - Phenomenex Luna C18, 5µm (4.6 × 150 mm).

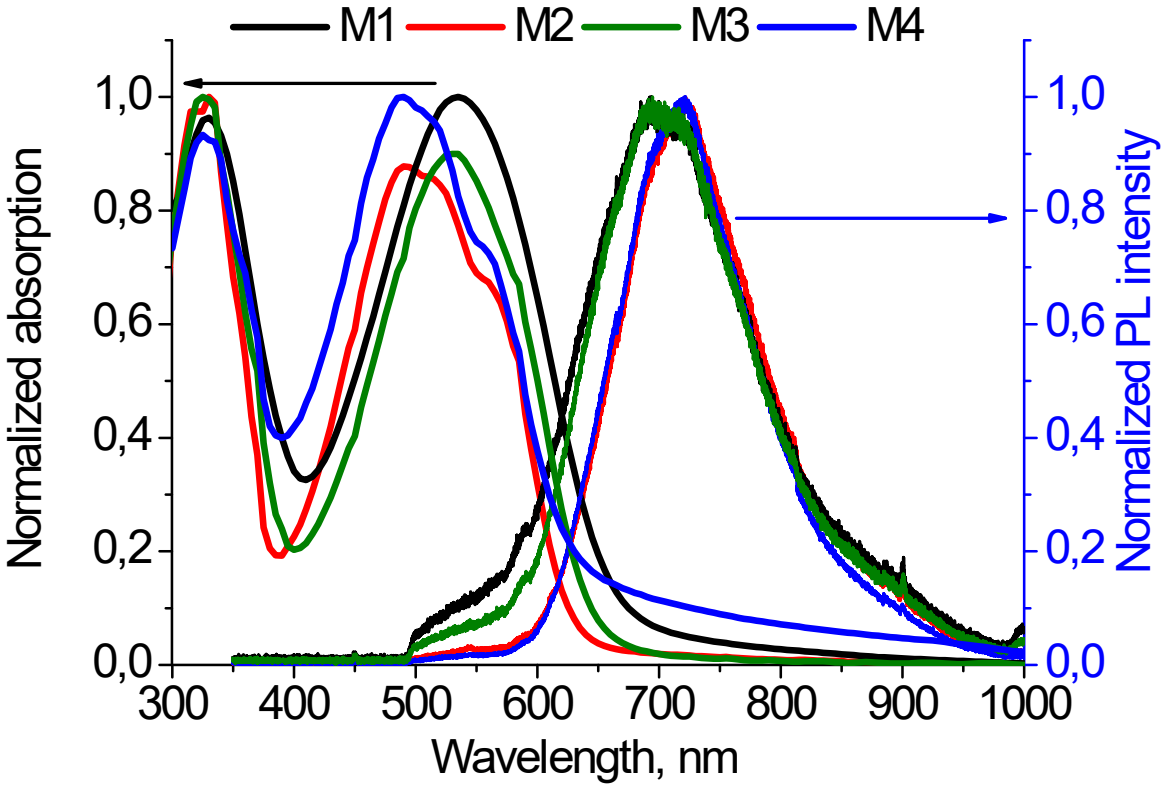

Figure S27. Absorption and fluorescence spectra of the compounds **M1-M4** in films normalized relative to their respective dominant bans.

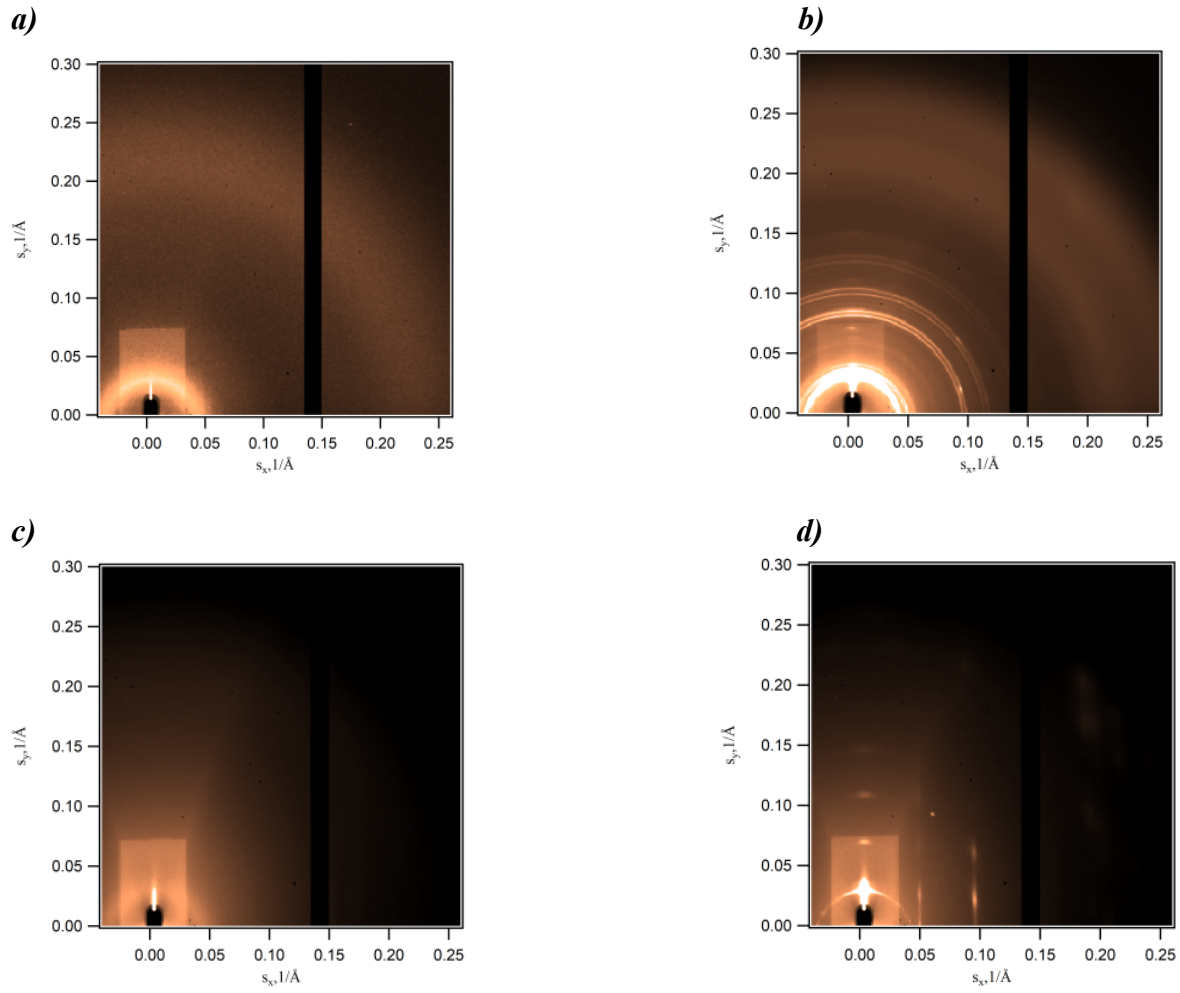

Figure S28. 2D GIWAXS patterns of **M1** ***(a)***, **M2** ***(b)***, **M3** ***(c)*** and **M4** ***(d)*** at 120°C

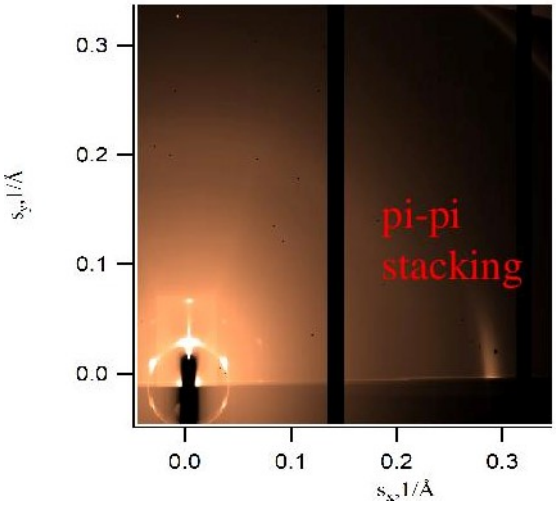

Figure S29. Full 2D GIWAXS pattern of **M3**

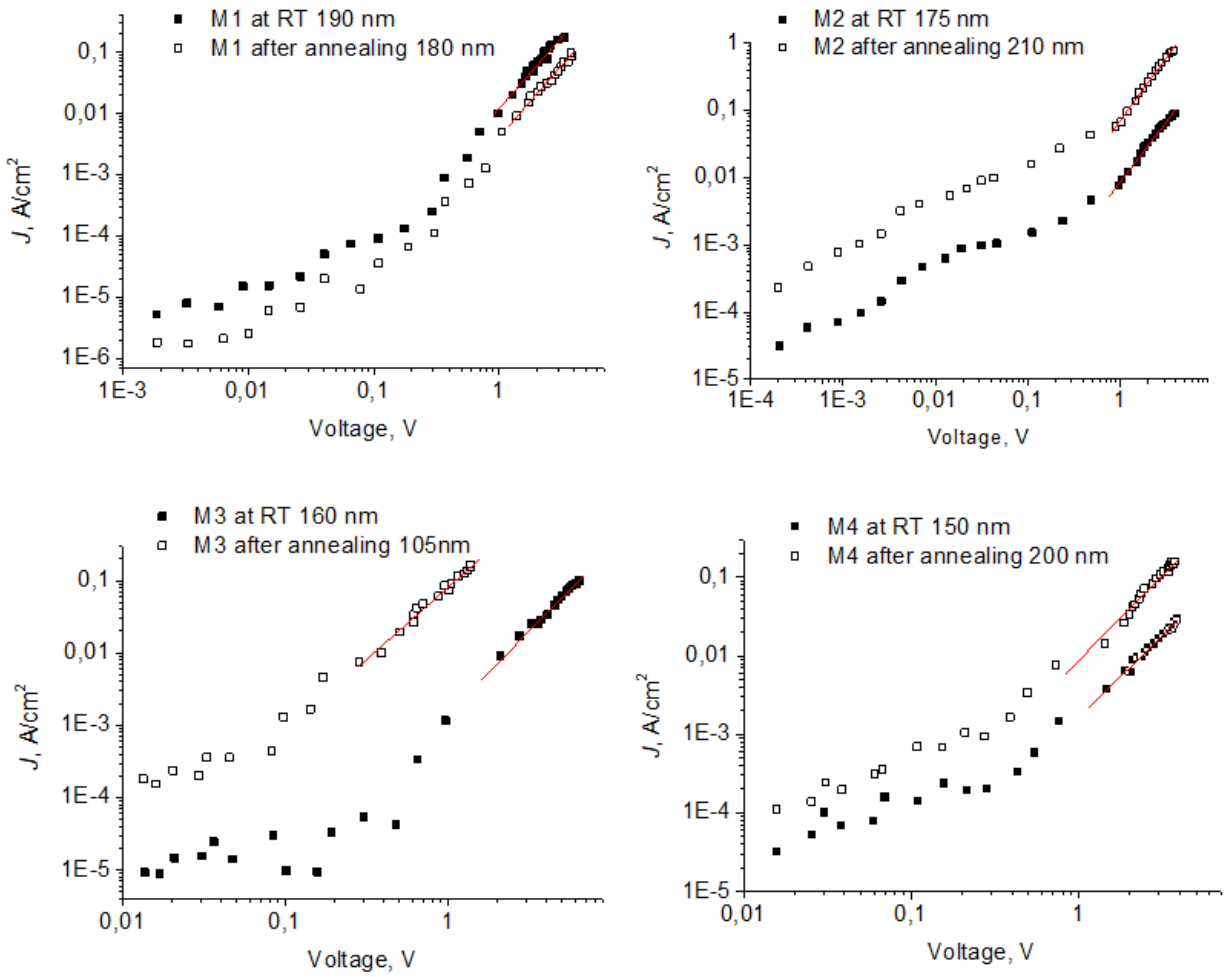

Figure S30. *J*-V curves of hole-only devices based on compounds **M1**-**M4** (solid points for as-cast films and empty points for annealed films at 120°C). The red lines represent the best fitting from space charge limited current model.