Electronic Supplementary Material (ESI) for Polymer Chemistry.

Polymer defect engineering – conductive 2D organic platelets from precise thiophene-doped polyethylene

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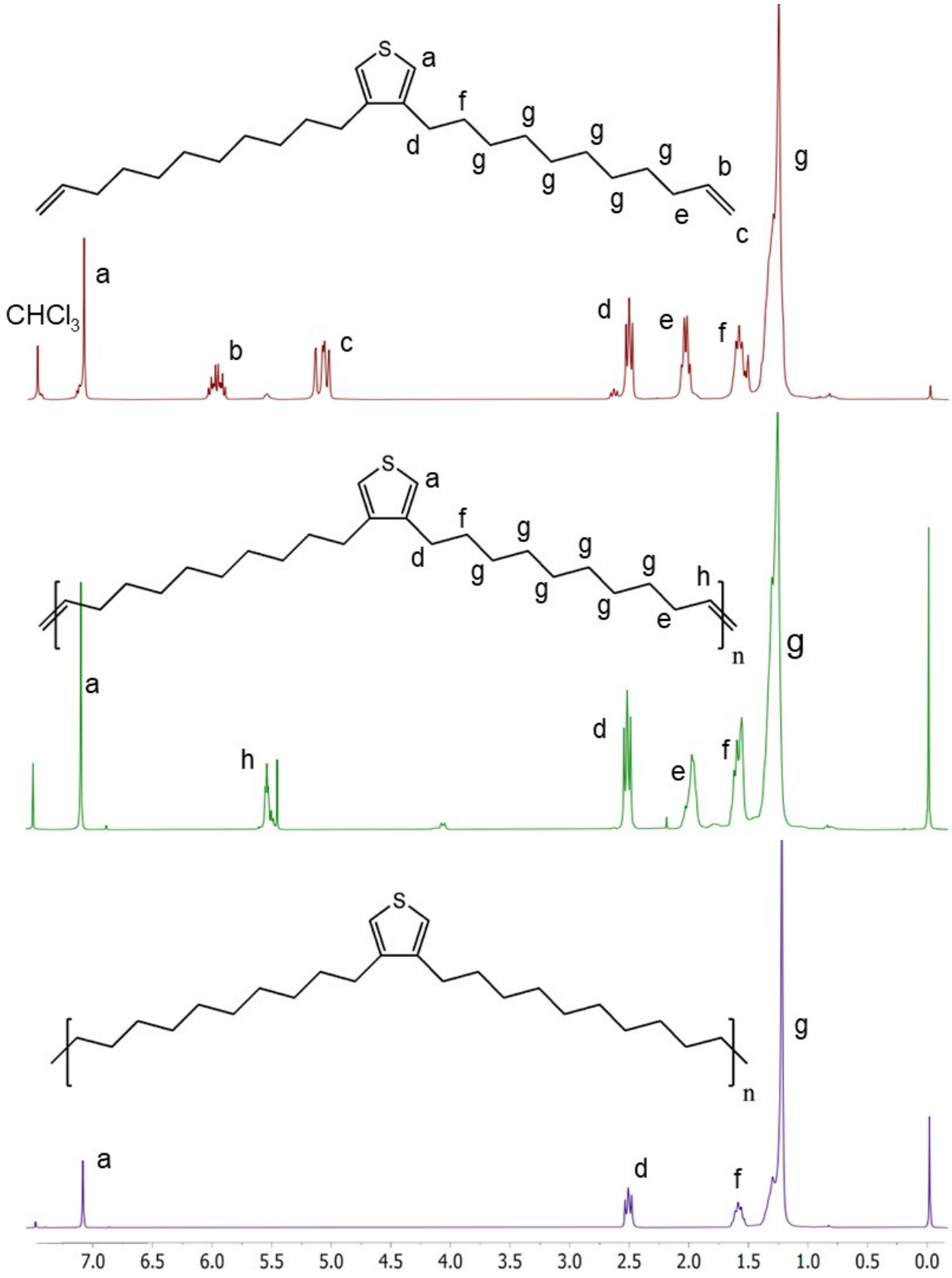


Figure S1. ^{1}H NMR spectra of **TH20-m, TH20 and TH20-H**

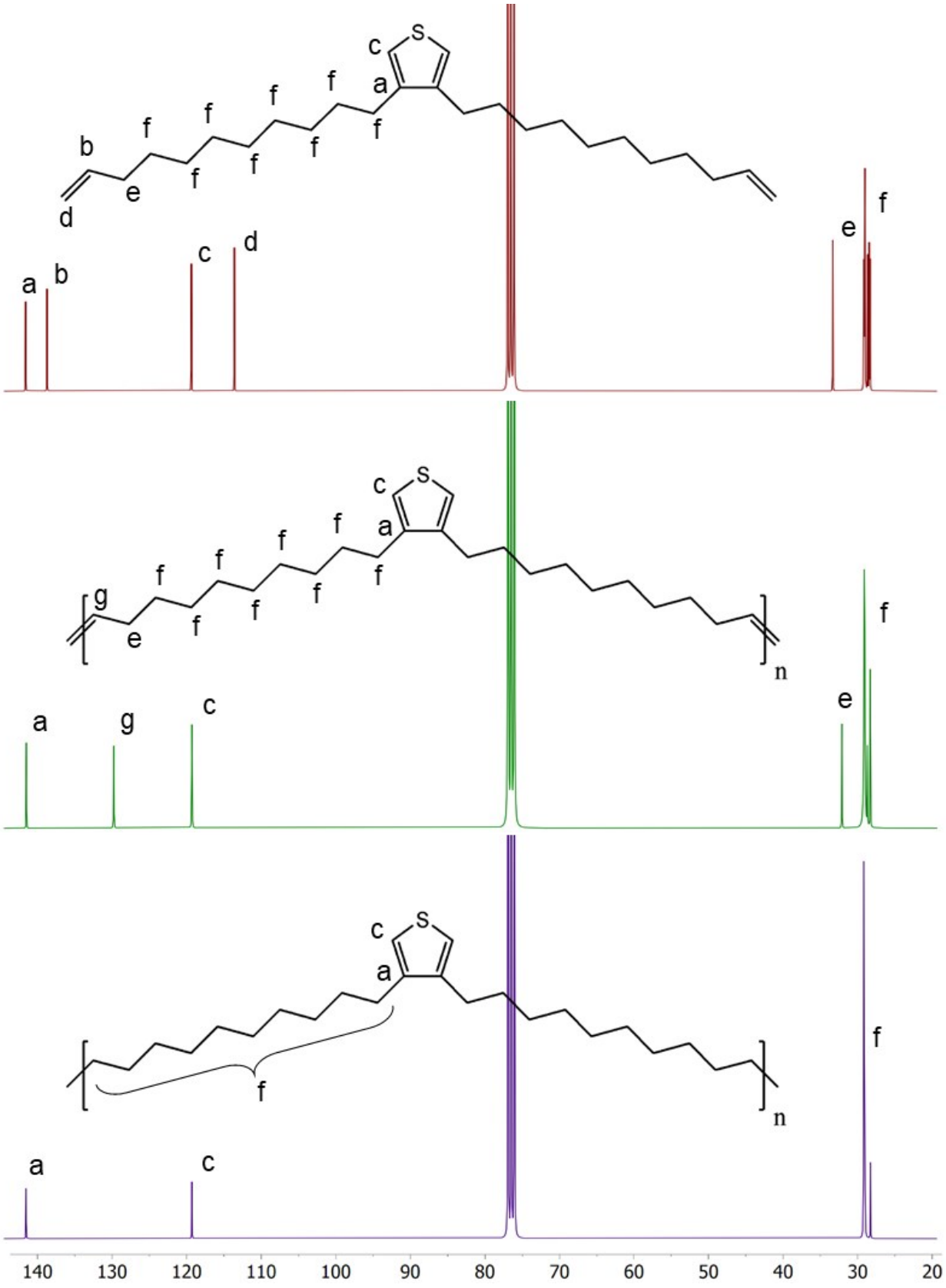


Figure S2. ^{13}C NMR spectra of **TH20-m, TH20 and TH20-H**

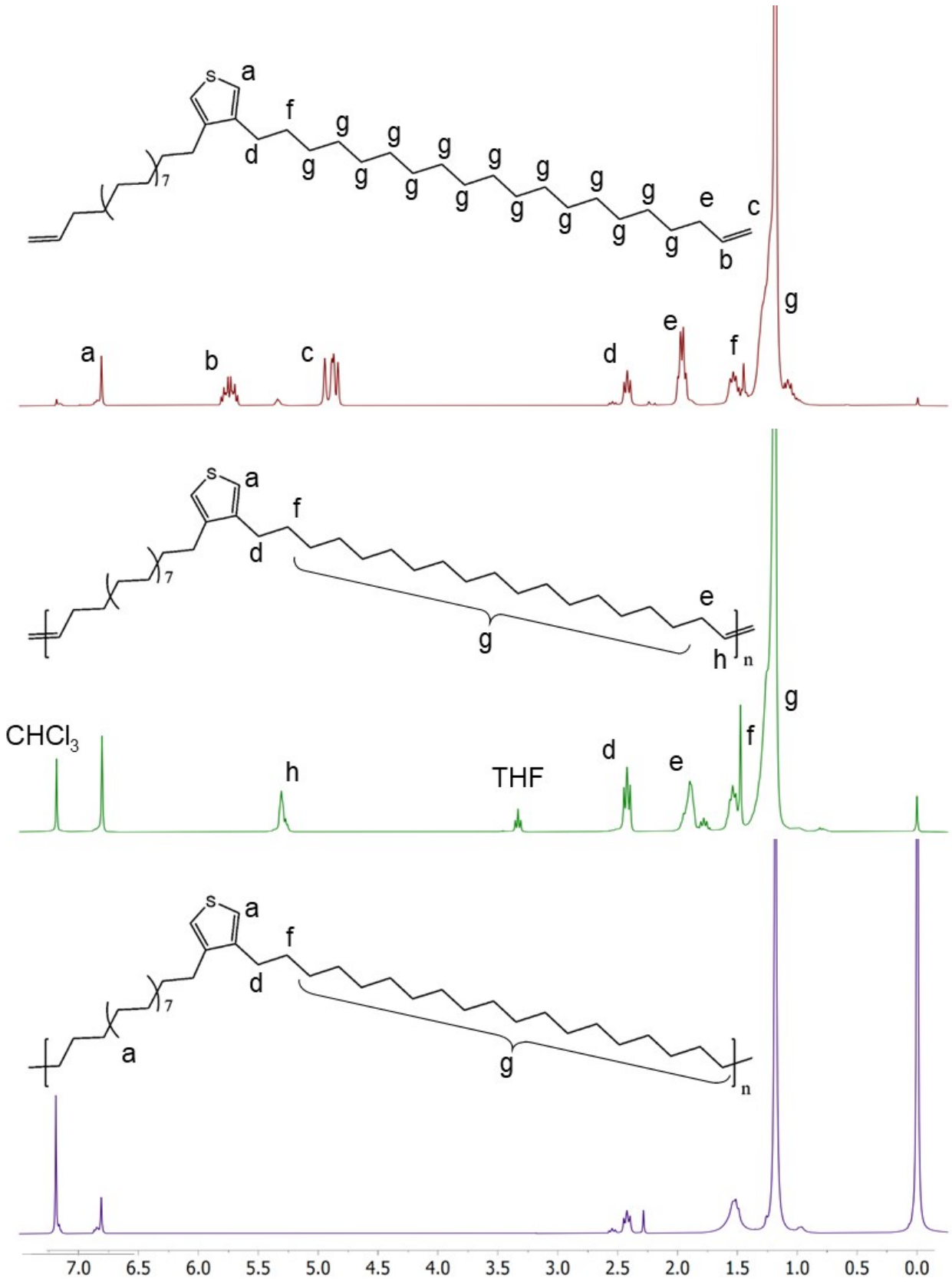


Figure S3. ^{1}H NMR spectra of **TH38-m, TH38 and TH38-H**

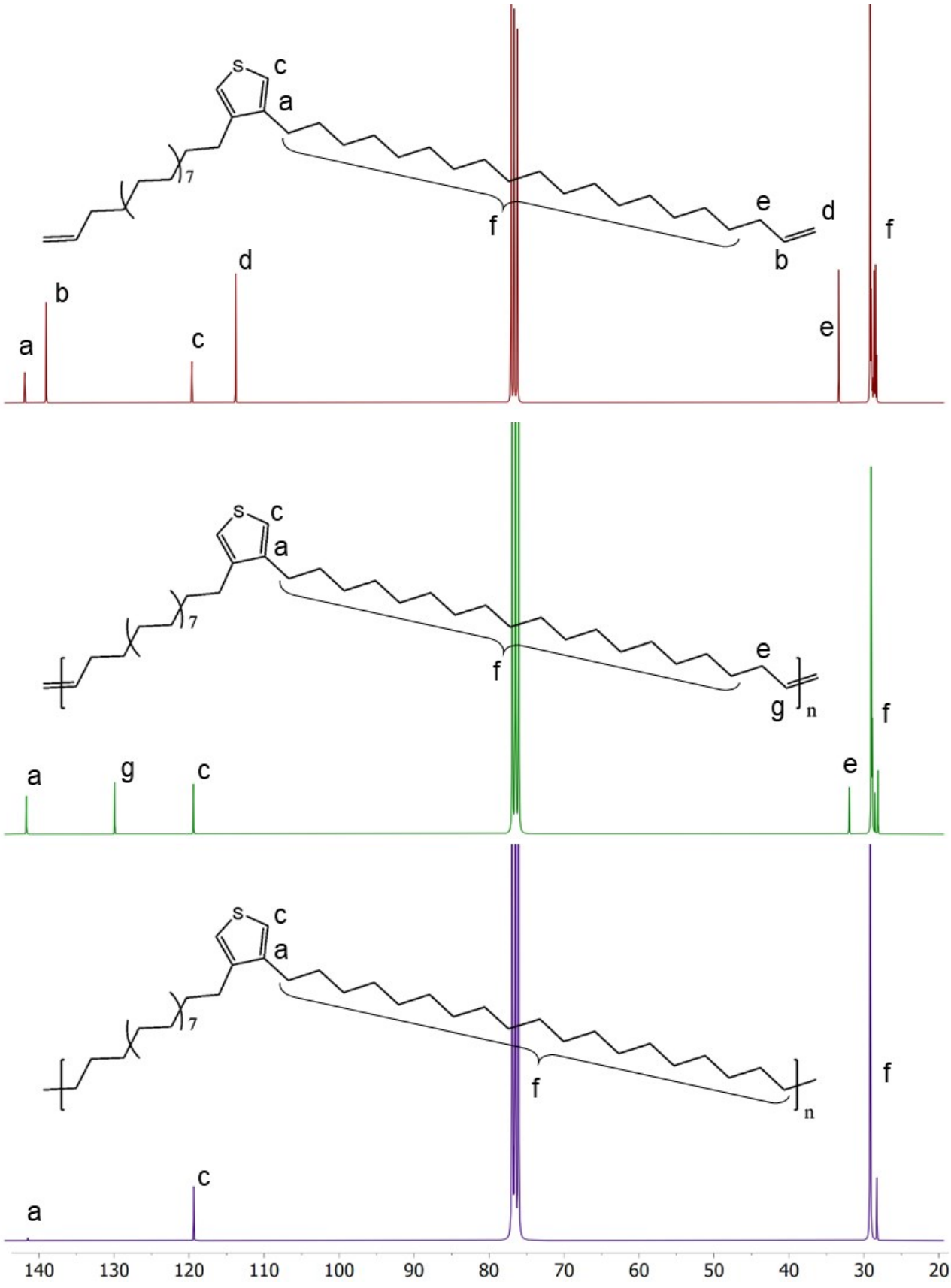


Figure S4. ^{13}C NMR spectra of **TH38-m, TH38 and TH38-H**

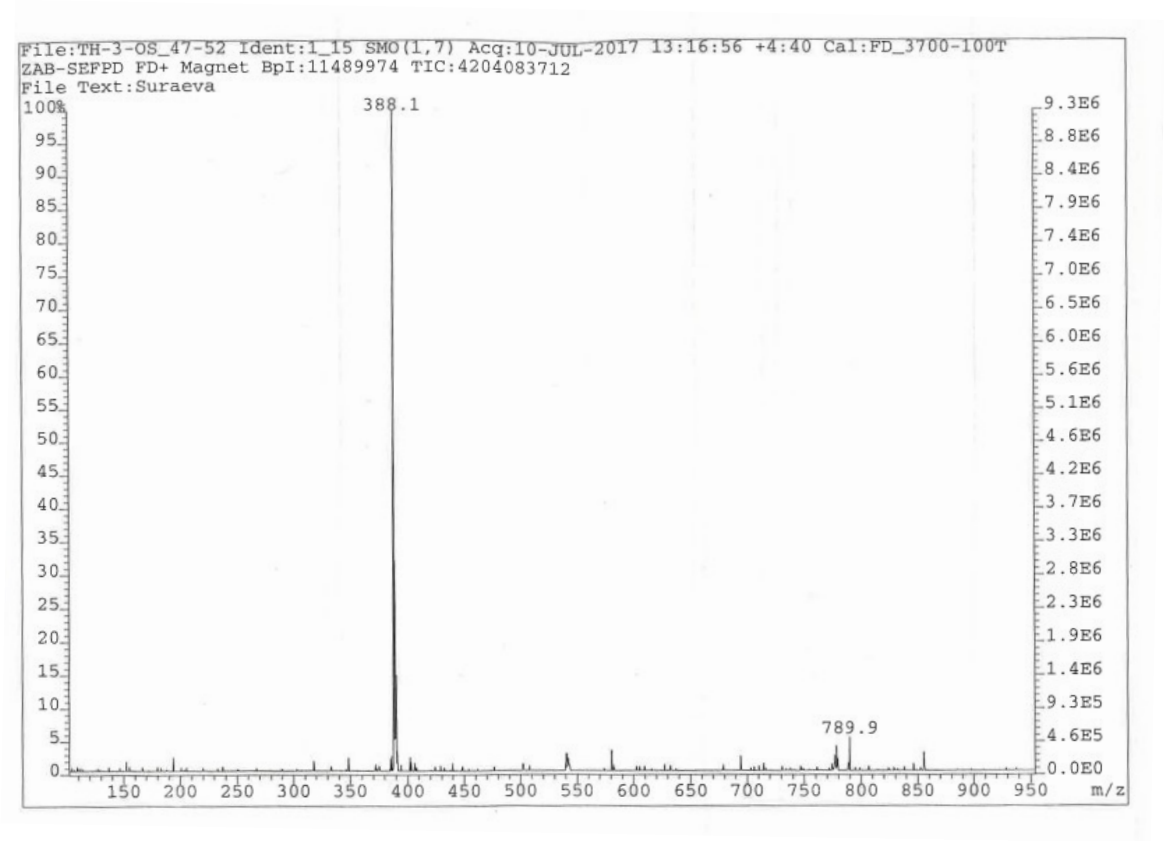
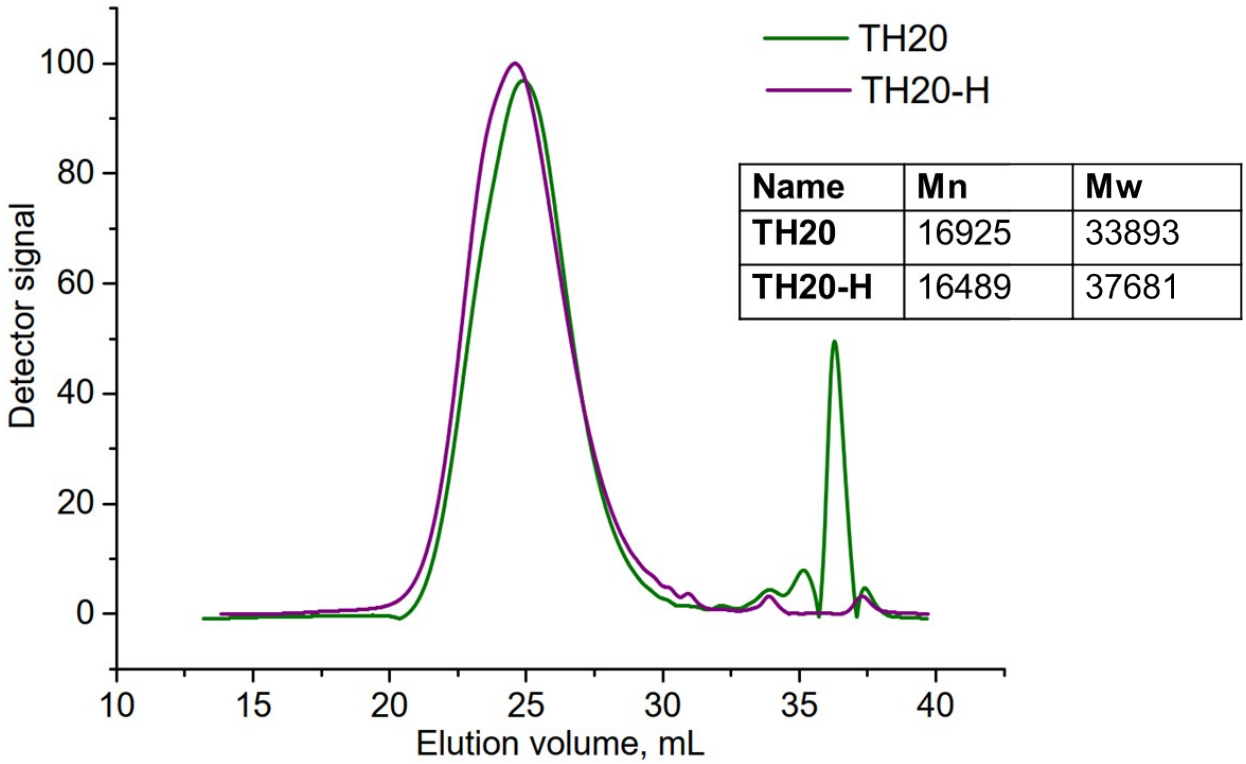


Figure S5. Mass-spectrum of monomer TH20-m



Name	Mn	Mw
TH20	16925	33893
TH20-H	16489	37681

Figure S6. GPC curves of unsaturated polymer TH20 (green), and polymer TH20-H (purple) after hydrogenation

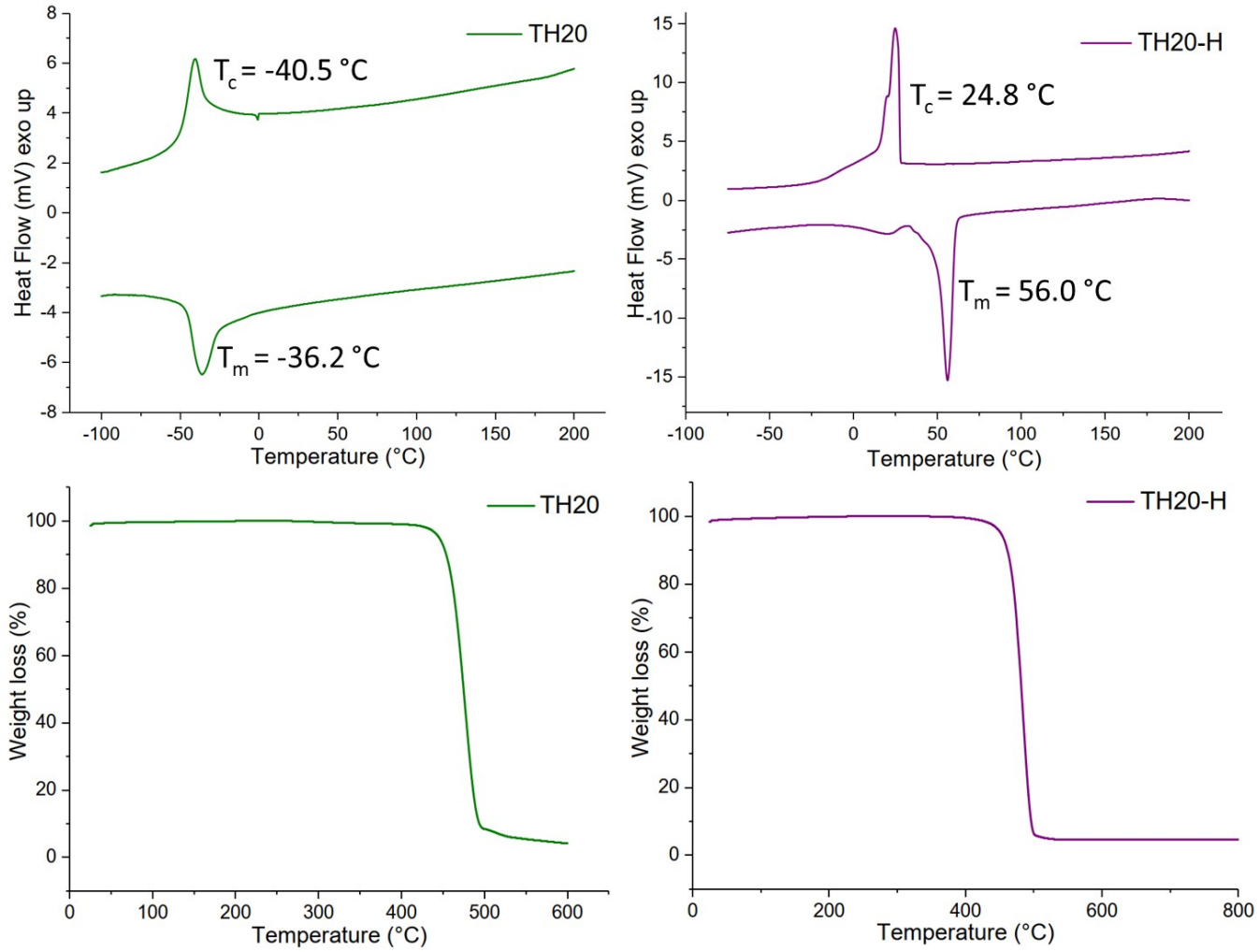


Figure S7. DSC thermograms of unsaturated polymer TH20 and product after hydrogenation TH20-H.

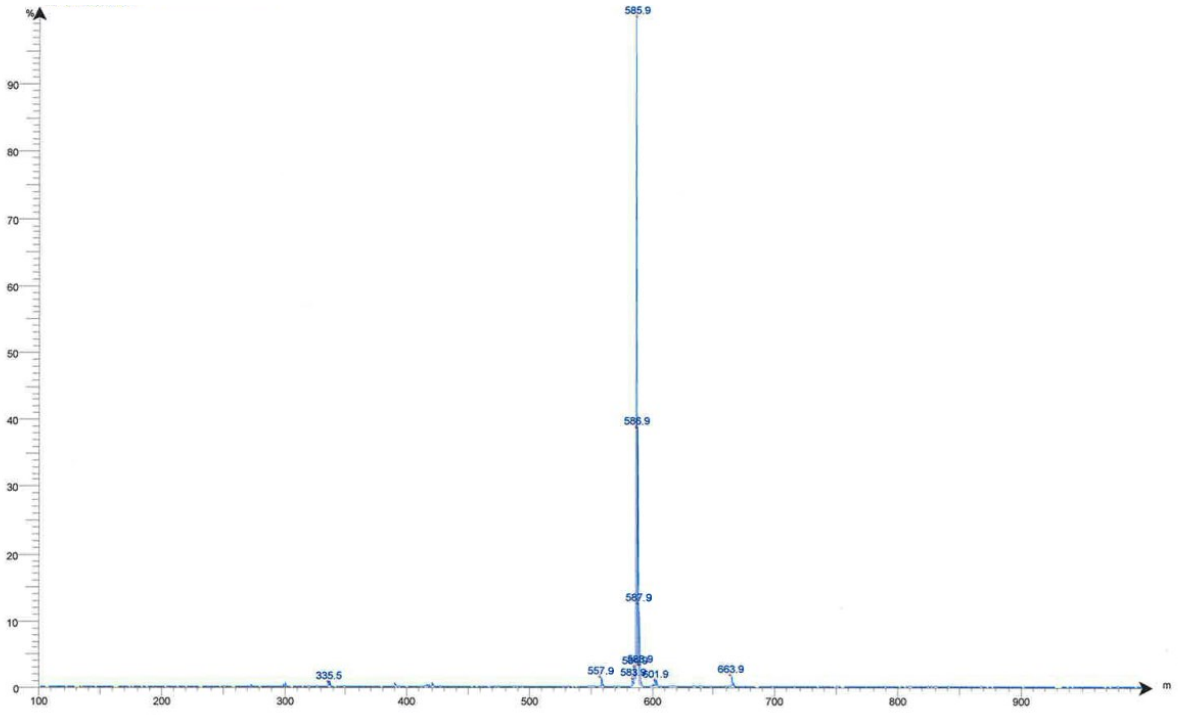
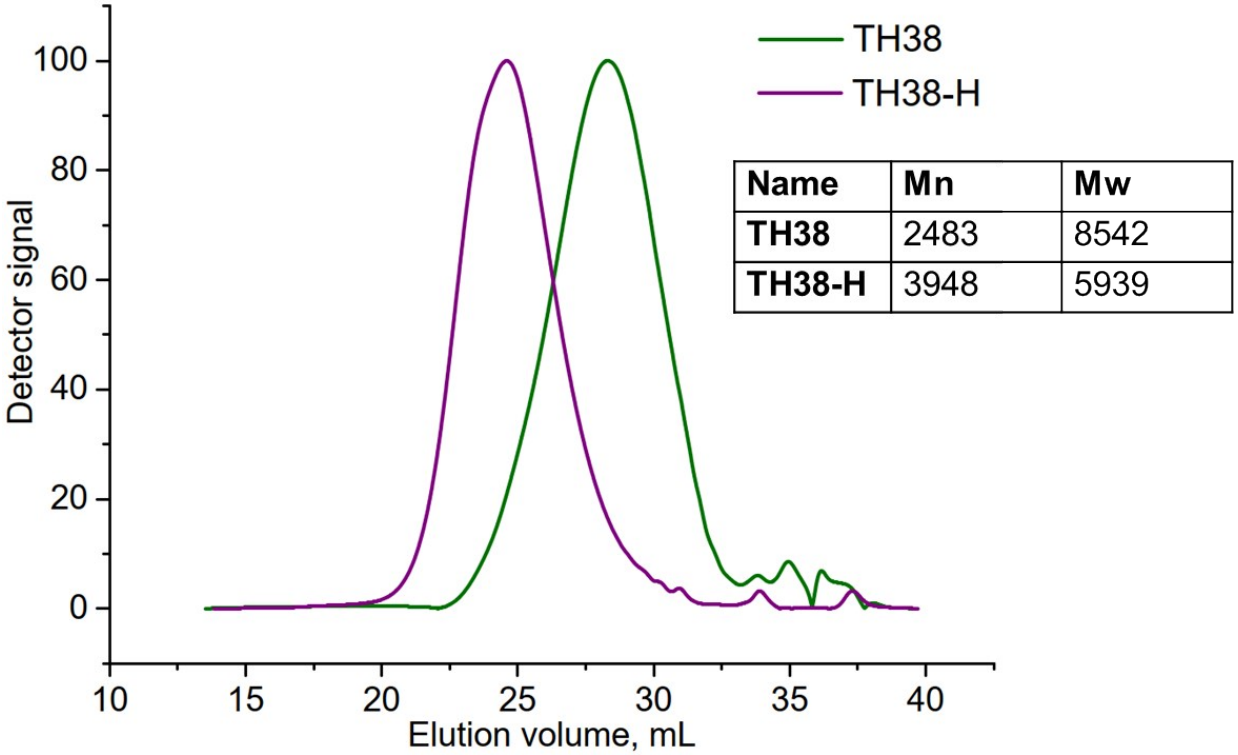


Figure S8. Mass-spectrum of monomer TH38-m



Name	Mn	Mw
TH38	2483	8542
TH38-H	3948	5939

Figure S9. GPC curves of unsaturated polymer TH20 (green), and polymer TH20-H (purple) after hydrogenation

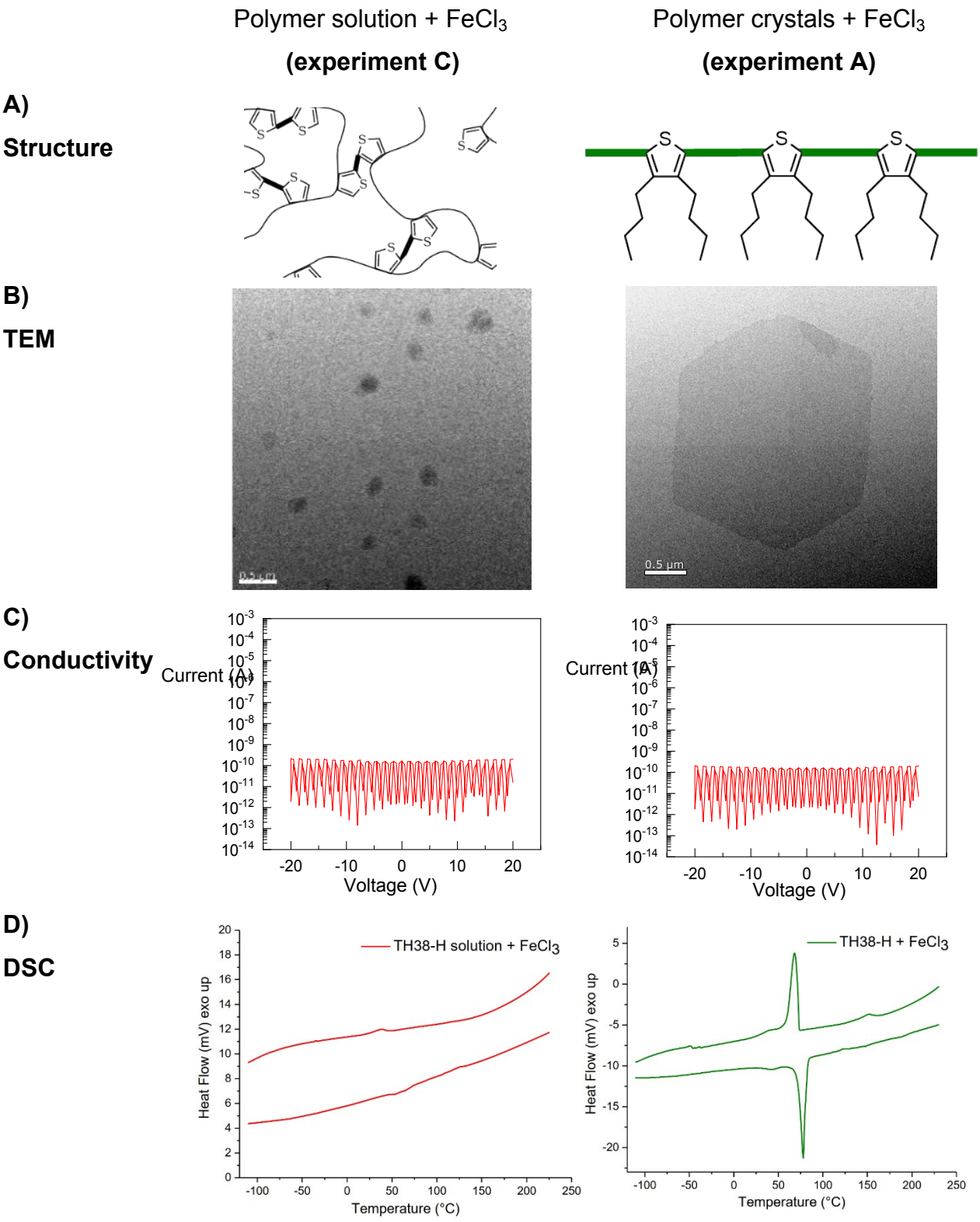


Figure S10. Structure (A), TEM bright-field micrograph (B), conductivity (C) and DSC thermograms (D) of polymer TH38-H after electrochemical polymerization in solution (left) in crystal state (right)

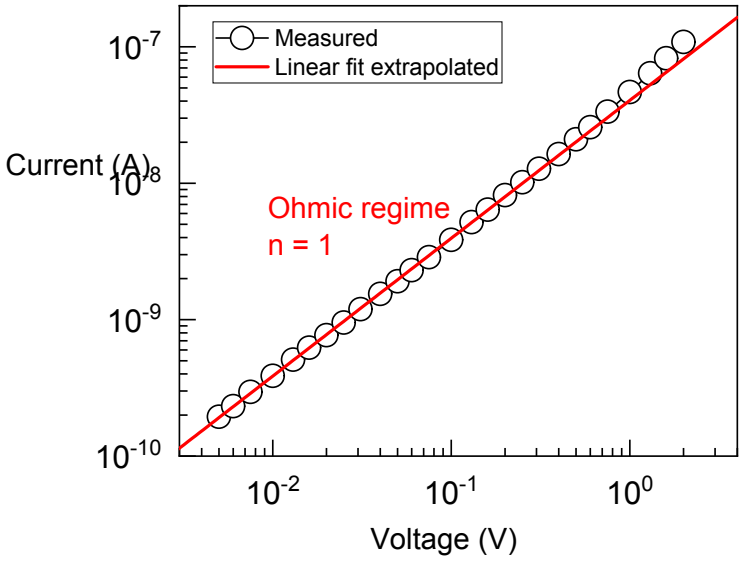


Figure S11. Log I-Log V plot at low bias regime to prove Ohmic electrical conduction of the polymer TH38-H after electrochemical polymerization in crystal state with addition of EDOT

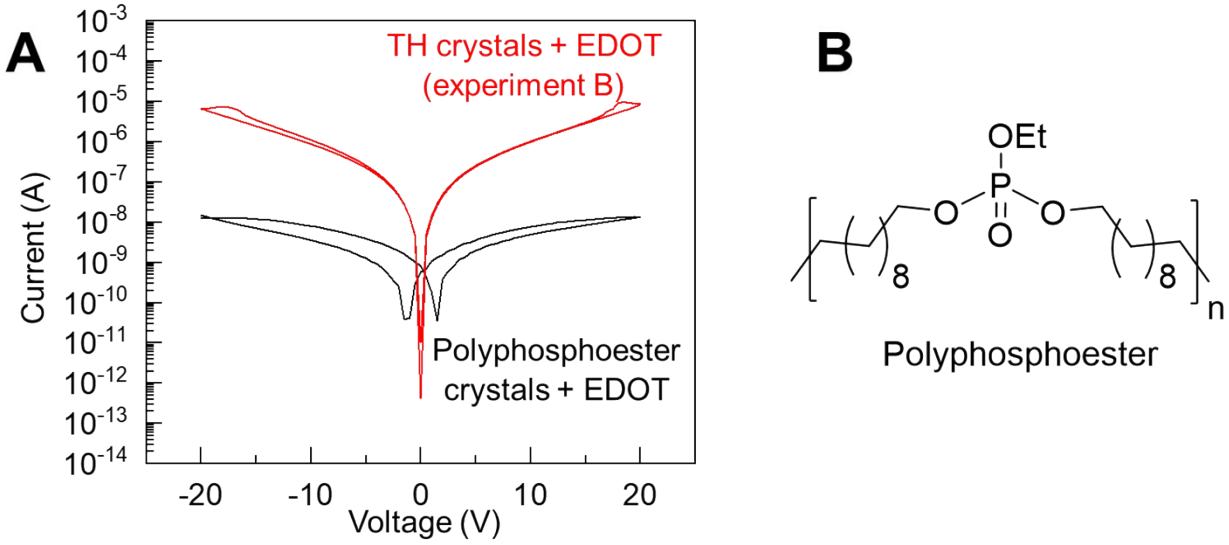


Figure S12. (A) "Negative control" experiment. Polyphosphoester crystals after reaction with EDOT in the presence of $FeCl_3$ (black curve) do not reveal conductivity compare to thiophene crystals with conductive surface (red curve). (B) Chemical structure of polyphosphoester polymer.