Electronic Supplementary Material (ESI) for Journal of Materials Chemistry
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Pyrroloindacenodithiophene Containing Polymers for Organic Field Effect Transistors and Organic Photovoltaics

Electronic Supporting Information

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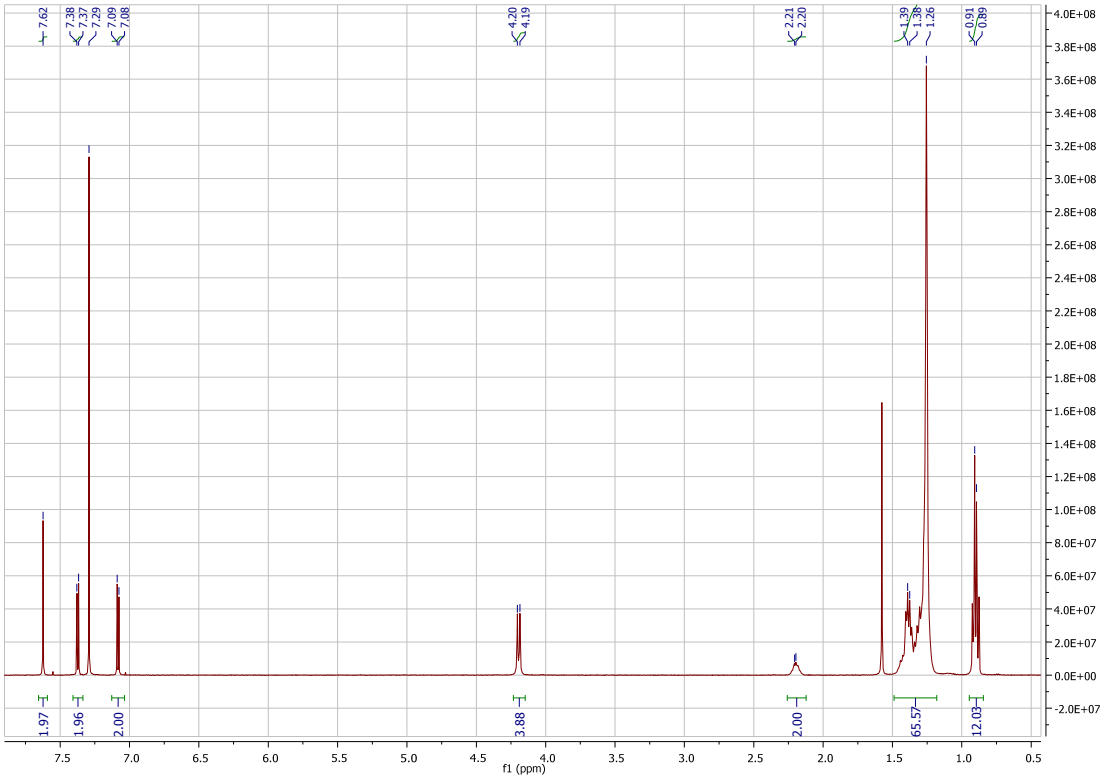
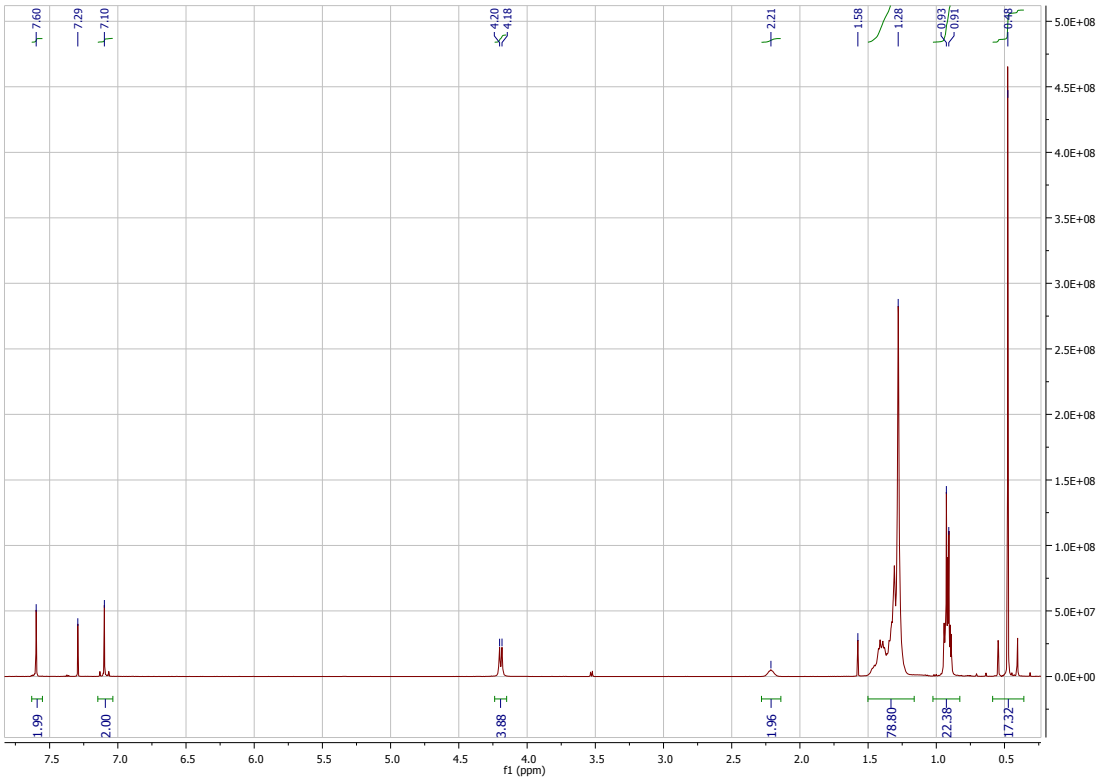
^{1}H NMR Spectra

Benzo[1,2-*b*:4,5-*b*]bis(4-(2-octyl-1-dodecyl)-4*H*-amino[3,2-*b*]thiophene) (NIDT)



Benzo[1,2-*b*:4,5-*b*]bis(2-trimethylstannyl-4-(2-octyl-1-dodecyl)-4*H*-amino[3,2-*b*]thiophene)



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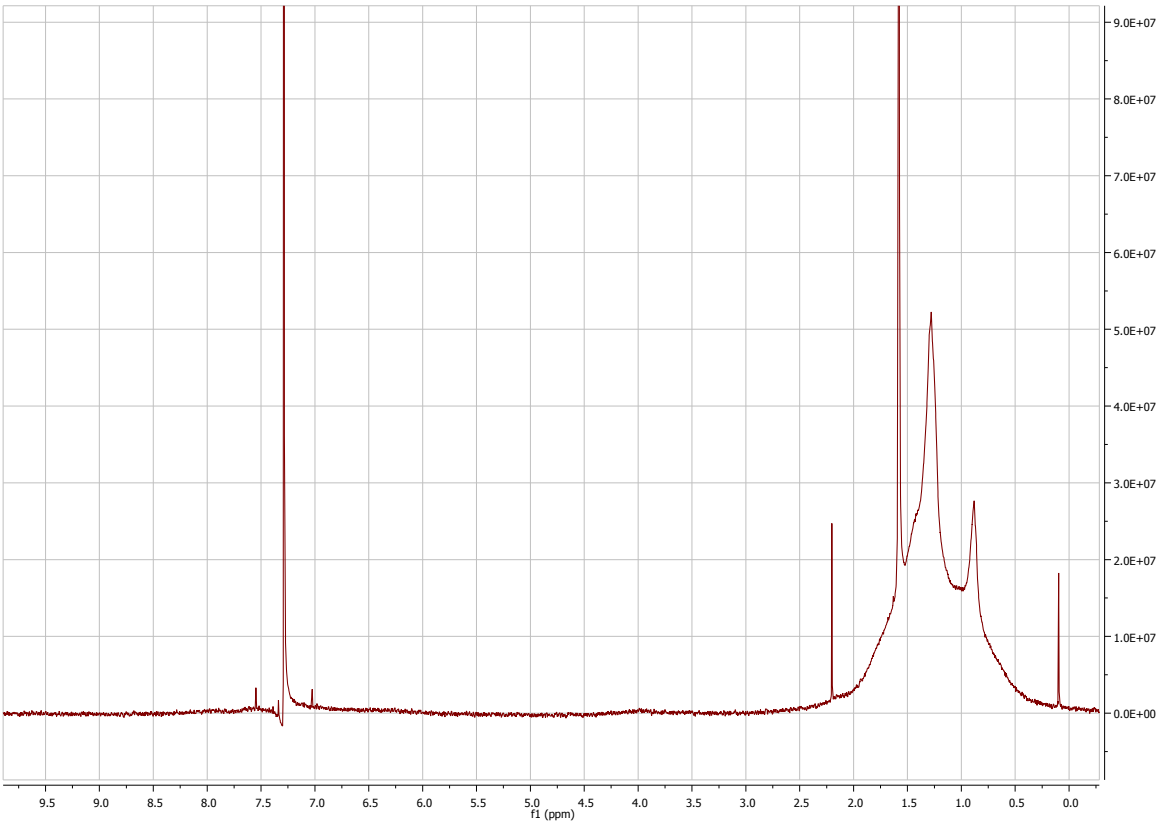
P1



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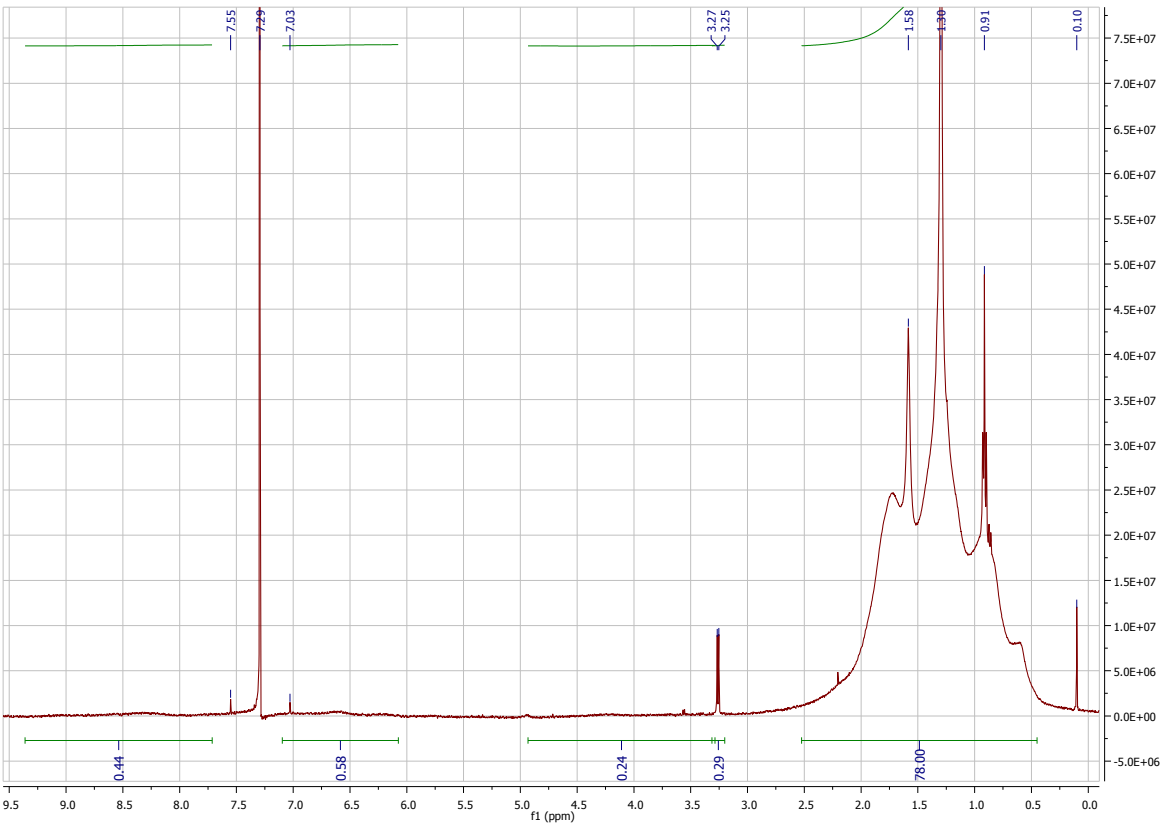

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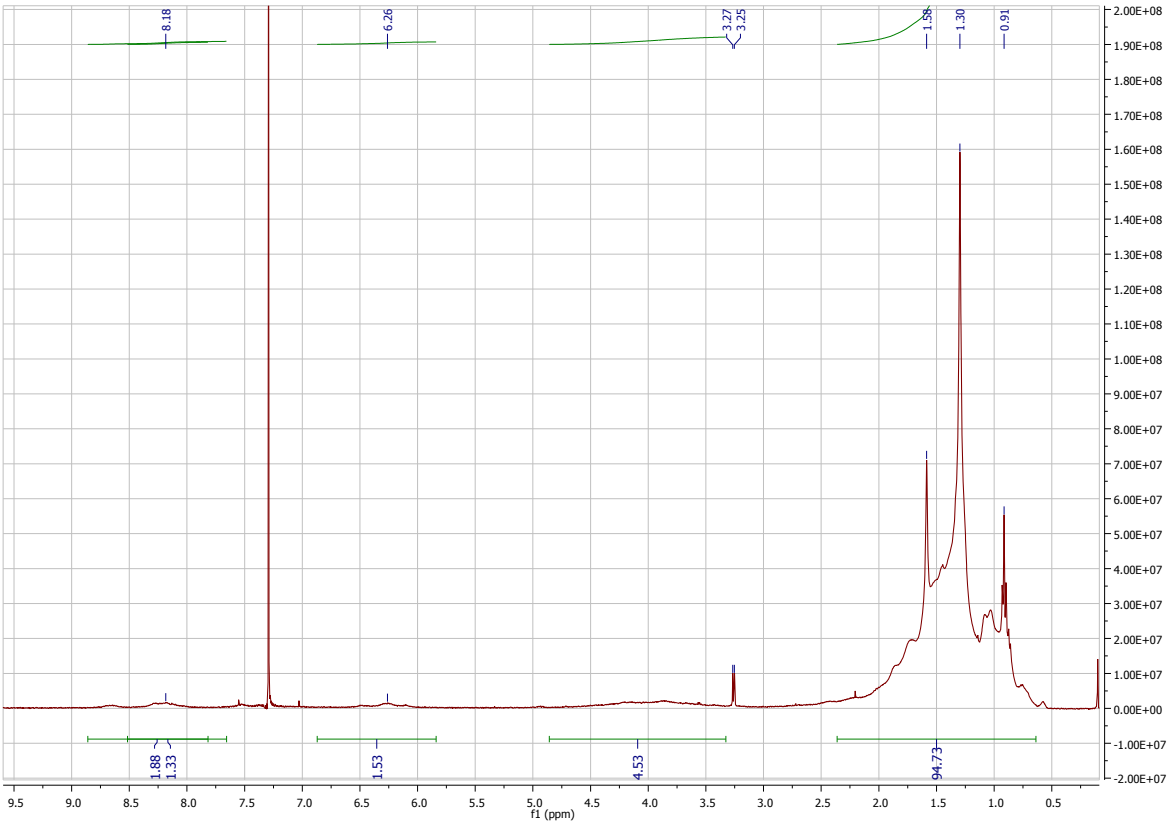
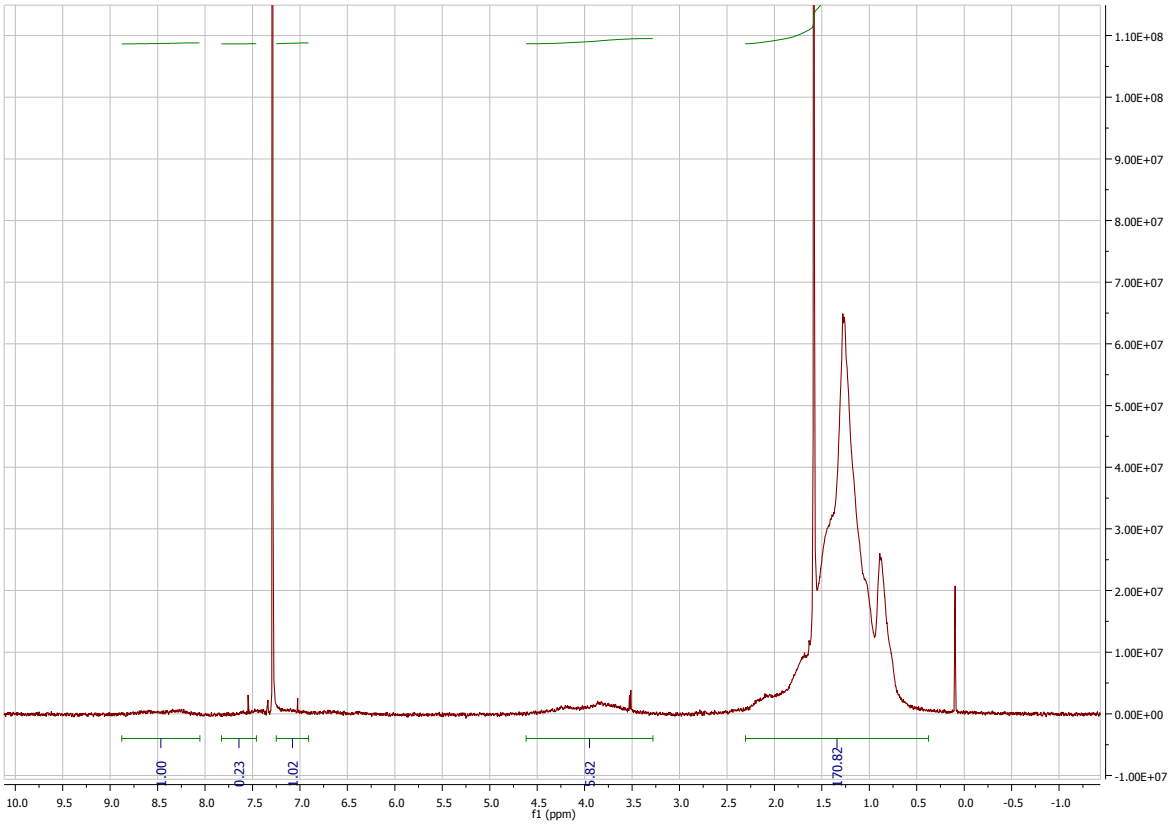


P4



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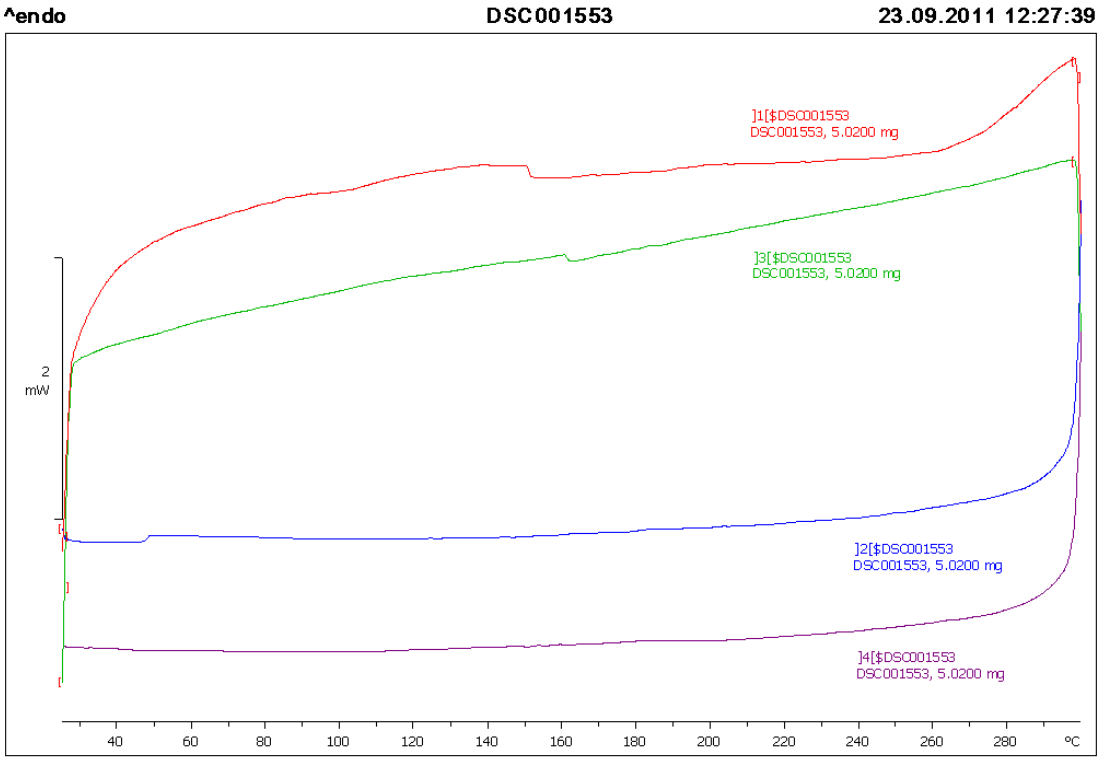
DSC curves

P1



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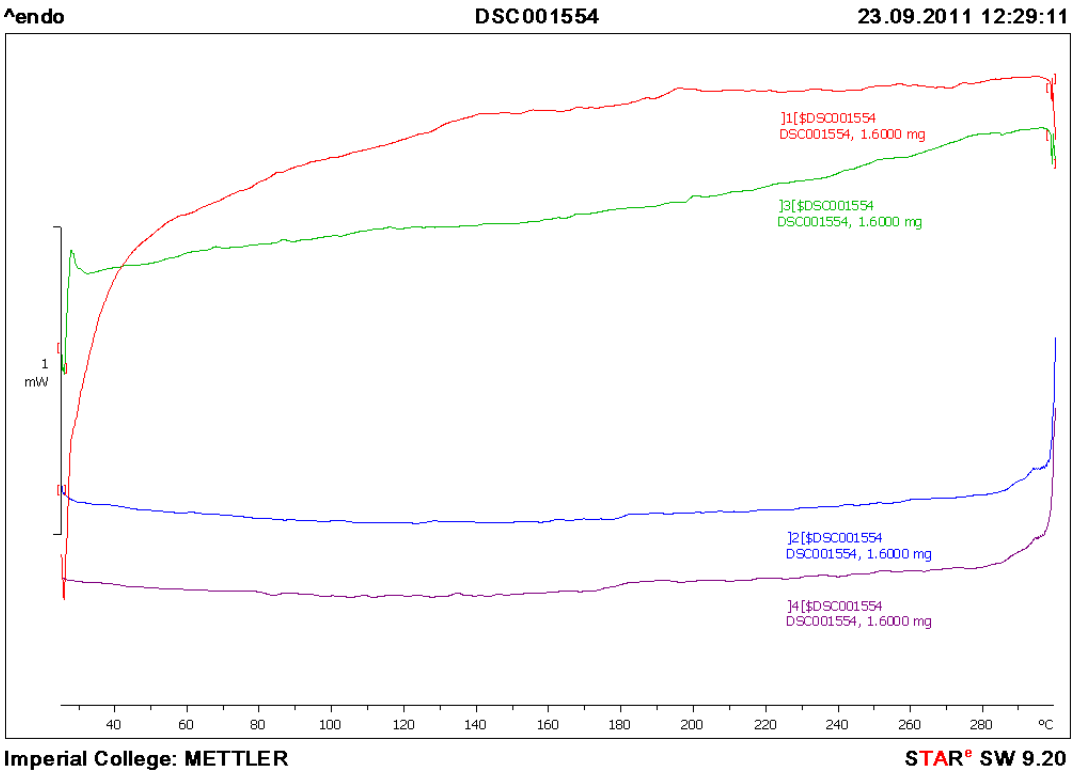

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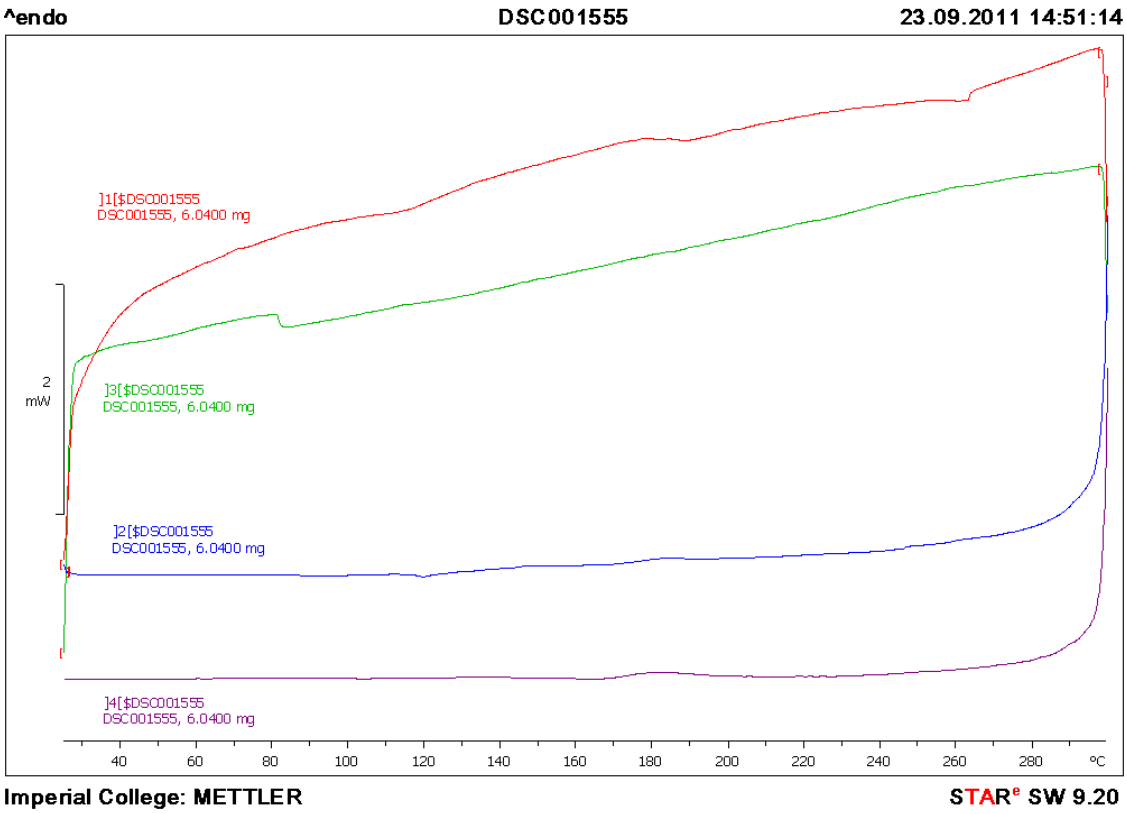
P3



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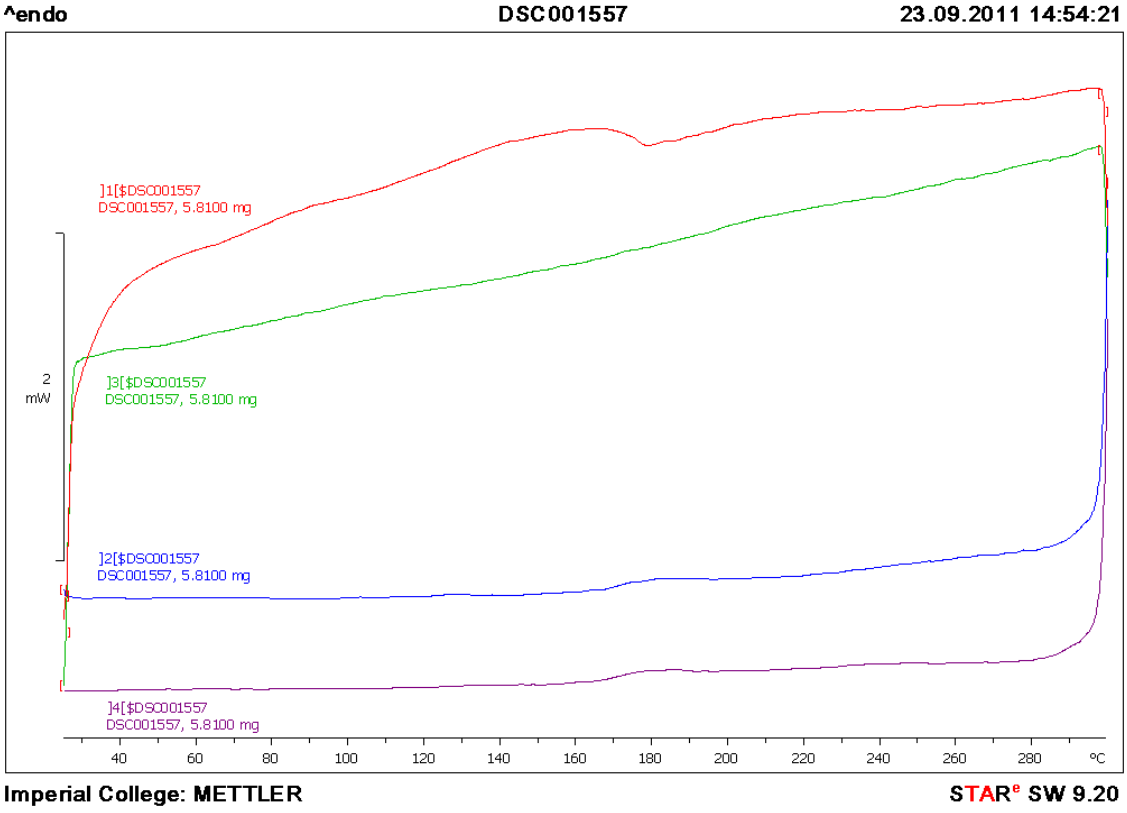

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OFET device results for P1, P3, P4

Bottom gate / Top contact OFETs

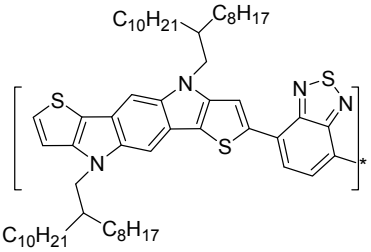
Bottom-gate, Top-contact devices were fabricated on highly doped p type Si with 400nm SiO2 dielectric layer. Si/SiO2 was treated with OTS or HMDS depending on wettability of each polymer. For source and drain electrode, 60nm Au electrodes was deposited by thermal evaporation. Polymer films were spin cast from hot dichlorobenzene solution (5mg/ml) at 1000rpm and annealed at 150°C or 200 °C for 10 min.

Measurement:

V_G varied from 10 to -60 V in 1 V steps
V_D set at -5 (linear) and -60 V (saturation)

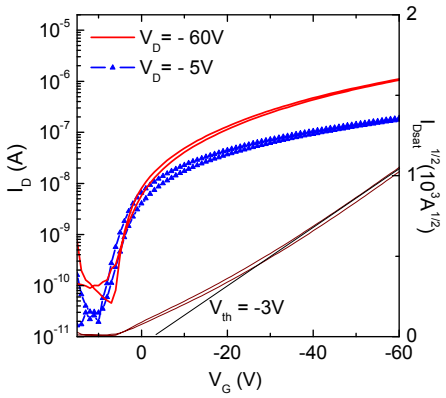
Results:

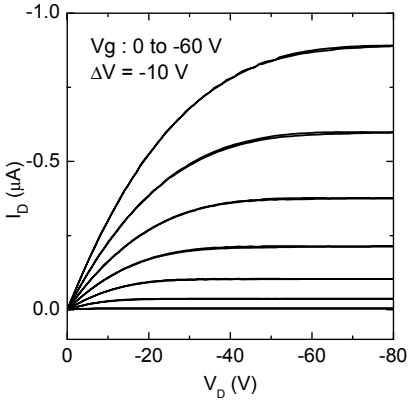
P1



Si wafers were treated with OTS and film was annealed at 200°C for 10min.

L = 200, W = 1000





μ_{sat} = 0.02 cm^2/Vs, μ_{lin} = 0.02 cm^2/Vs

P3

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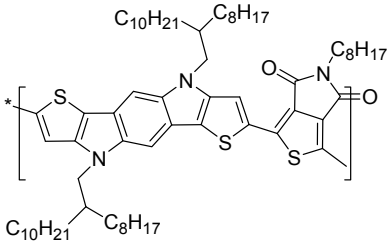
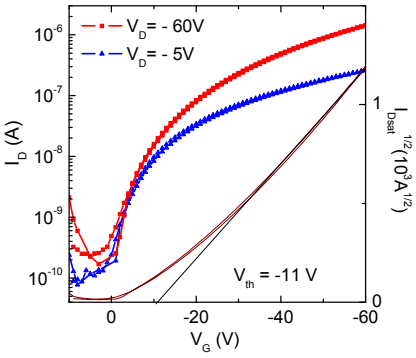
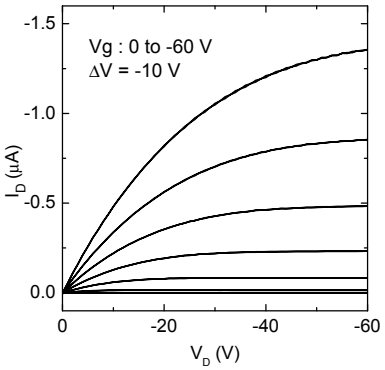


Si substrates were treated with HMDS and the polymer film was annealed at 150°C for 10min.

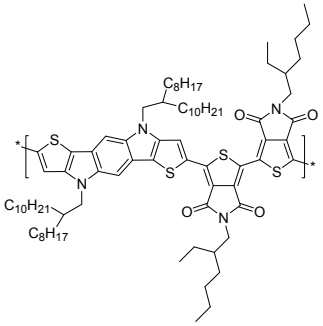
L = 70, W = 1000





μ_{sat} = 0.012 cm^2/Vs, μ_{lin} = 0.012 cm^2/Vs, $I_{on/off}$ = 9.5x10^3

P4



Top-gate, bottom-contact devices were fabricated on glass with Au-PFBT electrodes, CYTOP dielectric and Al gate. Polymer films were spin cast at 2000 rpm and annealed at 150 °C for 10 min.

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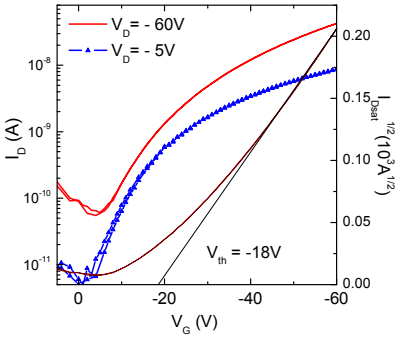

$\mu_{sat} = 0.0012\ cm^2/Vs$, $\mu_{lin} = 0.001\ cm^2/Vs$