

Supplementary data

(i) Preparation of regioregular poly-(3-hexylthiophene)-copoly-({thiophen-3-yl}-hexan-1-ol), **3**:—monomer **1** (1.0 g, 2.9 mmol), monomer **2** (4.76 g, 14.6 mmol) and anhydrous thf (50 cm³) were placed in a 100 cm³ flame-dried round bottomed flask. Methylmagnesium bromide (17.5 cm³ of a 1.0 M solution in Bu₂O; 17.5 mmol) was added, and the solution was stirred for 5 min., and then heated to reflux for 2 h. After this time, the solution was cooled to room temperature, and [NiCl₂(dppp)] (0.19 g, 2 mol%) was added in one portion. More thf (20 cm³) was added, and the mixture was again brought to reflux. After 16 h., it was allowed to cool to room temperature, and was then quenched by pouring into MeOH (400 cm³). The precipitated polymer was filtered into a Soxhlet thimble, and sequentially extracted with MeOH, hexanes, then CHCl₃. The CHCl₃ fraction was evaporated to dryness, and characterised. Yield 2.04 g, 69%. Microanalyses: Found: C = 70.85, H = 8.12 %. Calc. for copolymer **3** (1:8.5 **1:2**): C = 71.51, H = 8.40 %. ¹H NMR (CDCl₃): δ = 7.00 (s, head-to-tail thienyl H), 3.67 (t, CH₂OH), 2.82 (t, CH₂thienyl), 1.7–1.2 (m's, -CH₂-), 0.94 (t, -CH₃). ¹³C {¹H} NMR (CDCl₃): δ = 140.3, 134.2, 130.9, 129.0 (thienyl C), 63.4 (CH₂OH), 33.2, 32.3, 30.9, 29.9, 29.8, 29.6, 29.3, 26.0, 23.1 (various -CH₂-), 14.5 (-CH₃). GPC (PL-ELS 1000; PS calibration, thf, 1 cm³ min⁻¹, 40 °C): *M*_w 17,500, *M*_n 14,330, PD 1.22.

(ii) Biotin functionalisation of regioregular poly-(3-hexylthiophene)-copoly-({thiophen-3-yl}-hexan-1-ol):— Polymer **3** (0.100 g; ca 0.063 mmol -OH equiv.) was dissolved in dry CHCl₃ (15 cm³) and DCC (0.143 g, 0.69 mmol), DMAP (0.02 g, 0.16 mmol) and biotin (0.100 g, 0.41 mmol) were added. The mixture was stirred at room temperature for 48 hours, and was then partitioned between CHCl₃ and water (4 x 50

cm³). The CHCl₃ fractions were combined, dried over MgSO₄, filtered and the solvent removed to yield the polymer as a purple solid. The polymer was Soxhlet extracted with methanol for 16 h. ¹H NMR (CDCl₃ 250 MHz): δ 7.00 (s, 1H, H4), 4.47, 4.29 (m's, 1H each, biotin -CHCH-), 4.10 (t, 2H, CH₂OC(O)), 3.67 (overlapping m, unreacted CH₂OH, and biotin CHS), 3.51 (m, 2H, biotin CH₂S), 2.80 (CH₂thienyl), 2.30 (t, 2H, CH₂C(O)), 1.7-1.2 (m's), 0.94 (t, CH₃).

(iii) The reaction is not quantitative presumably owing to the poor solubility of biotin in CHCl₃, but reactions conducted in CHCl₃/dmf mixtures were completely unsuccessful.

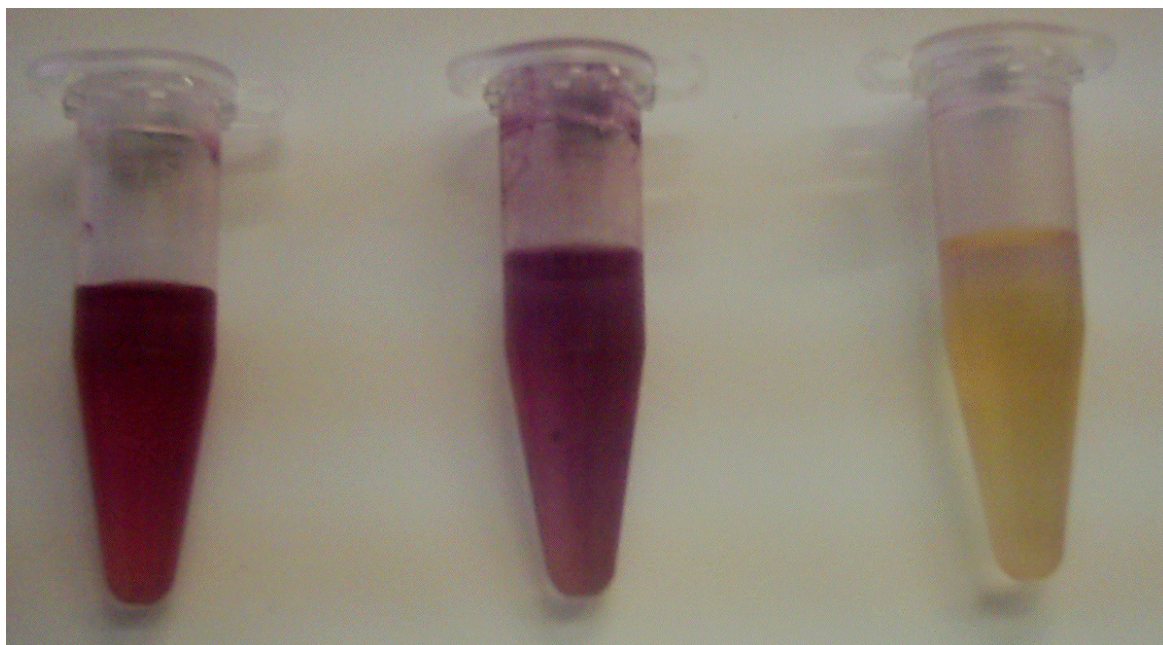


Figure (Left) Polymer **4** in 1:1 CHCl₃:dmsO; (centre) after addition of 1 drop aqueous buffer containing BSA as described in text; (right) after addition of aqueous buffer containing avidin as described in text.

