Supplementary Material (ESI) for Chemical Communications

Electronic supplementary information

Electrochemical behaviour and characterization of monomer **3** and *poly*-**3**

The cyclic voltammetry curves for **3** in CH_3CN (Fig. S1) exhibit three reversible and monoelectronic waves corresponding to the $V^{2+/.+}$, $V^{.+/0}$ and $Fc^{0/+}$ redox couples at $E_{1/2}$ = –1.16, –0.75 and 0.27 V vs Ag/Ag^+, respectively. In addition an anodic peak is seen at E_{pa} = 1.07 V, corresponding to the irreversible oxidation of the appended pyrrole group leading to polypyrrole formation.

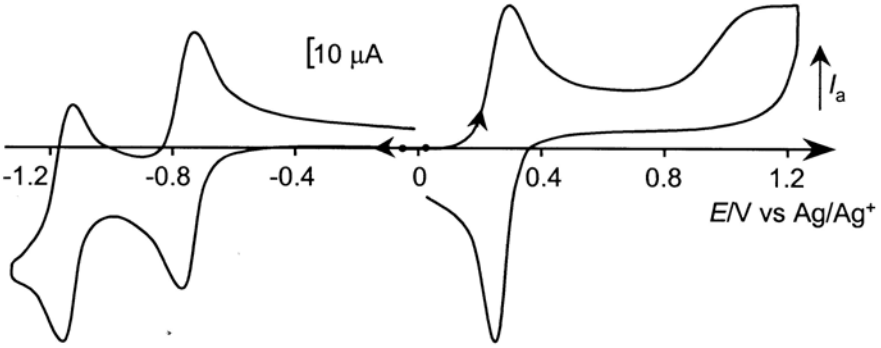

Fig. S1. CV curve recorded at a carbon disc electrode (3 mm diameter) in a millimolar solution of **3** in CH_3CN + 0.1 M TBAP; scan rate = 0.1 V s^{-1}.

The modified electrodes synthesized by controlled potential electrolysis at +0.9 V in millimolar solutions of **3** display the stable electrochemical response for immobilized *poly*-**3** films (see figure 2). However, as for other ferrocene-containing polypyrrole homopolymers,[1-3] no clear redox peaks system attributable to the electroactivity of the polypyrrole matrix could be detected on the CV curves for the modified electrodes. Obviously the electrochemical response of the polypyrrole chain, which is expected to be see around 0.4 V,[4] may be hidden under that of the ferrocene moieties. Furthermore, under our experimental conditions the electroactivity of the polypyrrole matrix could partially be destroyed following some overoxidation.

The apparent surface concentration of **3** in polymer films (denoted Γ) was determined from the integrated current recorded under the ferrocene oxidation wave.

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