Anion triggered electropolymerisation in ferrocene functionalised ortho-phenylenediamine based receptors

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Supplementary information

Figure S1 $^1$H NMR spectrum of compound 1 in DMSO-$d_6$
Figure S2 $^{13}$C\{^1H\} NMR spectrum of compound 1 in DMSO-d$_6$

Figure S3 $^1$H NMR spectrum of compound 2 in DMSO-d$_6$
Figure S4 $^{13}$C{${}^1$H} NMR spectrum of compound 2 in DMSO-d$_6$

Figure S5 $^1$H NMR spectrum of compound 3 in DMSO-d$_6$
Figure S6 $^{13}$C{${}^1$H} NMR spectrum of compound 3 in DMSO-d$_6$

Figure S7 $^1$H NMR spectrum of compound 4 in DMSO-d$_6$
Figure S8 $^{13}$C\text{\{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{H}}}}}}}}}}}}}}$ NMR spectrum of compound 4 in DMSO-$d_6$

Figure S9 $^1$H NMR spectrum of compound 5 in DMSO-$d_6$
Figure S10 $^{13}$C\{1H\} NMR spectrum of compound 5 in DMSO-d$_6$

Figure S11 $^1$H NMR spectrum of compound 6 in DMSO-d$_6$
**Figure S12** $^{13}$C-$^1$H NMR spectrum of compound 6 in DMSO-$d_6$.

**Figure S13** $^1$H NMR titration curve of 1 with tetrabutylammonium acetate.
Figure S14 $^1$H NMR titration curve of 1 with tetrabutylammonium benzoate.

Figure S15 $^1$H NMR titration curve of 1 with tetrabutylammonium dihydrogenphosphate.
Figure S16 $^{1}$H NMR titration curve of 1 with tetrabutylammonium chloride.

Figure S17 $^{1}$H NMR titration curve of 2 with tetrabutylammonium acetate.
**Figure S18** $^1$H NMR titration curve of 2 with tetrabutylammonium benzoate.

**Figure S19** $^1$H NMR titration curve of 2 with tetrabutylammonium dihydrogenphosphate.
Figure S20 $^1$H NMR titration curve of 2 with tetrabutylammonium chloride.

Figure S21 $^1$H NMR titration curve of 3 with tetrabutylammonium acetate.
Figure S22 $^1$H NMR titration curve of 3 with tetrabutylammonium benzoate.

Figure S23 $^1$H NMR titration curve of 3 with tetrabutylammonium dihydrogenphosphate.
**Figure S24** $^1$H NMR titration curve of 3 with tetrabutylammonium chloride.

**Figure S25** $^1$H NMR titration curve of 4 with tetrabutylammonium acetate.
**Figure S26** $^1$H NMR titration curve of 4 with tetrabutylammonium benzoate.

**Figure S27** $^1$H NMR titration curve of 4 with tetrabutylammonium dihydrogenphosphate.
**Figure S28** $^1$H NMR titration curve of 4 with tetrabutylammonium chloride.

**Figure S29** $^1$H NMR titration curve of 5 with tetrabutylammonium acetate in DMSO-$d_6$/0.5% H$_2$O.
Figure S30 $^1$H NMR titration curve of 5 with tetrabutylammonium benzoate in DMSO-$d_6$/0.5% H$_2$O.

Figure S31 $^1$H NMR titration curve of 5 with tetrabutylammonium dihydrogenphosphate in DMSO-$d_6$/0.5% H$_2$O.
Figure S32: $^1$H NMR titration curve of 5 with tetrabutylammonium chloride in DMSO-$d_6$/0.5% H$_2$O.

Figure S33: $^1$H NMR titration curve of 5 with tetrabutylammonium acetate in DMSO-$d_6$/5.0% H$_2$O.
Figure S34 $^1$H NMR titration curve of 5 with tetrabutylammonium benzoate in DMSO-$d_6$/5.0% H$_2$O.

Figure S35 $^1$H NMR titration curve of 5 with tetrabutylammonium dihydrogenphosphate in DMSO-$d_6$/5.0% H$_2$O.
Figure S36 $^1$H NMR titration curve of 6 with tetrabutylammonium acetate.

Figure S37 $^1$H NMR titration curve of 6 with tetrabutylammonium benzoate.
Figure S38 $^1$H NMR titration curve of 6 with tetrabutylammonium dihydrogenphosphate.

Figure S39 $^1$H NMR titration curve of 6 with tetrabutylammonium chloride.
**Figure S40** Cyclic voltammetric data gathered for compound (3) at a 3 mm diameter glassy carbon disk as a function of acetate to ferrocene receptor concentration ratio (0: ▬, 2:1 ▬ and 5:1 ▬ respectively). The electrolyte consisted of 0.1 mol dm$^{-3}$ TBATFP in (95% CH$_3$CN/5% DMSO). The initial ferrocene derivative concentration was 1 mM. All voltammetry was recorded at 20 mV s$^{-1}$ under anaerobic conditions at 20-23°C.

**Figure S41** Cyclic voltammetric data gathered for compound (4) at a 3 mm diameter glassy carbon disk as a function of acetate to ferrocene receptor concentration ratio (0: ▬, 2:1 ▬ and 5:1 ▬ respectively). The electrolyte consisted of 0.1 mol dm$^{-3}$ TBATFP in (95% CH$_3$CN/5% DMSO). The initial ferrocene derivative concentration was 1 mM. All voltammetry was recorded at 20 mV s$^{-1}$ under anaerobic conditions at 20-23°C.
Figure S42 Cyclic voltammetric data gathered for compound (5) at a 3 mm diameter glassy carbon disk as a function of acetate to ferrocene receptor concentration ratio (0:1, 2:1 and 5:1 respectively). The electrolyte consisted of 0.1 mol dm$^{-3}$ TBATFP in (95% CH$_3$CN/5% DMSO). The initial ferrocene derivative concentration was 1 mM. All voltammetry was recorded at 20 mV s$^{-1}$ under anaerobic conditions at 20-23°C.

Figure S43 Cyclic voltammetric data gathered for compound (6) at a 3 mm diameter glassy carbon disk as a function of acetate to ferrocene receptor concentration ratio (0:1, 2:1 and 5:1 respectively). The electrolyte consisted of 0.1 mol dm$^{-3}$ TBATFP in (95% CH$_3$CN/5% DMSO). The initial ferrocene derivative concentration was 1 mM. All voltammetry was recorded at 20 mV s$^{-1}$ under anaerobic conditions at 20-23°C.