Supporting Information

Voltammetric studies of hexachromic anion transfer reactions across micro-water/polyvinylchloride-2-nitrophenyloctylether gel interfaces for sensing applications

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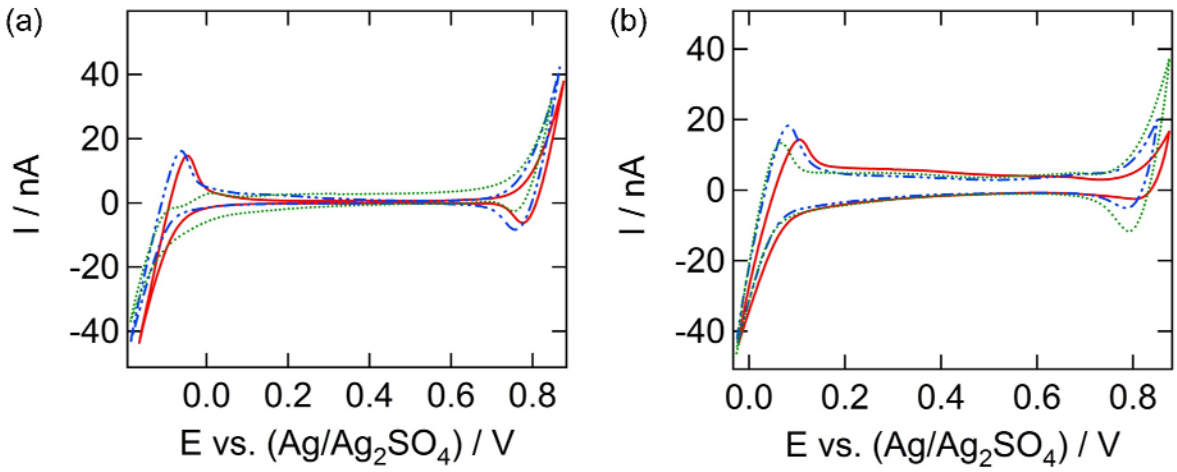
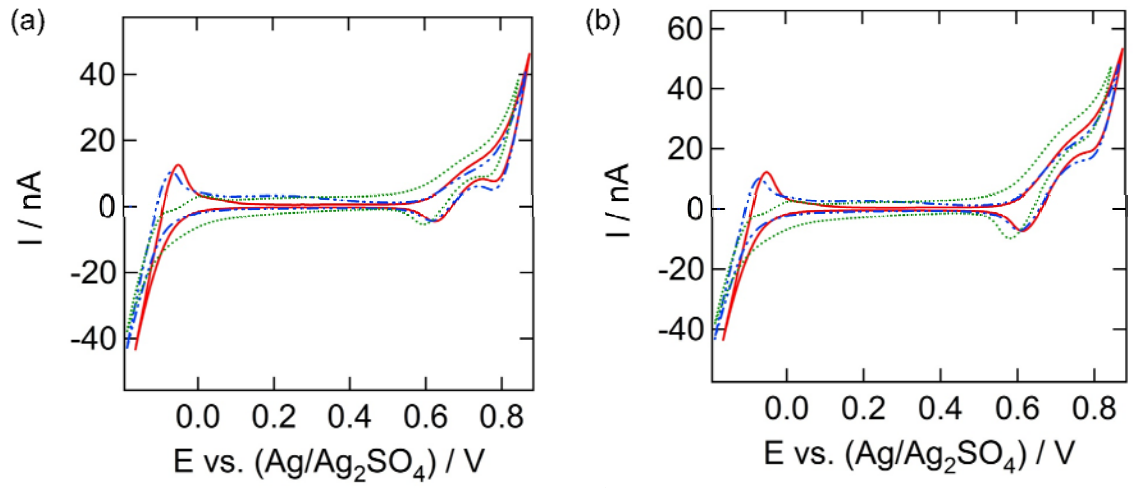
Fig. S.1. Cyclic voltammograms for the potential window characterization when using the 66 microhole array interface between the aqueous and PVC-NPOE gel phase. Na_2SO_4 was only added to a pH water solution of 4, 7 and 10. (a) and (b) exhibit the voltammetric responses from six different microhole array-water/PVC-NPOE gel interfaces for different pH conditions of (i) pH 4 (red solid line), (ii) pH 7 (blue dotted line) and (iii) pH 10 (green dotted line). Cell 1 is used with 10 mM Na_2SO_4 in the absence of TMACl and Cr(VI) ions. Scan rate is 20 mVs^{-1}.



Note: Both sets of cyclic voltammogram data show that only slight changes within the error range of ±15 mV in the potential window can be observed for different pH values of aqueous solutions when using the 66 microhole array-water/PVC-NPOE gel interface. Two sets of data were obtained using six different microhole array interfaces and electrochemical responses for chip to chip variation were almost negligible. Note that for the case of using pH 10 solution, the OH^- ion concentration could contribute often to widening of the capacitive currents in the region of 0.1 V to 0.6 V.

Fig. S.2. Cyclic voltammograms for the transfer of TMA^+ ions across the 66 microhole array interface between the aqueous and PVC-NPOE gel phase. (a) 0.05 mM TMACl and (b) 0.1 mM TMACl were used at different pH conditions of (i) pH 4 (red solid line), (ii) pH 7 (blue dotted line) and (iii) pH 10 (green dotted line). Cell 1 in the main text was used with 10 mM Na_2SO_4 in the absence Cr (VI) ions. Scan rate is 20 mVs^{-1}.



Note: The half-wave potential of the transfer of TMA^+ ions at pH 10 was found to be shifted about 10 mV towards more negative potential which may coming from the OH^- contribution. Nonetheless the steady-state current responsible for the TMA^+ ion transfer from the water to the organic gel remained the same as for all three different pH solutions of 4, 7 and 10. In addition, the steady-state current increases as a function of the TMA^+ ion concentration.