Electronic Supplementary Material (ESI) for Analytical Methods

Applications of Voltammetric Ion Selective Electrodes to Complex Matrices

Supporting Information

Alexander R. Harris[a1*], Jie Zhang[a], Robert W. Cattrall[b] and Alan M. Bond[a]*

[a] School of Chemistry, Monash University, Clayton, Victoria, 3800, Australia
[b] Department of Chemistry, La Trobe University, Bundoora, Victoria, 3086, Australia

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*E-mail address: alex.harris@latrobe.edu.au; alan.bond@monash.edu

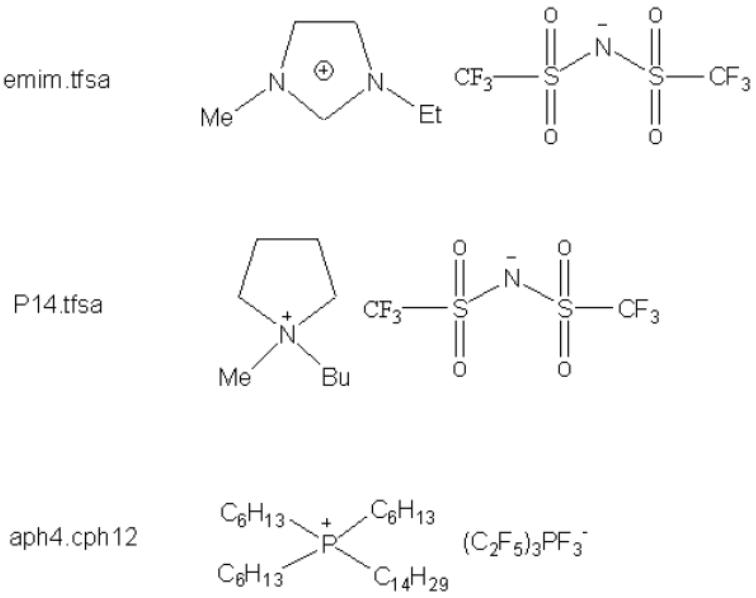

Figure S1. Structures of ionic liquids.

Table S1: Statistical data from the AEROSET 2 at the John Radcliffe Hospital.

Ion	Lower calibrant average activity /mM	Coefficient of Variation	Upper calibrant average activity /mM	Coefficient of Variation
Na^+	122	0.9	156	0.5
K^+	2.7	1.7	6.2	0.9
Ca^{2+}	1.86 *	1.5	2.77 *	1.1

*total concentration

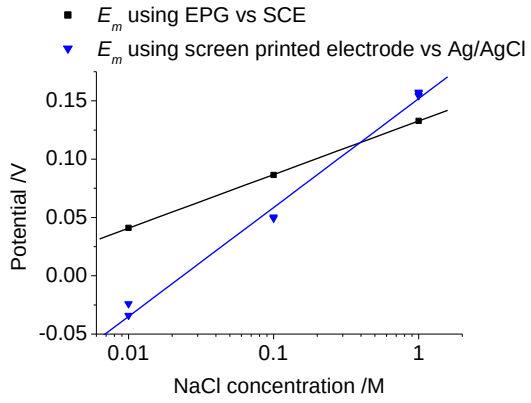

Figure S2. E_m versus NaCl concentration calibration curve of the TCNQ microcrystal sensor and response using the 10th potential cycle on EPG with an SCE reference electrode (black) and on a planar macrodisc screen printed electrode with a Ag/AgCl reference electrode with no salt bridge (blue).

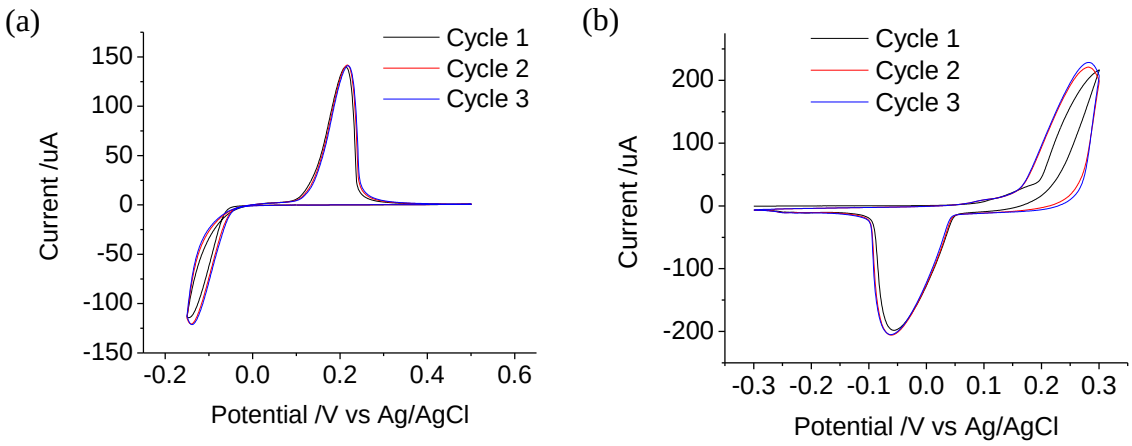

Figure S3: First three potential cycles in 0.1 M NaCl, 50 mM TRIS and HEPES at a scan rate of 100 mV s^{-1} of mechanically adhered (a) TCNQ and (b) TTF on screen printed planar electrodes.

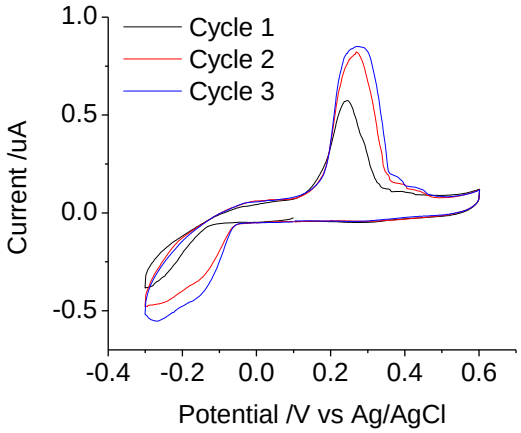

Figure S4: Screen printed planar electrodes with 5 % w/w TCNQ added to the carbon ink working electrode coated with Nafion in 0.1 M NaCl, 50 mM TRIS and HEPES at a scan rate of 100 mV s^{-1}.

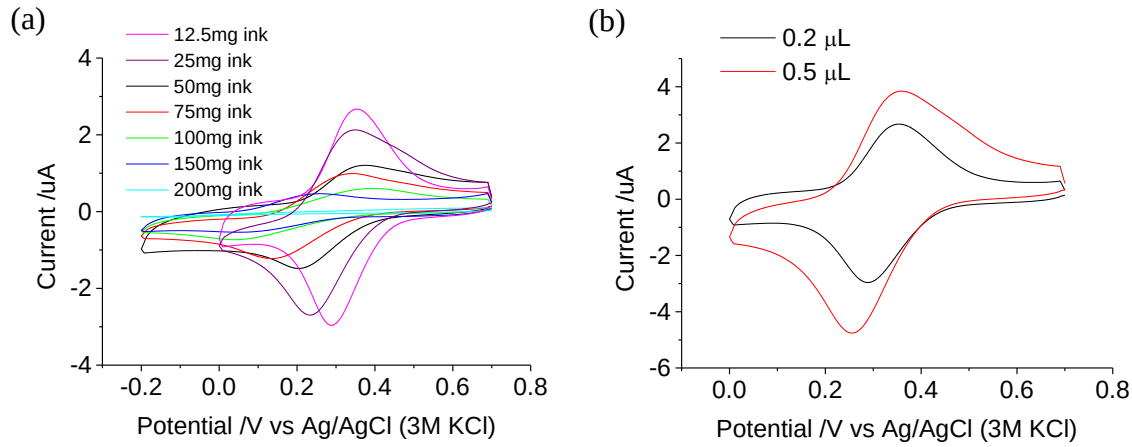

Figure S5. Cyclic voltammetry of a dielectric ink supported thin film VISE with 20 mM Na ionophore VI in 100 mM NaCl at a scan rate of 100 mV s^{-1} (a) varying amount of dielectric ink (b) varying volume of thin film.

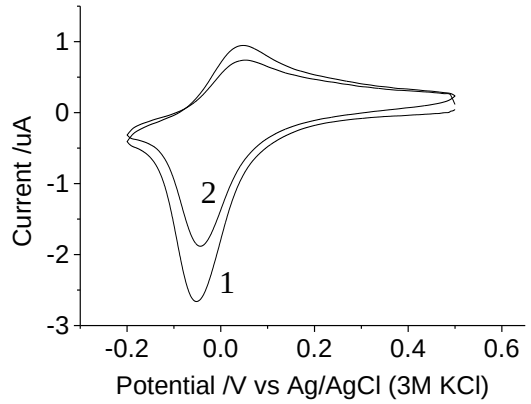

Figure S6. Cyclic voltammetry of a dielectric ink supported thin film in 100 mM NaCl at a scan rate of 100 mV s^{-1} without ionophore. The numbers 1 and 2 refer to the first and second cycle of the potential respectively.

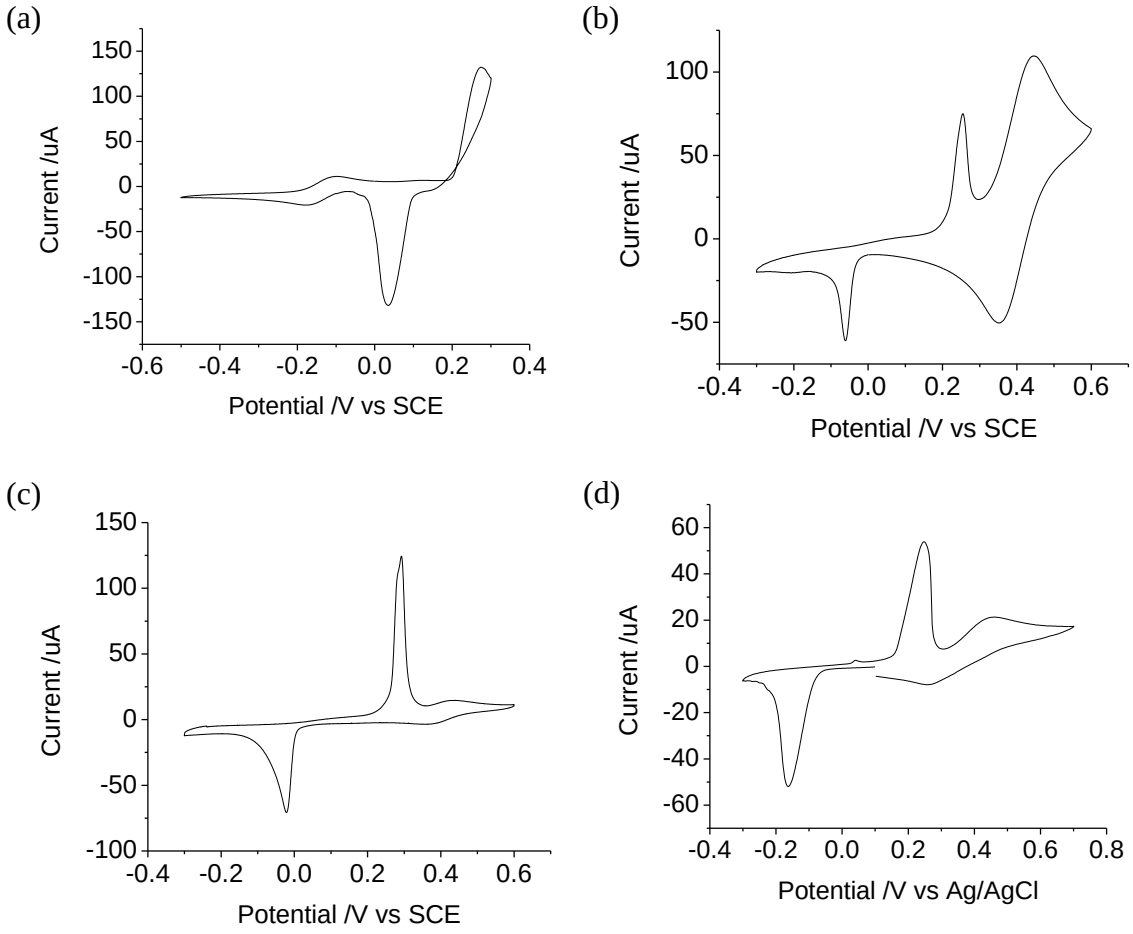

Figure S7: Voltammetry in 0.1 M NaCl at a scan rate of 100 mV s^{-1} on an EPG electrode of mechanically adhered (a) TTF (0.5 mM 1,4-benzoquinone, 3rd potential cycle) and (b) TCNQ (0.1 M TRIS pH9 and 5 mM 1,1′-ferrocenedicarboxylic acid, 3rd potential cycle). Mechanically adhered TCNQ coated with Nafion with (c) 1 mM 1,1′-ferrocenedicarboxylic acid, 1 M NaCl, 50mM TRIS and HEPES, 12th potential cycle on an EPG electrode at a scan rate of 200 mV s^{-1} and (d) mechanically adhered 1,1′-ferrocenedicarboxylic acid in 0.1 M NaCl, 50mM TRIS and HEPES, 1st potential cycle on a screen printed electrode at a scan rate of 100 mV s^{-1}.

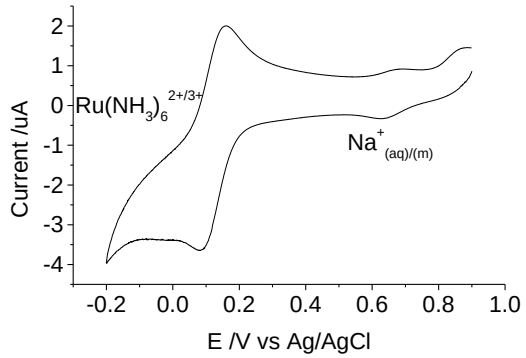

Figure S8. Calibration of a thin film VISE with 10 mM Na ionophore VI in 1 M NaCl at a scan rate of 100 mV s^{-1} versus $Ru(NH_3)_6Cl_3$.

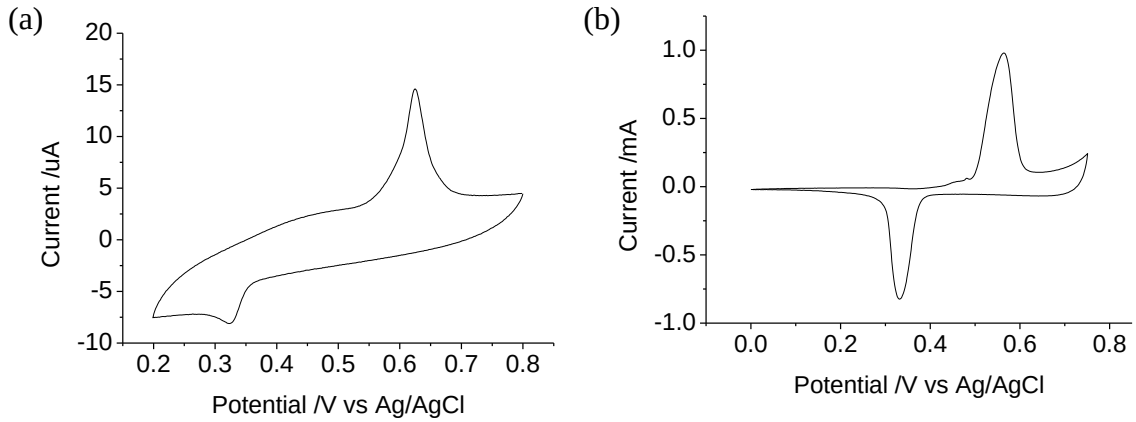

Figure S9: (a) Cyclic voltammetry at an EPG electrode of mechanically adhered TCNQ coated with Nafion at a scan rate of 100 mV s^{-1}, 10^{th} potential cycle in seawater. (b) 6^{th} potential cycle of mechanically adhered TTF on an EPG electrode in seawater at a scan rate of 100 mV s^{-1}.

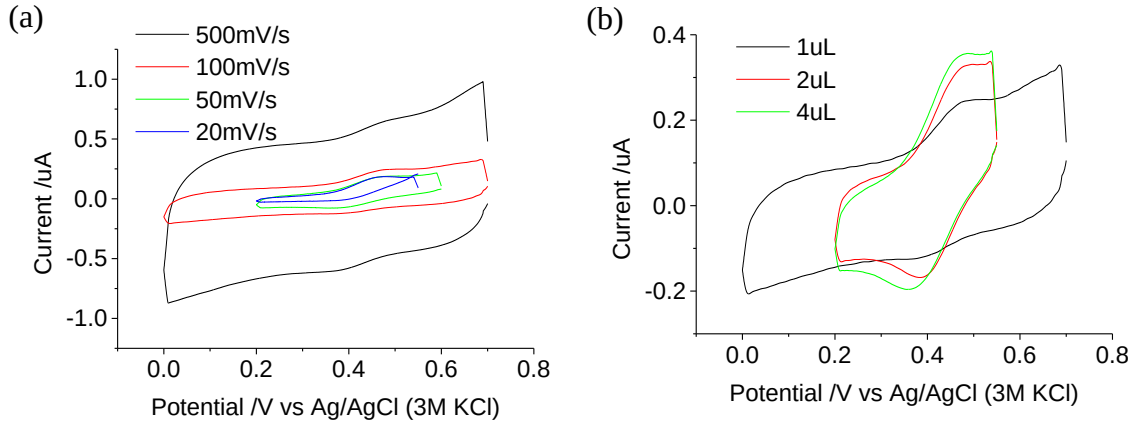

Figure S10. Cyclic voltammetry of a thin film VISE with 20mM Ca ionophore II in plasma varying (a) scan rate of 100 mV s^{-1} with a 1 µL thin film (b) thin film thickness at a scan rate of 100 mV s^{-1}.

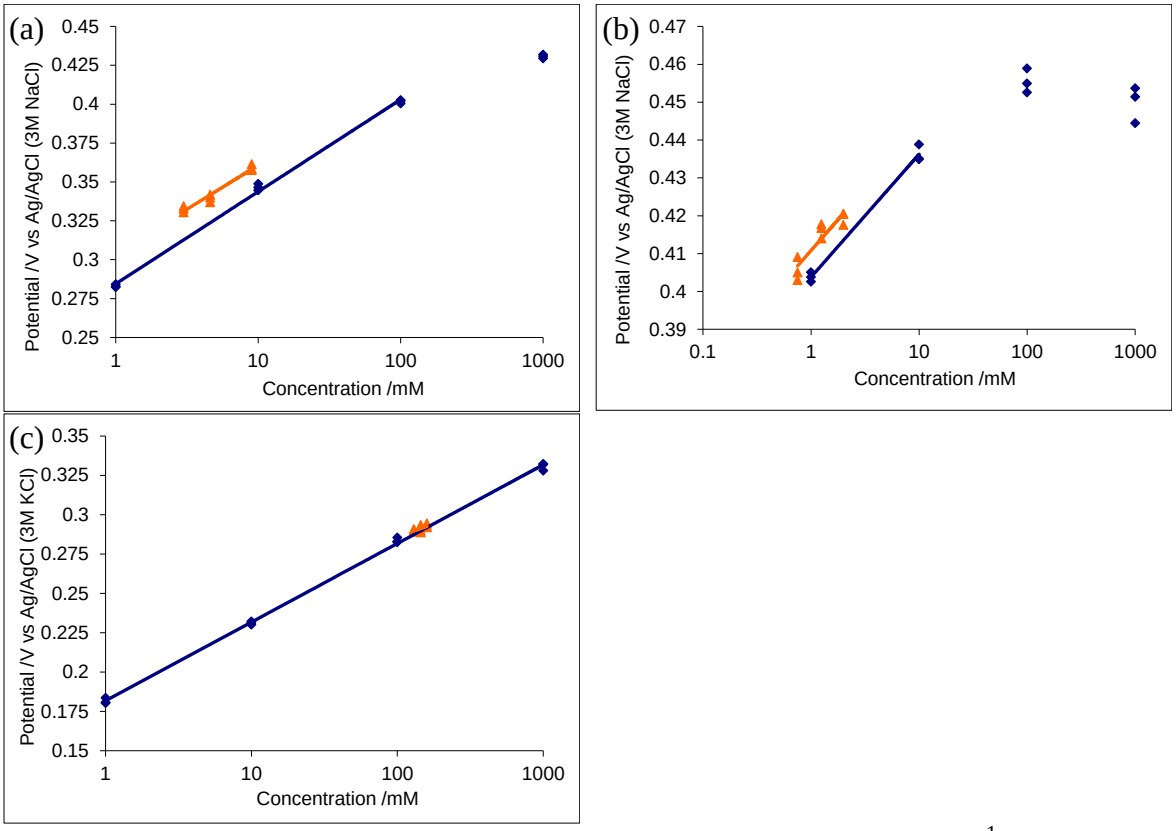

Figure S11. Sensitivity of a 0.2 µL thin film VISE at a scan rate of 100 mV s^{-1} varying NaCl concentration in pure electrolyte (blue) or high ionic strength calibrant solutions (orange) with (a) 20 mM K ionophore III, (b) 20 mM Ca ionophore II or (c) 20 mM Na ionophore VI.