

Supporting information for

Electrochemically Switchable Polymeric Membrane Ion-Selective Electrodes

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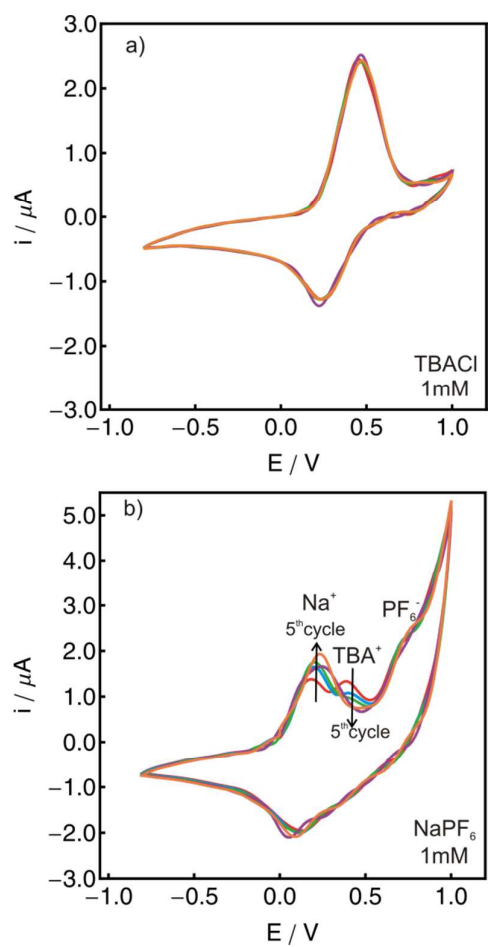


Figure S1. (a) Cyclic voltammograms in 1mM TBACl. (b) Cyclic voltammograms in 1mM NaPF₆. Scan rate: 100 mV·s⁻¹.

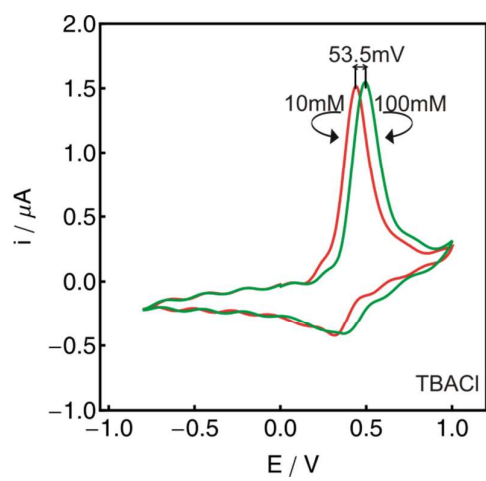


Figure S2. Cyclic voltammograms in 10mM and 100mM TBACl. Scan rate: $100 \text{ mV} \cdot \text{s}^{-1}$.

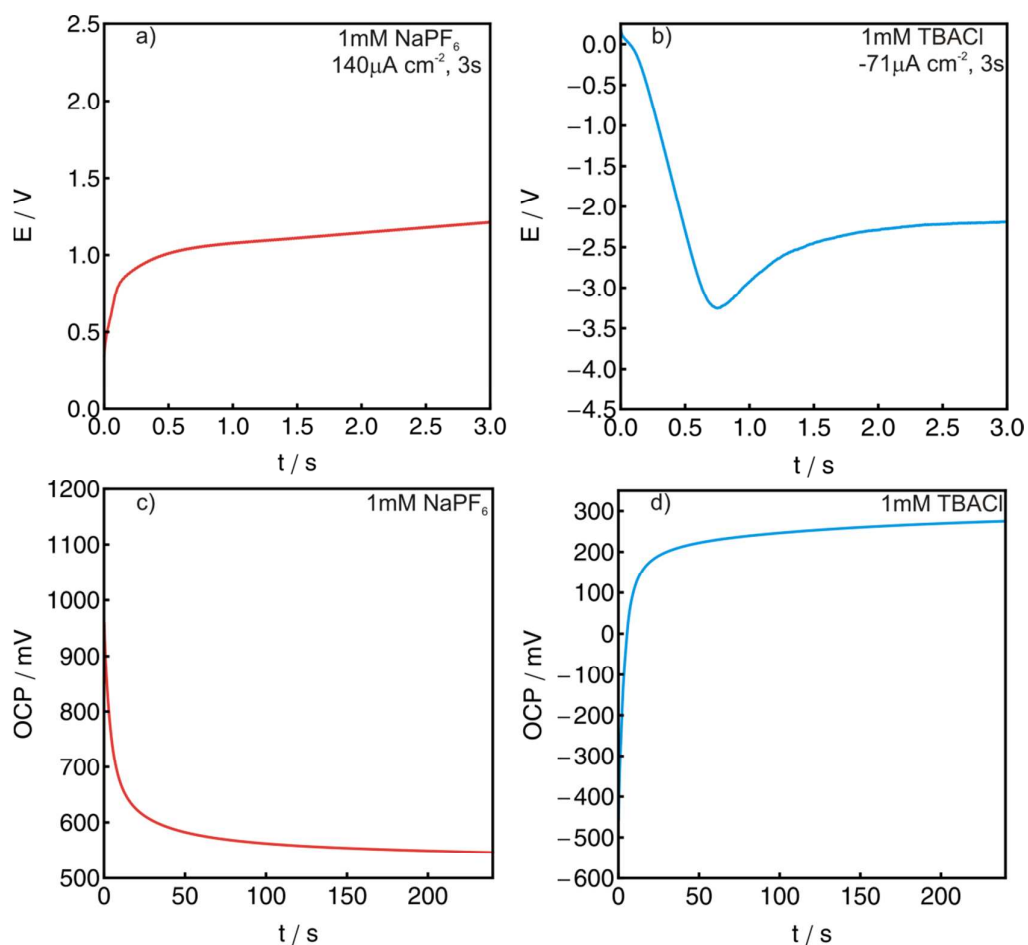


Figure S3. (a) Potential change as a function of time for electrode 1 in 1mM NaPF₆ solution resulting from applying oxidation current of 140 $\mu A \cdot cm^{-2}$ for 3 s and (b) potential change as a function of time for electrode 1 in 1mM TBACl solution resulting from applying reduction current of -71 $\mu A \cdot cm^{-2}$ for 3 s. (c) Open circuit potential as a function of time for electrode 1 in 1mM NaPF₆ solution. (d) Open circuit potential as a function of time for electrode 1 in 1mM TBACl solution.

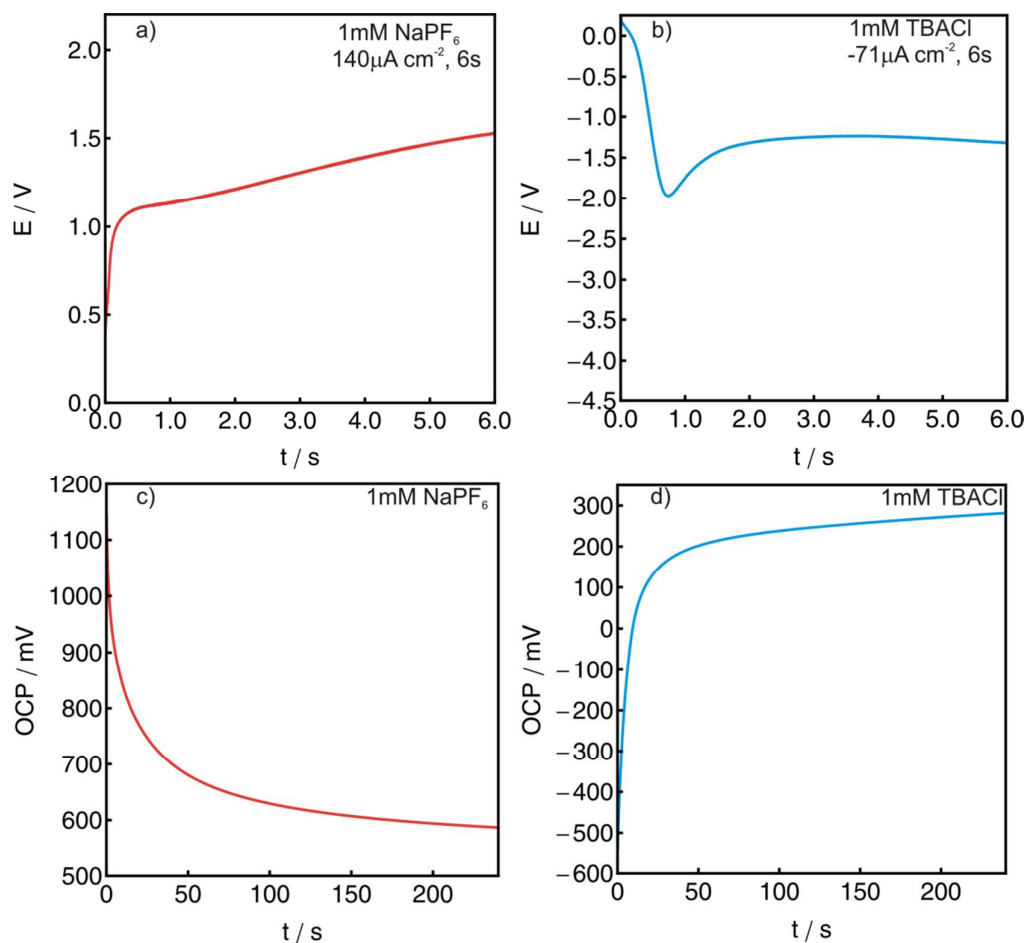


Figure S4. (a) Potential change as a function of time for electrode 2 in 1mM NaPF₆ solution resulting from applying oxidation current of 140 $\mu A \cdot cm^{-2}$ for 6 s and (b) Potential change as a function of time for electrode 2 in 1mM TBACl solution resulting from applying reduction current of -71 $\mu A \cdot cm^{-2}$ for 6 s. (c) Open circuit potential as a function of time for electrode 2 in 1mM NaPF₆ solution. (d) Open circuit potential as a function of time for electrode 2 in 1mM TBACl solution.

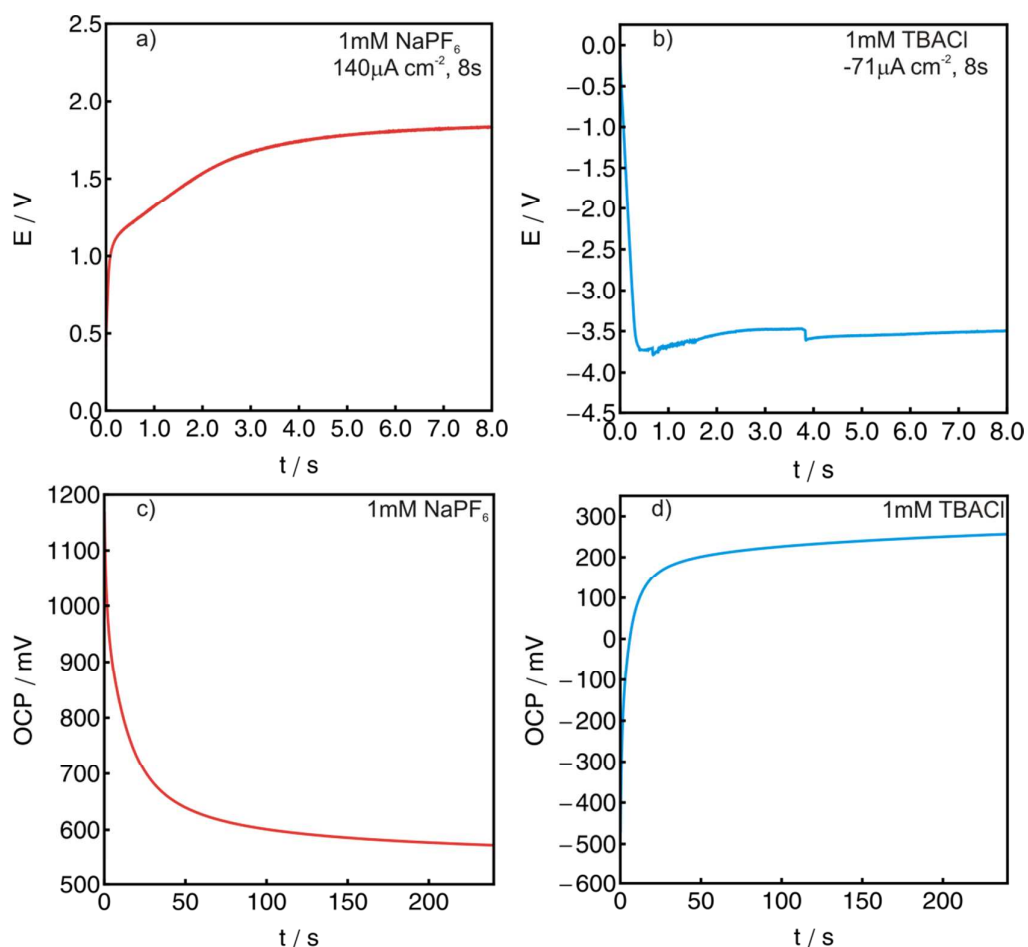


Figure S5. (a) Potential change as a function of time for electrode 3 in 1mM NaPF₆ solution resulting from applying oxidation current of 140 $\mu A \cdot cm^{-2}$ for 8 s and (b) Potential change as a function of time electrode 3 in 1mM TBACl solution resulting from applying reduction current of -71 $\mu A \cdot cm^{-2}$ for 8 s. (c) Open circuit potential as a function of time electrode 3 in 1mM NaPF₆ solution. (d) Open circuit potential as a function of time electrode 3 in 1mM TBACl solution.

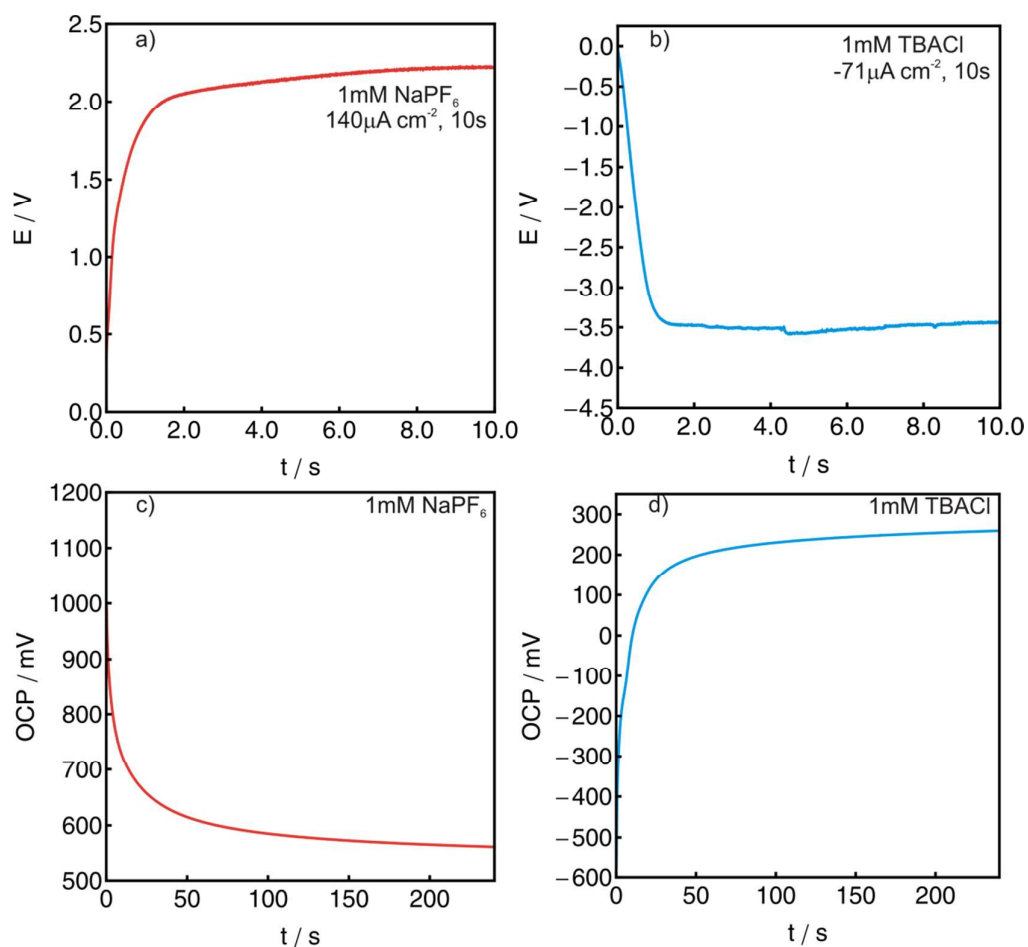


Figure S6. (a) Potential change as a function of time electrode 4 in 1mM NaPF_6 solution resulting from applying oxidation current of $140 \mu\text{A cm}^{-2}$ for 10s and (b) Potential change as a function of time electrode 4 in 1mM TBACl solution resulting from applying reduction current of $-71 \mu\text{A cm}^{-2}$ for 10 s. (c) Open circuit potential as a function of time electrode 4 in 1mM NaPF_6 solution. (d) Open circuit potential as a function of time electrode 4 in 1mM TBACl solution.

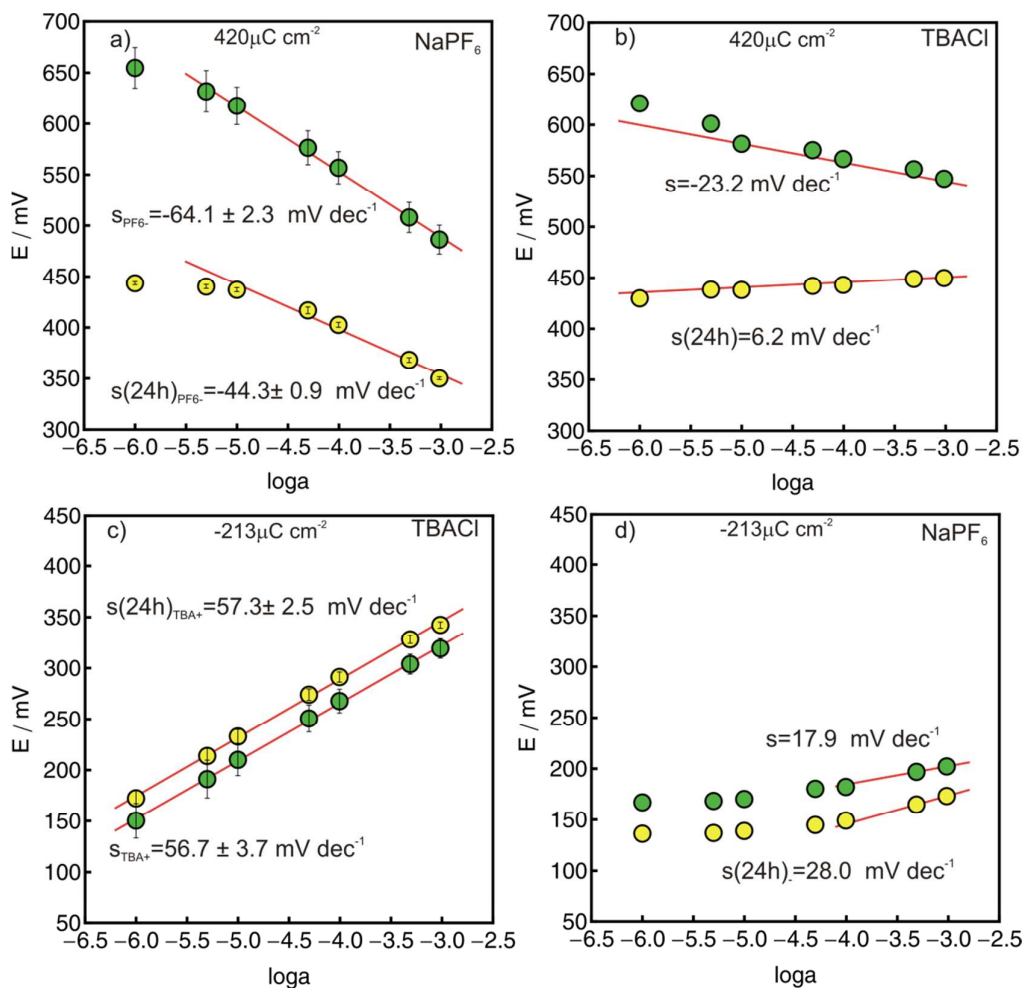


Figure S7. Potentiometric responses of electrode 1 in (a) NaPF₆ and (b) TBACl solutions after applying oxidation current of 140 $\mu\text{A}\cdot\text{cm}^{-2}$ for 3 s and in (c) TBACl and (d) NaPF₆ solutions after applying reduction current of -71 $\mu\text{A}\cdot\text{cm}^{-2}$ for 3 s. Error bars are standard deviations ($n = 3$).

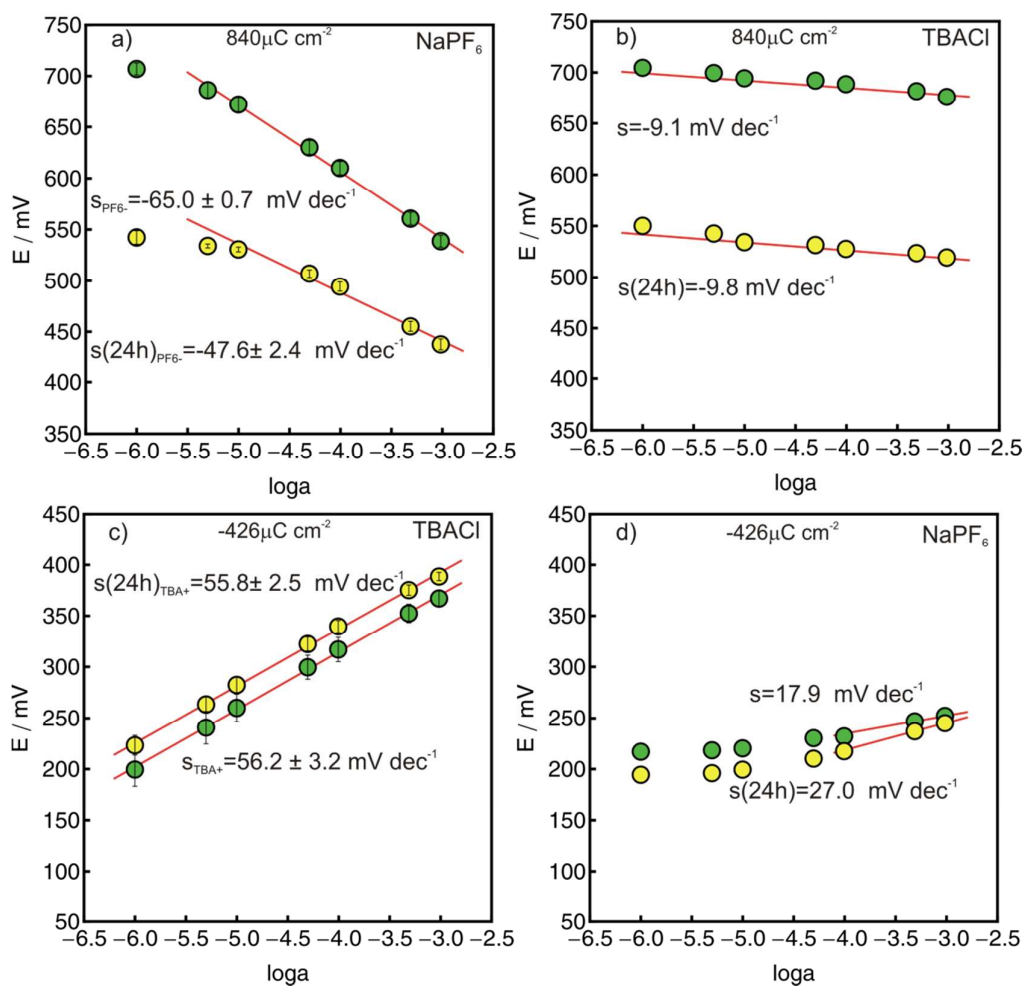


Figure S8. Potentiometric responses of electrode 2 in (a) NaPF_6 and (b) TBACl solutions after applying oxidation current of $140 \mu\text{A}\cdot\text{cm}^{-2}$ for 6 s and in (c) TBACl and (d) NaPF_6 solutions after applying reduction current of $-71 \mu\text{A}\cdot\text{cm}^{-2}$ for 6 s. Error bars are standard deviations ($n = 3$).

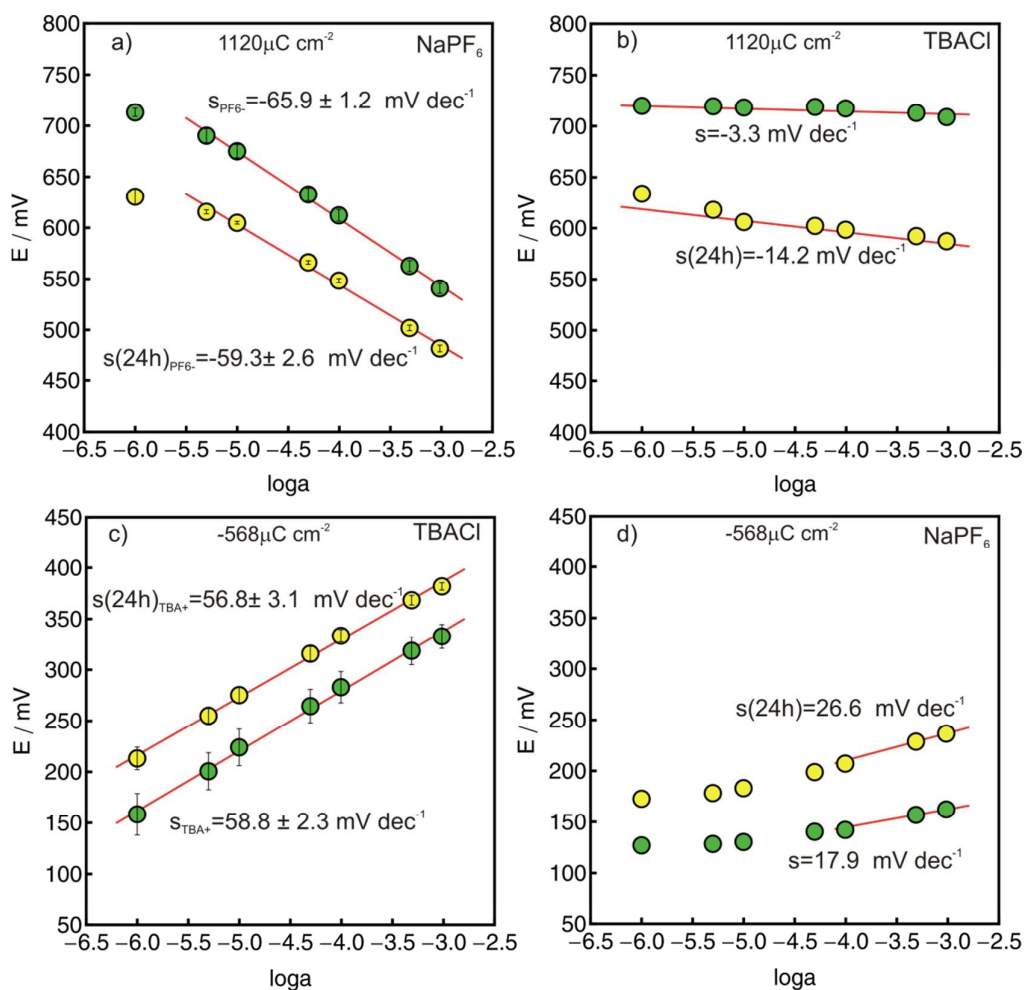


Figure S9. Potentiometric responses of electrode 3 in (a) NaPF₆ and (b) TBACl solutions after applying oxidation current of $140 \mu\text{A}\cdot\text{cm}^{-2}$ for 8 s and in (c) TBACl and (d) NaPF₆ solutions after applying reduction current of $-71 \mu\text{A}\cdot\text{cm}^{-2}$ for 8 s. Error bars are standard deviations ($n = 3$).

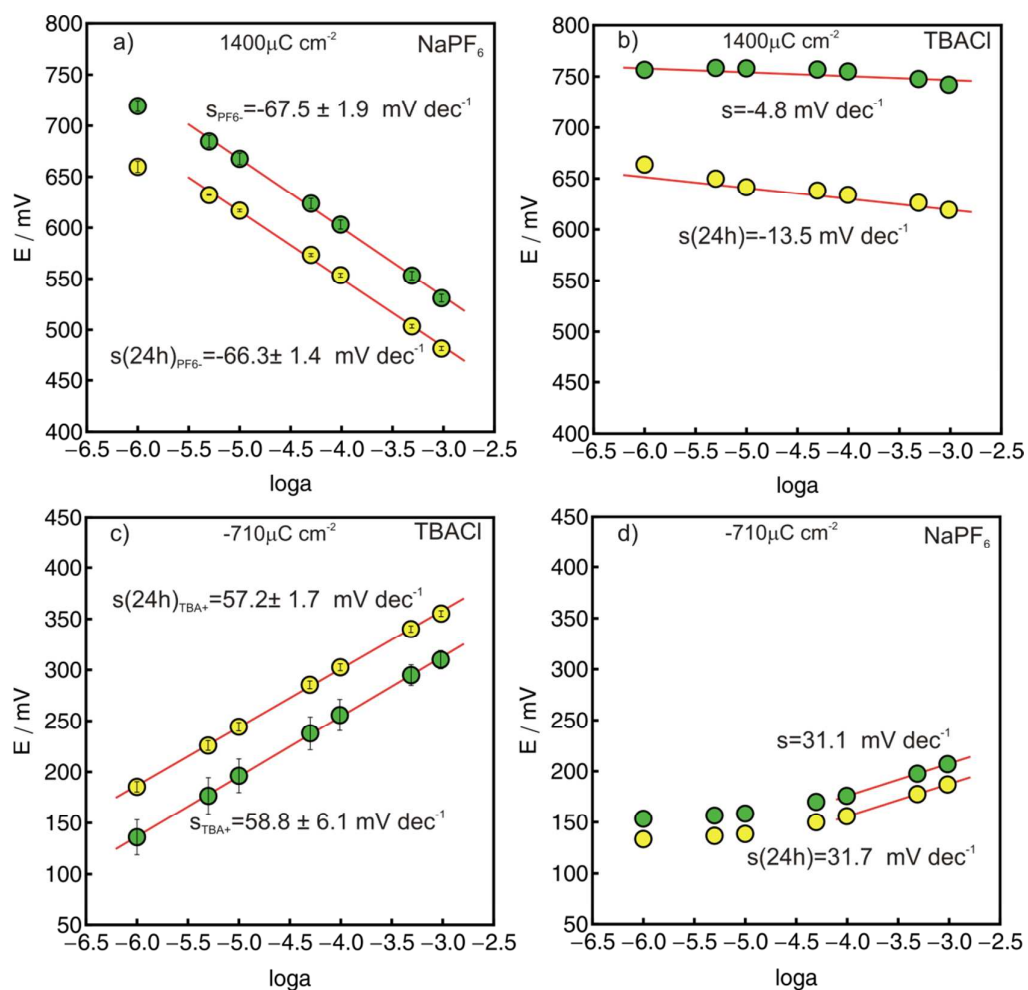


Figure S10. Potentiometric responses of electrode 4 in (a) NaPF₆ and (b) TBACl solutions after applying an oxidation current of 140 μA·cm⁻² for 10 s and in (c) TBACl and (d) NaPF₆ solutions after applying reduction current of -71 μA·cm⁻² for 10 s. Error bars are standard deviations (n = 3).

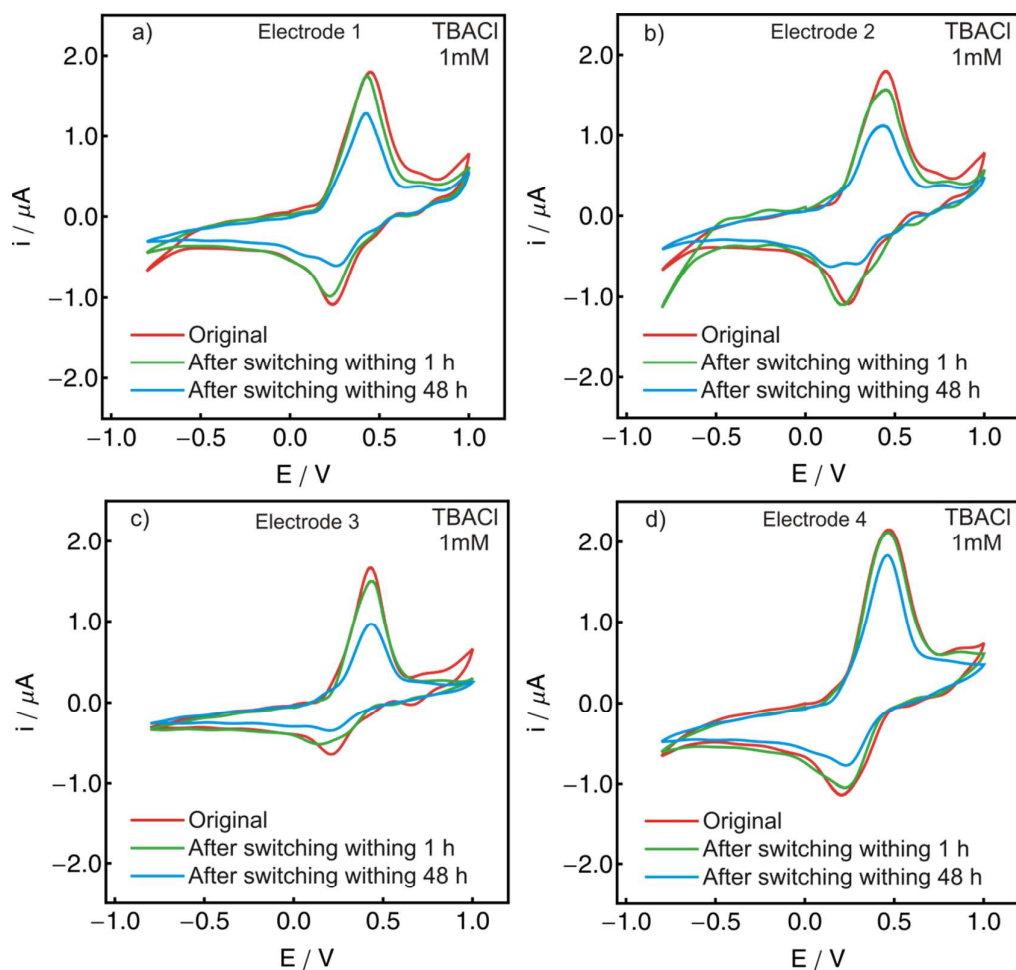


Figure S11. Cyclic voltammograms observed in 1mM TBACl solution before and after switching between cationic and anionic response for (a) electrode 1, (b) electrode 2, (c) electrode 3 and (d) electrode 4. Scan rate: $100 \text{ mV} \cdot \text{s}^{-1}$.

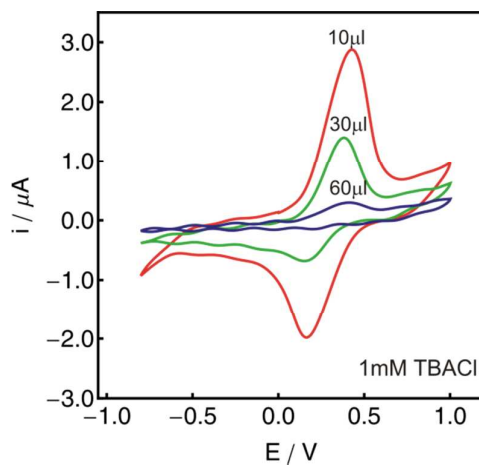


Figure S12. Cyclic voltammograms observed in 1mM TBACl solution for electrodes with 10, 30 and 60 μL of drop-cast POT solution. Scan rate: 100 mV·s⁻¹

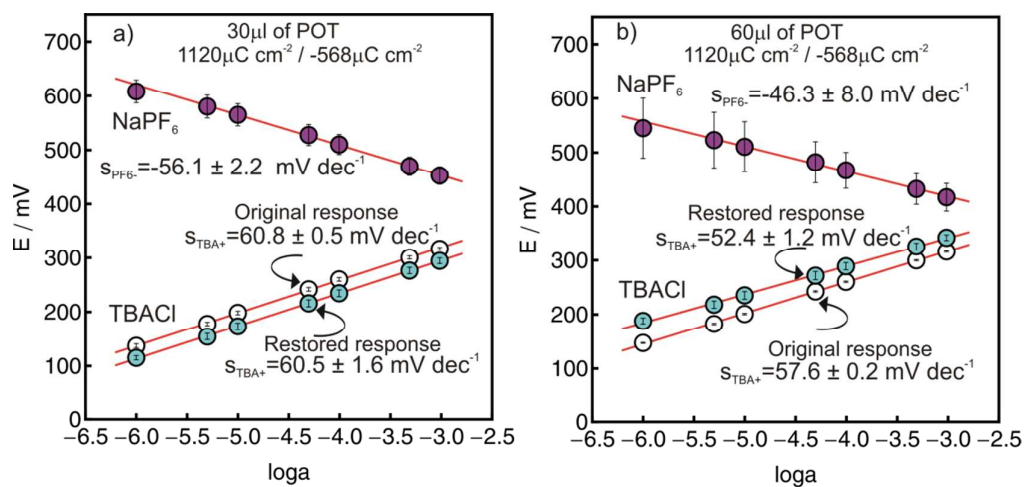


Figure S13. Potentiometric responses in NaPF₆ and TBACl solutions before and after applying oxidation/reduction current pulses of 140 μA cm⁻²/–71 μA cm⁻² for 8 s to electrodes with (a) 30 μL and (b) 60 μL of drop-cast POT solution. Error bars are standard deviations (n = 3).

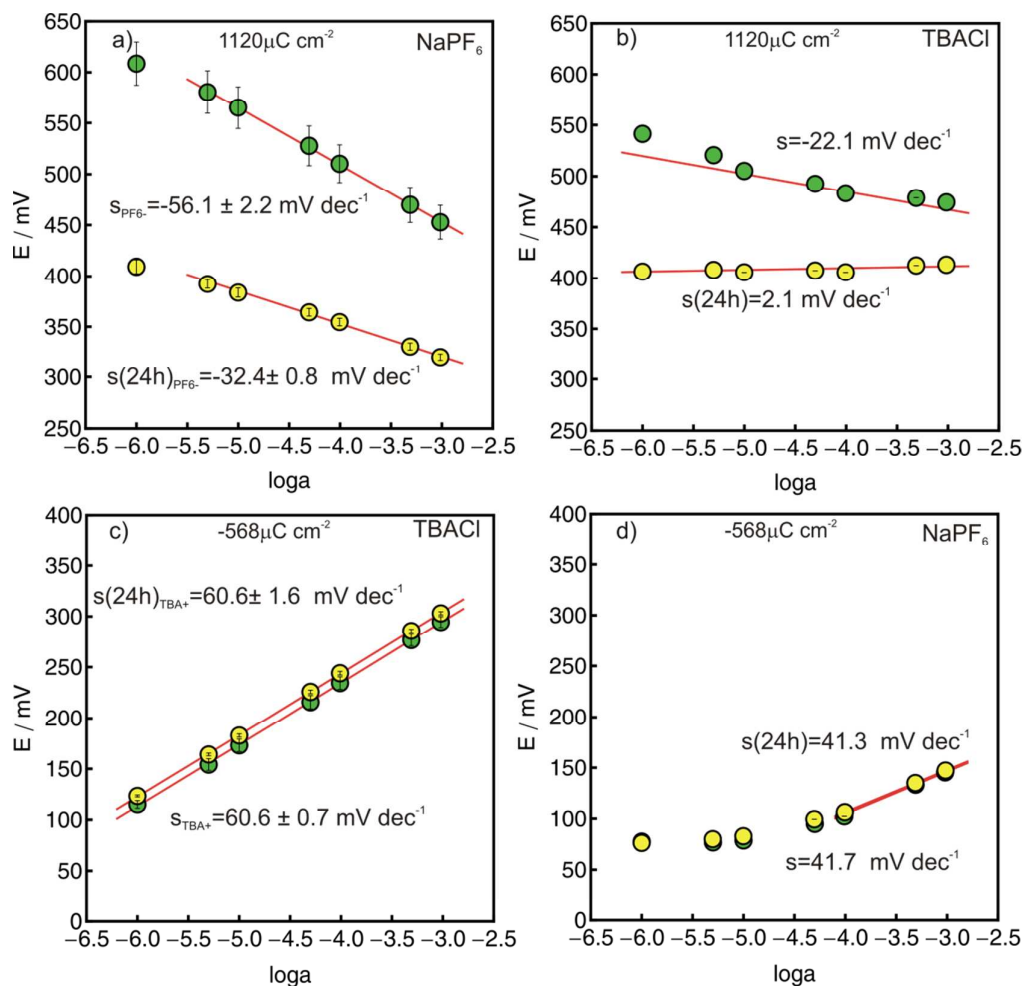


Figure S14. Potentiometric responses of electrode with 30 μL of drop-cast POT solution in (a) NaPF₆ and (b) TBACl solutions after applying oxidation current of 140 $\mu\text{A cm}^{-2}$ for 8 s and in (c) TBACl and (d) NaPF₆ solutions after applying reduction current of -71 $\mu\text{A cm}^{-2}$ for 8 s. Error bars are standard deviations ($n = 3$).

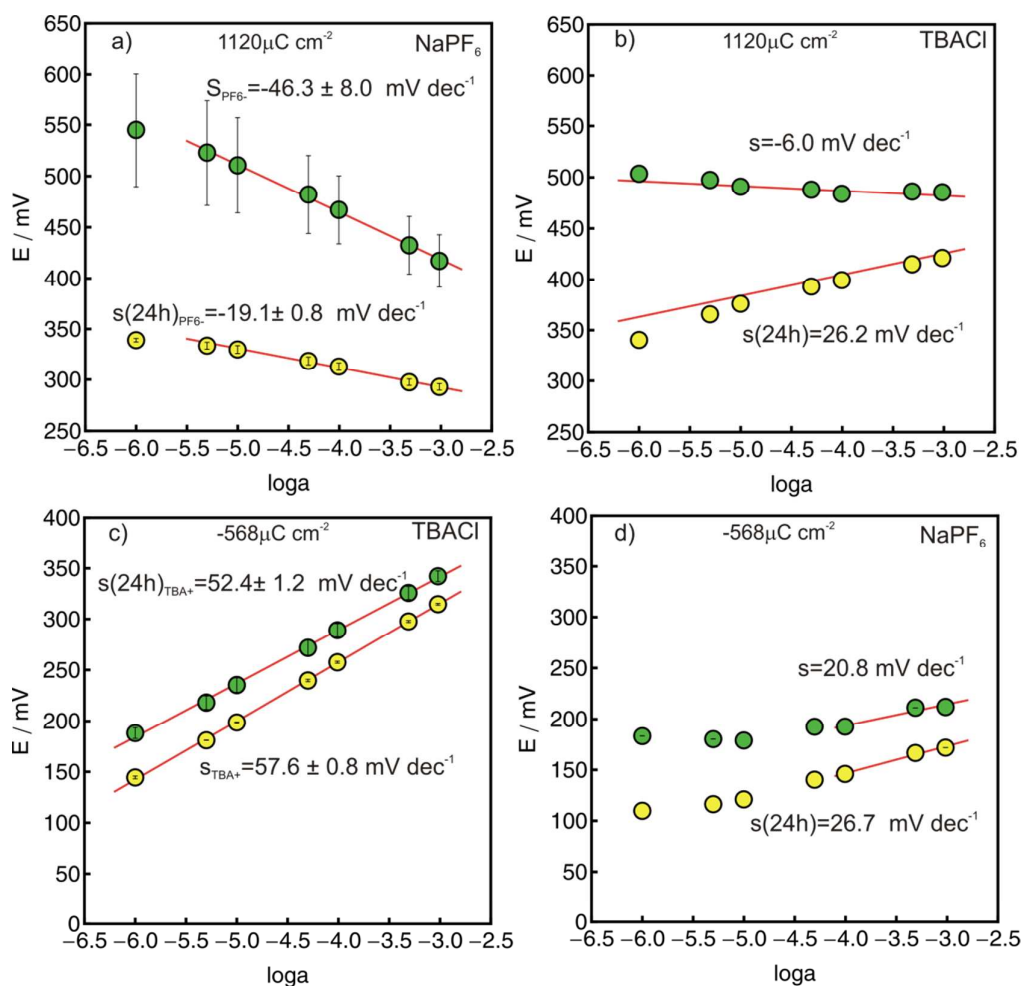


Figure S15. Potentiometric responses of electrode with 60 μL of drop-cast POT solution in (a) NaPF_6 and (b) TBACl solutions after applying oxidation current of $140 \mu\text{A}\cdot\text{cm}^{-2}$ for 8 s and in (c) TBACl and (d) NaPF_6 solutions after applying reduction current of $-71 \mu\text{A}\cdot\text{cm}^{-2}$ for 8 s. Error bars are standard deviations ($n = 3$).