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Supporting Information

Feasibility of a Supporting-Salt-Free Nonaqueous Redox Flow Battery Utilizing Ionic Active Materials

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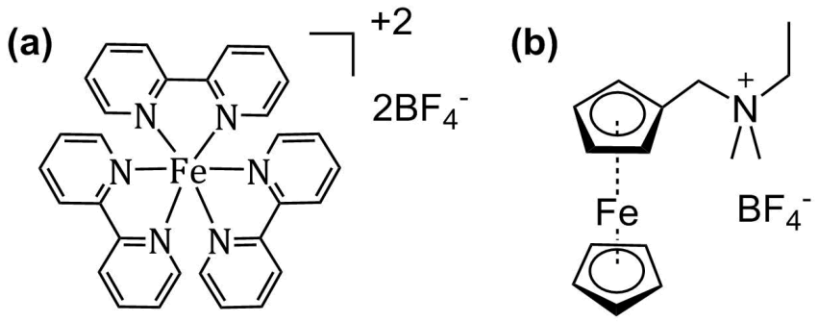

Figure S1: Structures of **(a)** iron(II) tris(2,2'-bipyridine) tetrafluoroborate ($Fe(bpy)_3(BF_4)_2$) and **(b)** ferrocenylmethyl dimethyl ethyl ammonium tetrafluoroborate ($Fc1N112\text{-}BF_4$).

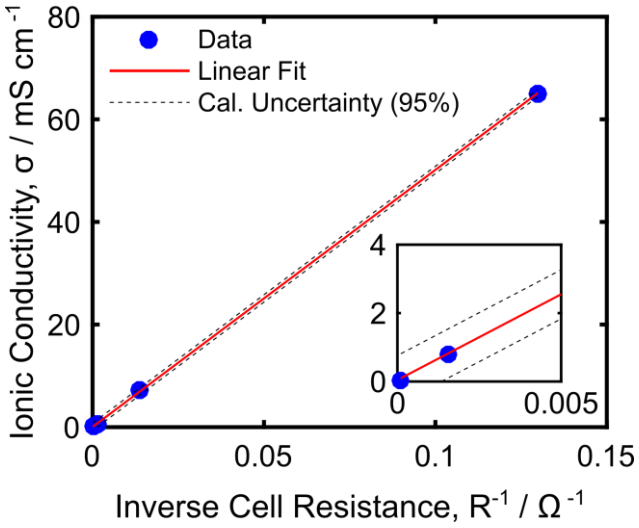

Figure S2: Conductivity cell 4-point calibration curve showing the raw cell resistance data (blue ●), the linear calibration curve (red solid line), and the range of uncertainty in the calibration curve (black dashed line), calculated from 95% confidence intervals. Inset: Expansion in the ionic conductivity range of 0 – 4 mS cm^{-1}.

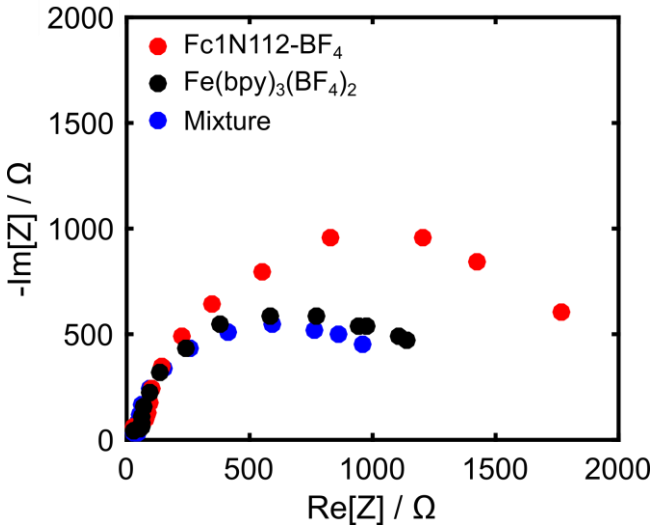

Figure S3: Nyquist plots for CV cells containing 5 mM $Fe(bpy)_3(BF_4)_2$, 5 mM Fc1N112-BF_4, and an equimolar mixture (10 mM total) in MeCN with no supporting salt.

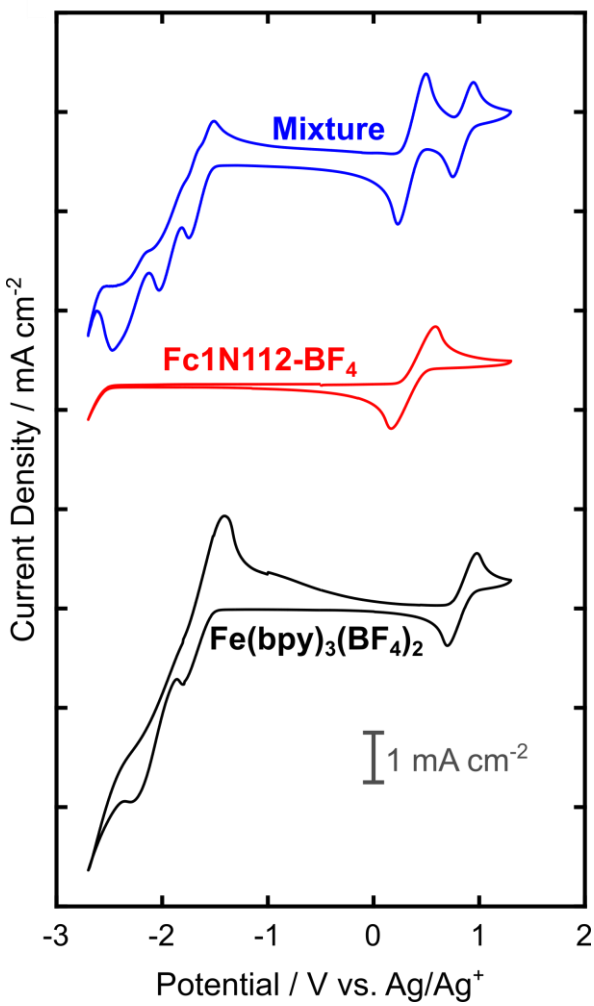

Figure S4: CVs of 5 mM $Fe(bpy)_3(BF_4)_2$, 5 mM Fc1N112-BF_4, and an equimolar mixture (10 mM total) of each active species in MeCN without supporting salt, across the entire redox active window of $Fe(bpy)_3(BF_4)_2$. CVs are not *i*R-corrected.

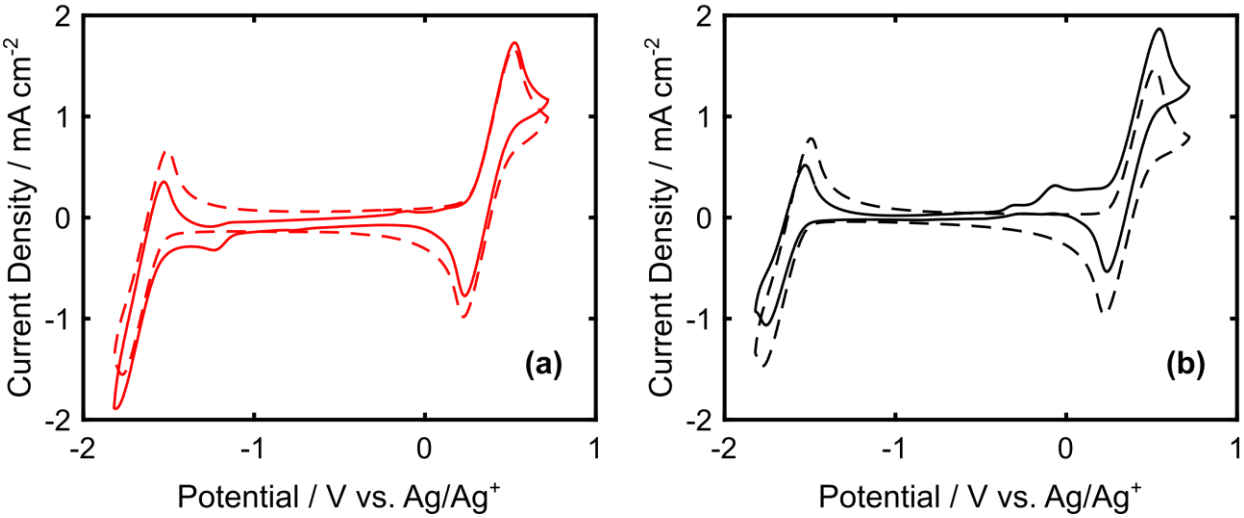

Figure S5: CVs before (dashed) and after (solid) 10 cycles in a bulk electrolysis cell for an equimolar mixture (10 mM total) of $Fe(bpy)_3(BF_4)_2$ and Fc1N112-BF_4, through a single **(a)** positive and **(b)** negative electron transfer. CVs are not *i*R-corrected.

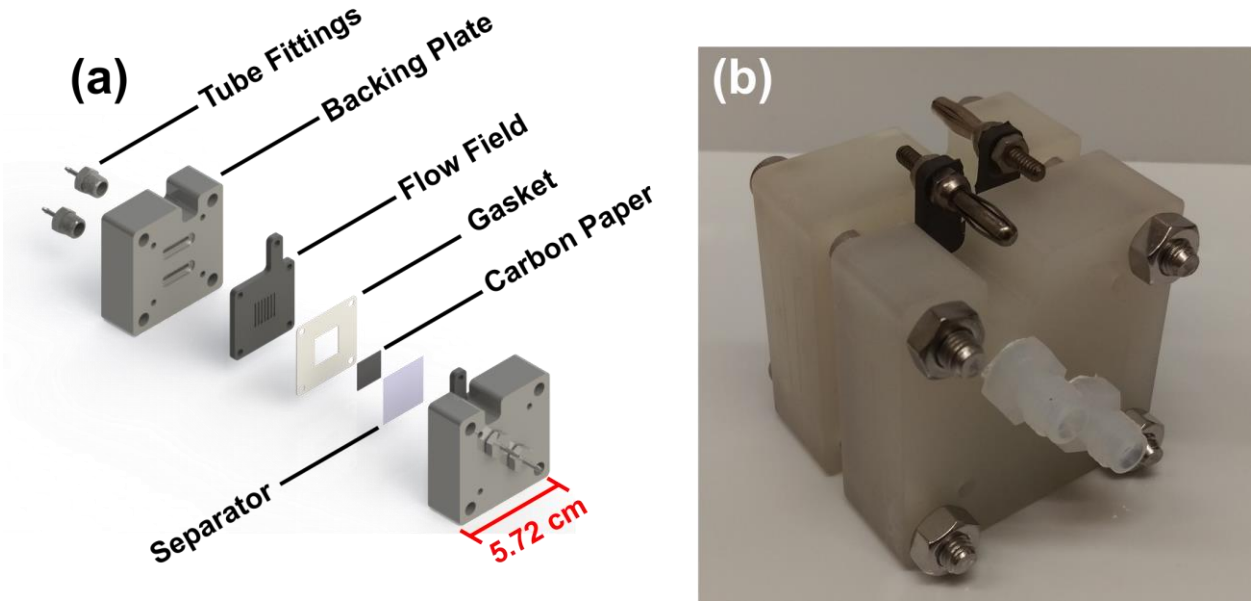

Figure S6: (a) Exploded view schematic of the flow cell and **(b)** photograph of the assembled flow cell.

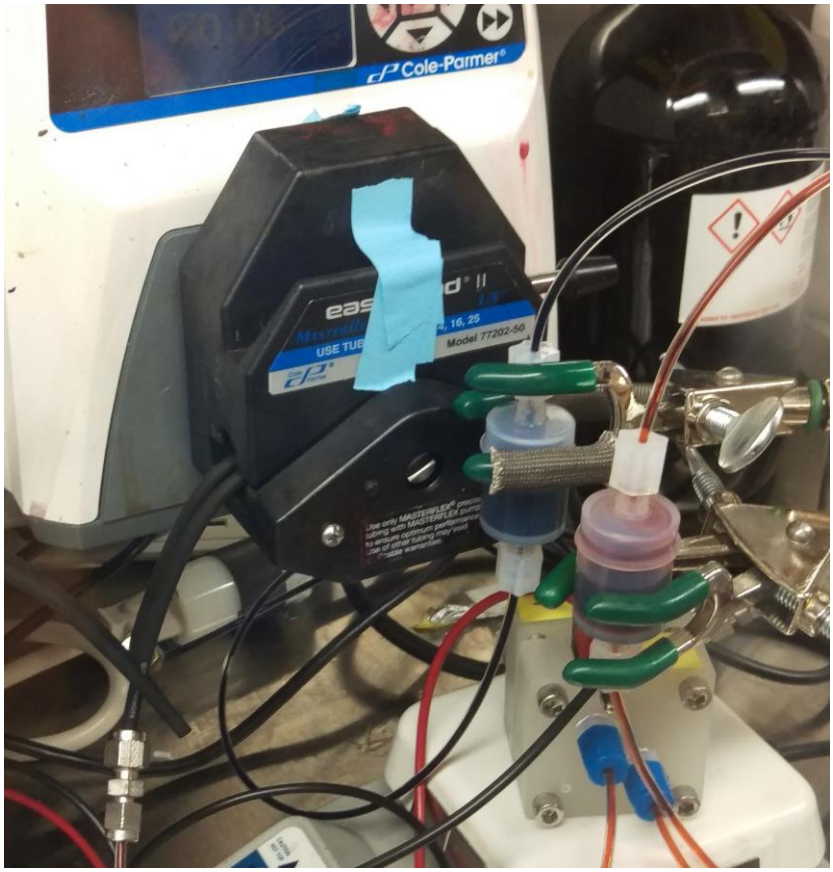

Figure S7: Photograph of the assembled and connected flow cell inside the glove box. In this photograph, the cell is charging, where the negolyte stream is red, and the posolyte stream is dark blue.