

Electronic Supplementary Information (ESI) for:

Bio-inspired Protonic Memristor Devices Based on Metal Complexes with Proton-Coupled Electron Transfer

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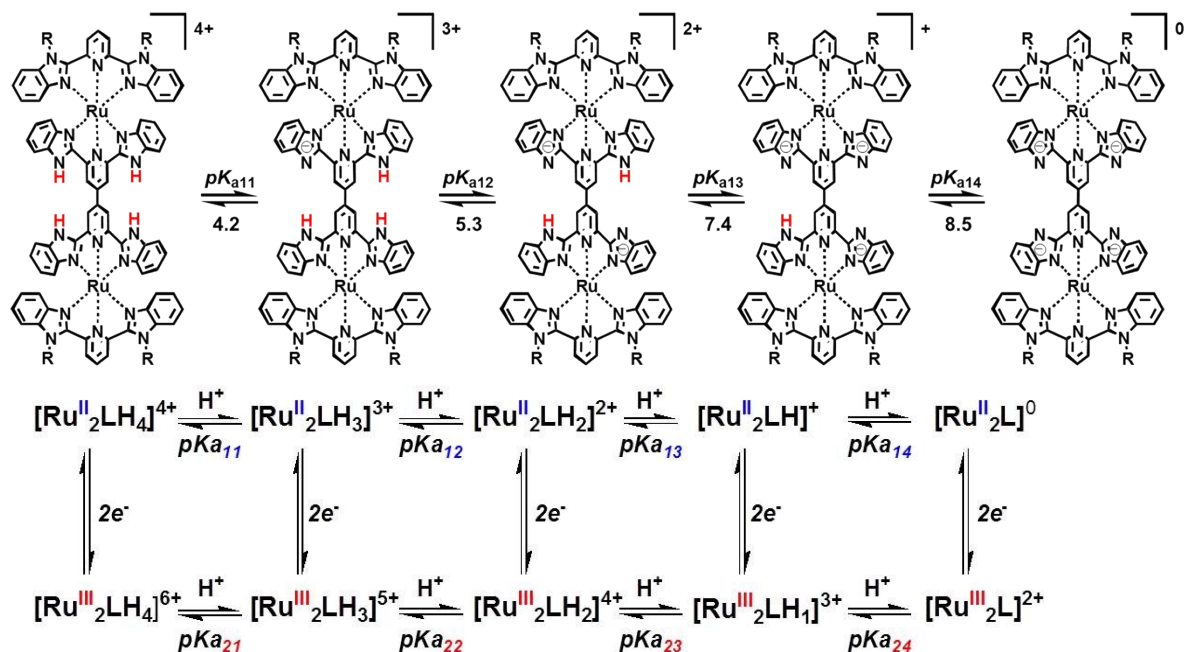
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List of Electronic Supporting Information (ESI)

1. Proton electron transfer equilibria in the Ru complex **RuNH-OH**
2. AFM images for the ITO surface with RCA treatment and the ITO modified by 5 layered **RuNH-OH** LbL film
3. Summary of contact angle measurements
4. *I-V* plots for various combination of two-terminal devices.

1. Proton electron transfer equilibria in the Ru complex RuNH-OH

Scheme S1. Proton electron transfer equilibria in the Ru complex **RuNH-OH**. (Reprinted with permission from ref. 36. Copyright 2018 American Chemical Society)



2. AFM images for the ITO surface with RCA treatment and the ITO modified by 5 layered RuNH-OH LbL film

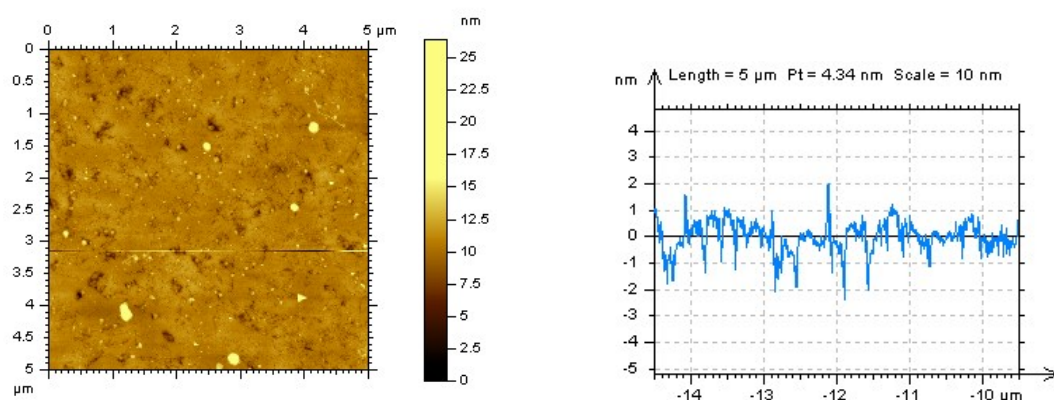


Figure S1. AFM image for the ITO surface after RCA treatment ($5 \times 5 \mu\text{m}$)

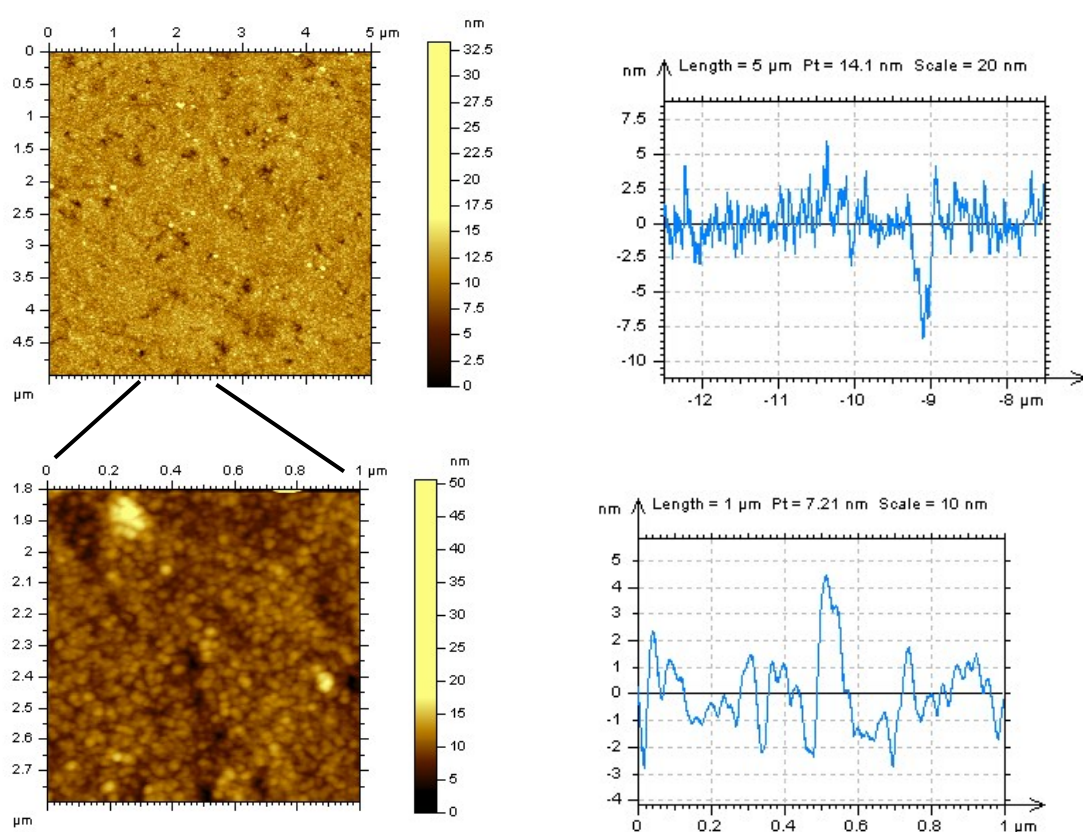


Figure S2. AFM image for the ITO surface modified by 5 layered RuNH LbL complexes (5×5 μm and 1×1 μm scale)

3. Summary of contact angle measurements

Table.S1. Summary of contact angle measurements for bare ITO and the modified ITO electrodes of ITO|(RuLbL film) and ITO|(RuLbL film)/P4VP at room temperature and their photographs

ITO	Bare (RCA treatment)	ITO (RuCH-OH) ₃	ITO (RuNH-OH) ₃	ITO (RuCH-OH) ₃ /P4VP	ITO (RuNH-OH) ₃ /P4VP
C. A. [deg.]	40.7±1.2	78.4±2.9	75.5±2.0	65.2±0.7	66.1±0.6

4. I - V plots for various combination of two-terminal devices.

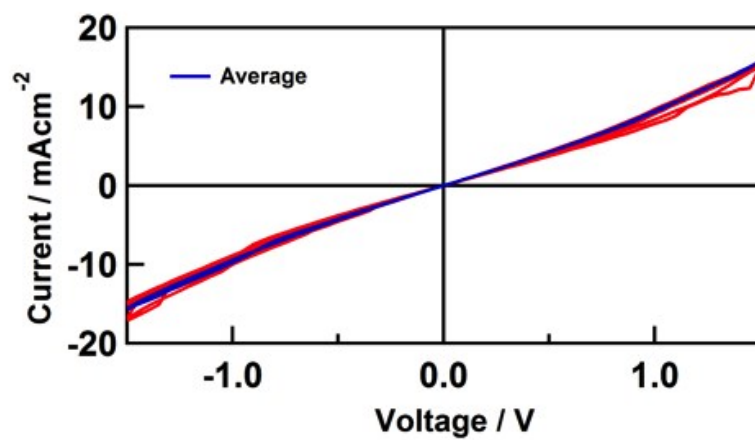


Figure S3. I - V plots of ITO|(RuNH-OH)₃/(RuCH-OH)₃|ITO without P4VP polymer layer

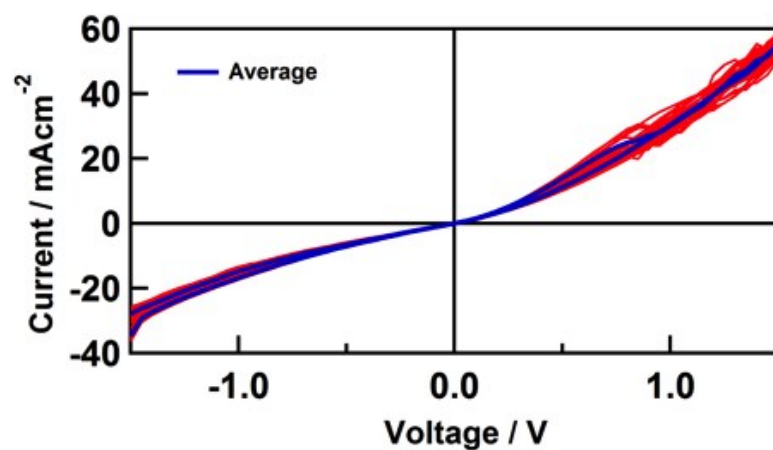


Figure S4. I - V plots of ITO|(RuCH-OH)₃/(RuNH-OH)₃|PEDOT without P4VP polymer layer

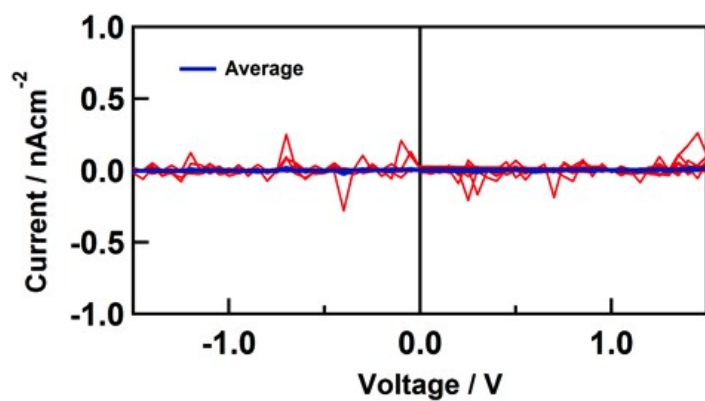


Figure S5. I - V plots of ITO|(RuNMe-OH)₃/P4VP/(RuCMe-OH)₃|ITO

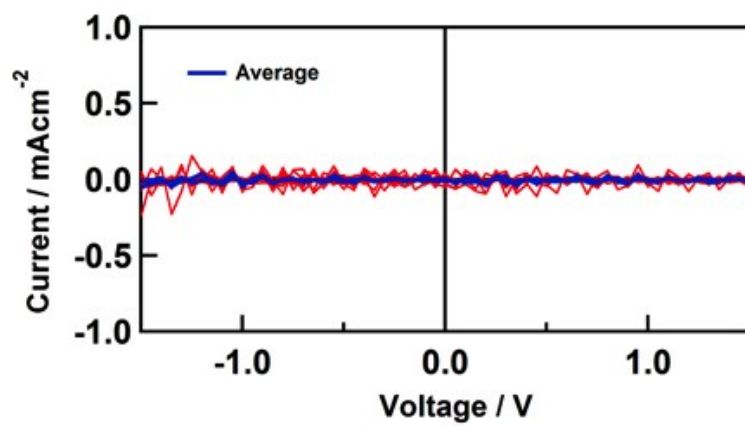


Figure S6. I - V plots of ITO|(RuCH-OH)₃/P4VP|ITO

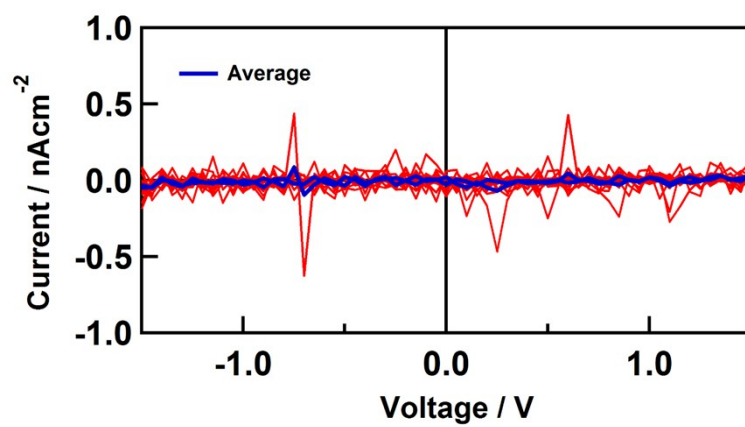


Figure S7. I - V plots of ITO|(RuNH-OH)₃/P4VP|ITO

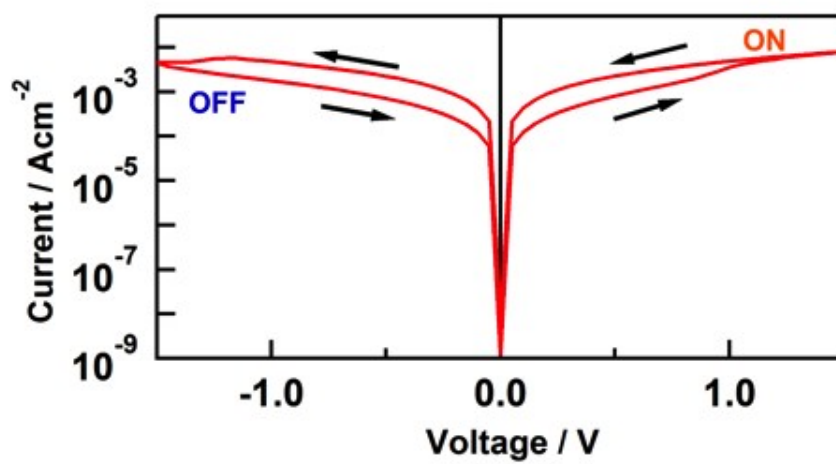


Figure S8. Semi-log I - V plots of ITO|(RuNH-OH)₃/P4VP/(RuCH-OH)₃|ITO for the average of 10 different devices as shown in Fig. 8 in the manuscript.