Supplementary Information

Electric-stimulus-responsive Multilayer Film Based on a Cobaltocenium-containing Polymer

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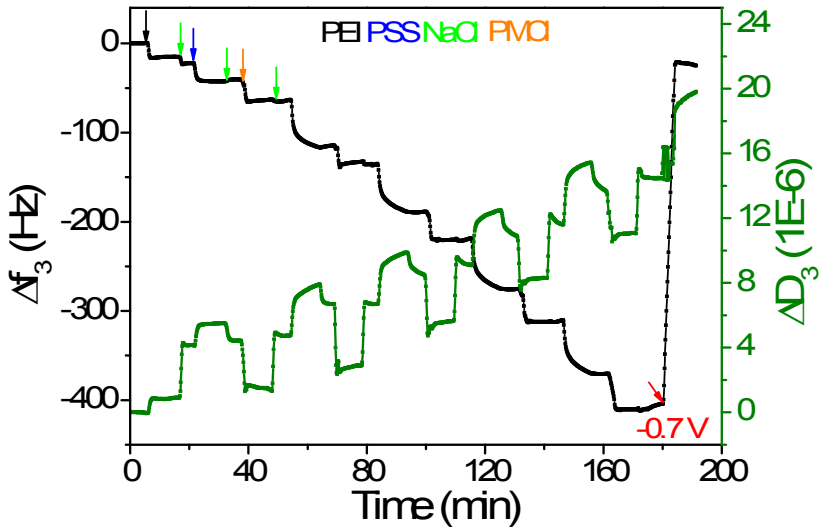

Figure S1. QCM frequency shift and dissipation associated with construction of a $(PSS/PMCl)_5$ PEM and its disassembly triggered by a -0.7 V potential. The small $\Delta D_n/\Delta f_n$ ratio indicates that the PEM is rigid.

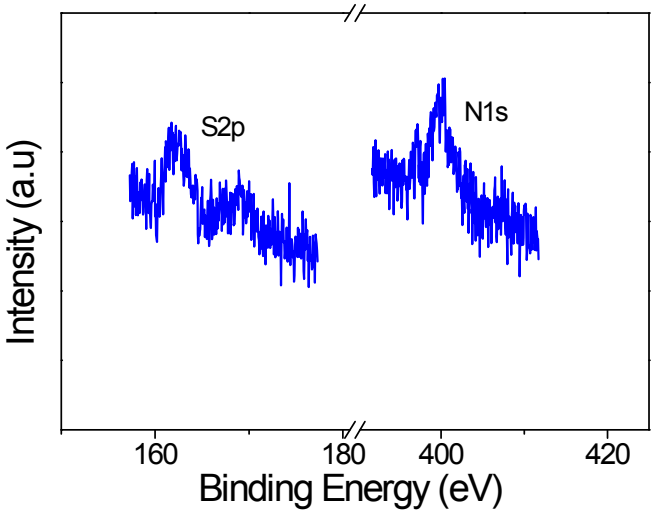

Figure S2. XPS spectrum in the S2p and N1s regions of a $(PSS/PMCl)_5$ PEM assembled on Au substrate with a PEI primer layer after treated with a -0.7 V electric potential.

The electron transfer number Z is calculated according to Faraday's Law of Electrolysis,

$$Z = \frac{Q}{NF}$$

From Figure 6, $\Delta f_{(PMCl)}$=135.4 Hz, $\Delta m_{(PMCl)}$=1.23 μg; $M_{(PMCl)}$=448 g mol^{-1}, so N=1.23/448=2.74 nmol

from Figure 2a, Q=2.8×10^{-4} C

therefore, $$Z = \frac{2.8 \times 10^{-4}}{96500 \times 2.74 \times 10^{-9}} = 1.06$$