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)$_3$ 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)$_3$ 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 $N = \frac{1.23}{448} = 2.74$ nmol

from Figure 2a, $Q = 2.8 \times 10^{-4}$ C

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

therefore,