

Efficient Electrochemomechanical Energy Conversion in Nanochannels Grafted with End-charged Polyelectrolyte Brushes at Medium and High Salt Concentration – Supporting Information

Guang Chen, Harnoor Singh Sachar, and Siddhartha Das*

Department of Mechanical Engineering, University of Maryland, College Park, MD-20742, USA

(Dated: June 6, 2018)

All the figures for the main paper are provided for a relatively small pressure gradient of 10^5 Pa/m. Consequently, the output power is relatively small. As has been discussed in the main paper, increase in pressure causes a quadratic increase in P_{out} . In Fig. S1, we provide

the variation of i_S , E_S , and P_{out} for a much enhanced pressure gradient of 5×10^8 Pa/m. While there is a distinct increase in magnitude of all the three quantities, the qualitative trend (with respect to the variation with c_∞ and the relative influence of the presence of the brushes) remains unchanged.

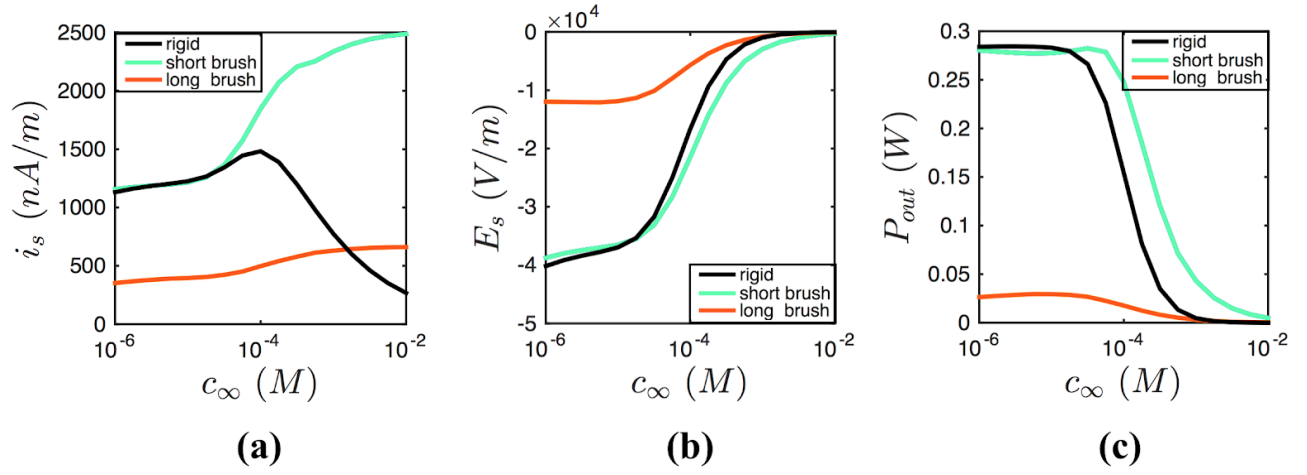


FIG. S1. Variation of (a) Streaming Current, (b) Streaming Potential and (c) Maximum Power output for a pressure gradient of 5×10^8 Pa/m. For (a-c), results are shown for Case 1 (brush-free nanochannels; shown in black and referred to as the “rigid” case), Case 2 (brush-grafted nanochannels, $N = 2000$, $\ell = 80$ nm; shown in green and referred to as “short brush” case), and Case 3 (brush-grafted nanochannels, $N = 2000$, $\ell = 22$ nm; shown in red and referred to as “long brush” case). All other parameters are identical to that considered in Fig. 9 in the main paper.