

Supporting Information for ‘Molecular Transport Through a Graphene Nanopore Capacitor’

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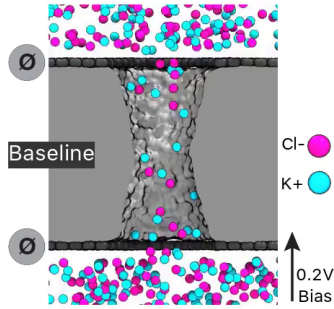
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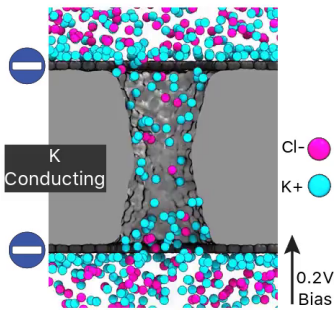
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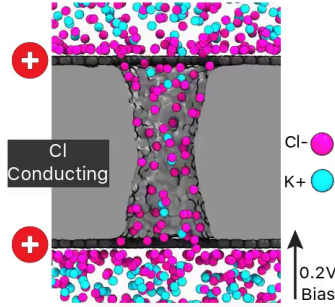
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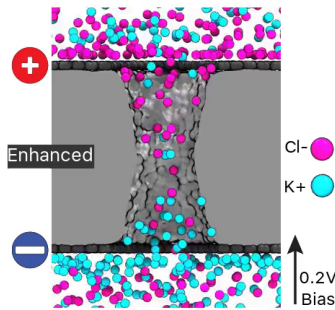
Animation S1: Ion transport through a baseline (uncharged) graphene nanopore capacitor with an applied transmembrane bias of 200 mV. The nanopore capacitor is shown in a cut-away representation, dark grey spheres represent carbon atoms comprising the graphene plates, a light gray surface represents the silica membrane, and purple and light blue spheres represent Cl^- and K^+ ions, respectively. The top and bottom graphene layers are electrically neutral ($\sigma_{\text{top}} = \sigma_{\text{bottom}} = 0 \text{ e nm}^{-2}$), which is schematically indicated by the dark grey circles. This animation shows the last 5 ns of the respective 25 ns MD trajectory.



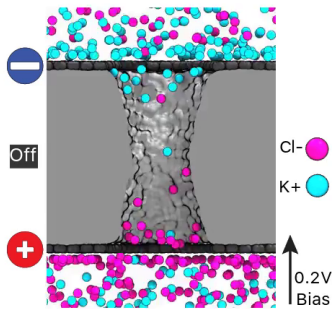
Animation S2: Ion transport through a K^+ conducting graphene nanopore capacitor with an applied transmembrane bias of 200 mV. The nanopore capacitor is shown in a cut-away representation, dark grey spheres represent carbon atoms comprising the graphene plates, a light gray surface represents the silica membrane, and purple and light blue spheres represent Cl^- and K^+ ions, respectively. The top and bottom graphene plates are negatively charged to $\sigma_{\text{bottom}} = \sigma_{\text{top}} = -2.0 \text{ e nm}^{-2}$ which is schematically illustrated by the blue circles. This animation shows the last 5 ns of the respective 25 ns MD trajectory.



Animation S3: Ion transport through a Cl^- conducting graphene nanopore capacitor with an applied transmembrane bias of 200 mV. The nanopore capacitor is shown in a cut-away representation, dark grey spheres represent carbon atoms comprising the graphene plates, a light gray surface represents the silica membrane, and purple and light blue spheres represent Cl^- and K^+ ions, respectively. The top and bottom graphene plates are positively charged to $\sigma_{\text{bottom}} = \sigma_{\text{top}} = -2.0 \text{ e nm}^{-2}$ which is schematically illustrated by the red circles. This animation shows the last 5 ns of the respective 25 ns MD trajectory.



Animation S4: Ion transport through an enhanced graphene nanopore capacitor with an applied transmembrane bias of 200 mV. The nanopore capacitor is shown in a cut-away representation, dark grey spheres represent carbon atoms comprising the graphene plates, a light gray surface represents the silica membrane, and purple and light blue spheres represent Cl^- and K^+ ions, respectively. The top and bottom graphene plates are oppositely charged: $\sigma_{\text{top}} = +2.0 \text{ e nm}^{-2}$ and $\sigma_{\text{bottom}} = -2.0 \text{ e nm}^{-2}$ which is illustrated by the red and blue circles. This animation shows the last 5 ns of the respective 25 ns MD trajectory.



Animation S5: Ion transport through an off-state graphene nanopore capacitor with an applied transmembrane bias of 200 mV. The nanopore capacitor is shown in a cut-away representation, dark grey spheres represent carbon atoms comprising the graphene plates, a light gray surface represents the silica membrane, and purple and light blue spheres represent Cl^- and K^+ ions, respectively. The top and bottom graphene plates are oppositely charged: $\sigma_{\text{top}} = -2.0 \text{ e nm}^{-2}$ and $\sigma_{\text{bottom}} = 2.0 \text{ e nm}^{-2}$ which is illustrated by the blue and red circles. This animation shows the last 5 ns of the respective 25 ns MD trajectory.