Supporting Information

Water Desalination by Electrical Resonance inside Carbon Nanotube

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(a) Flow (ns⁻¹) as a function of amplitude (e) when \( f \) is fixed at 13.3 THz.
(b) Flow (ns⁻¹) as a function of frequency when \( q_0 \) is fixed at 0.05 e. Dashed lines indicate the value of water flow inside a neutral CNT.

Fig. S 1 (a) Water flow as a function of \( q_0 \) when \( f \) is fixed at 13.3 THz. (b) Water flow as a function of \( f \) when \( q_0 \) is fixed at 0.05 e. Dashed lines indicate the value of water flow inside a neutral CNT.

(a) PMF of Cl⁻ when \( q_0 = 0.05 \) e.
(b) Energy barrier of Cl⁻ as a function of frequency when \( q_0 = 0.05 \) e. Dotted lines in (a) represent the position of CNT.

Fig. S 2 (a) PMF of Cl⁻ when \( q_0 = 0.05 \) e. (b) Energy barrier of Cl⁻ as a function of frequency when \( q_0 = 0.05 \) e. Dotted lines in (a) represent the position of CNT.
Fig. S 3 (a) Number density of hydrogen bond and (b) peak of RDF as a function of Z in (20,0) CNT with vibrational charge $q_0 = 0.05 \ e$ and $f = 13.3 \ THz$.

Fig. S 4 RDF of water around Na$^+$ in the case of $q_0 = 0.00 \ e$, $q_0 = 0.01 \ e$ and in bulk water. Inert shows a close view around the peak of RDF.

Fig. S 5 Comparison of energy barrier between TIP3P and TIP4P water models.
Fig. S6 (a) Ion flow inside (30,0) CNT as a function of \( q_0 \) when \( f \) is fixed at 13.3 THz. (b) Ion flow inside (30,0) CNT as a function of \( f \) when \( q_0 \) is fixed at 0.0667 e.