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Supplementary information

The dielectric decrements were calculated using molecular dynamics simulations, employing the GROMACS program package.[1] Each simulated system contained 783 water molecules, 14 sodium cations, and 14 anions, corresponding to 1M solution of NaF, NaCl, and NaOH. Water was constrained with SETTLE algorithm.[2] Production runs of 19 ns were carried out with a 2 fs time step after 1 ns of equilibration. The system was kept at pressure of 1 atm and temperature of 300 K using the Berendsen barostat and thermostat.[3] Barostat scaling time was 2 ps with compressibility of $4.5\ 10^{-5}$ bar^{-1}, while the thermostat time constant was set to 1.0 ps. The van der Waals and Coulomb interactions were cut-off at 1.1 nm and the long-range Coulomb interactions were accounted for using the Particle Mesh Ewald (PME) Method[4] with Fourier spacing grid of 0.12 nm. Details concerning calculation of free energy profiles of ions moving across the air/water interface are given in our previous study.[5] We just note here that the size of the unit cell, $3 \times 3 \times 9$ nm is large enough to make the interactions between periodic images of the aqueous slabs negligible.[6]

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