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Direct Observation of Charge Inversion by Multivalent Ions as a Universal Electrostatic Phenomenon SERGE LEMAY, KOEN BESTEMAN, MARCEL A. G. ZEVENBERGEN, HENDRIK A. HEERING, Kavli Institute of Nanoscience Delft — We have directly observed reversal of the polarity of charged surfaces in water upon the addition of trivalent and quadrivalent ions using atomic force microscopy. The bulk concentration of multivalent ions at which charge inversion reversibly occurs depends only very weakly on the chemical composition, surface structure, size, and lipophilicity of the ions. It is however very sensitive to the valence of the ions as well as the charge density of the surface and the dielectric constant of the solvent. These results support the theoretical proposal that spatial correlations between ions are the driving mechanism behind charge inversion. Ref: Phys. Rev. Lett. **93**, 170802 (2004).

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