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Electrolytes near structured dielectric interfaces HUANXIN WU, YUFEI JING, Northwestern University, FRANCISCO SOLIS, Arizona State University, MONICA OLVERA DE LA CRUZ, ERIK LUIJTEN, Northwestern University — The ion distribution in an electrolyte near a dielectric interface has important consequences for numerous applications. To date, most studies have focused on planar interfaces, where, e.g., simulations can take advantage of the image-charge method. However, for surfaces that display structure on the nanoscale, dielectric effects may be significantly different. Here, we investigate such interfaces via a combination of computer simulations and Poisson–Boltzmann theory. We demonstrate how, even for systems with piecewise uniform dielectric constant, surface structure affects the induced polarization charge as well as the ion distribution near the interface, in particular for asymmetric salts. We explore the role of ion concentration, dielectric mismatch and characteristic length scale of the surface structure.

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