

Abstract Submitted
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Interaction between surfaces with ionizable sites STEPHEN BARR,
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Princeton University — A key factor controlling the interaction between surfaces in
aqueous solutions is the surface charge density. Surfaces typically become charged
through a titration process where surface groups can become ionized based on their
dissociation constant and the pH of the solution. In this work we use a Monte Carlo
method to treat this process explicitly in a system with two planar surfaces in a
salt solution. We find that the surface charge density changes as the surfaces come
close to contact due to interactions between the ionizable groups on each surface. In
addition, we observe an attraction between the surfaces above a threshold surface
charge, in good agreement with previous theoretical predictions based on uniformly
charged surfaces. However, close to contact we find the force is significantly different
than the uniformly charged case. We also explore the role of salt concentration and
the density of the ionizable sites.

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