

Abstract Submitted
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Fluid properties in the electrical double layer-effect on streaming potential at charged interfaces ALEXANDER BARBATI, BRIAN KIRBY, Sibley School of Mechanical and Aerospace Engineering, Cornell University — Fluid properties in the electrical double layer are central to electrokinetic phenomena and affect interfacial measurement. We use a flat plate streaming potential apparatus to measure the interfacial potential of novel (and previously unmeasured) films with unique surface properties. The nature of the parallel plate geometry permits pre- or post-experiment measurement of surface properties (AFM, XPS, etc...) to further interrogate the surface structure. Analytical approximations and a numerical framework are used to directly compute experimental outcomes by combining potential and flow simulations to predict electrical currents generated by the convection of the ion distribution near the liquid-solid boundary; specifically we introduce electric field sensitive variation in the viscosity and permittivity to determine, quantitatively, property effects on linear electrokinetic measurements, with application to novel interfaces and liquids.

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