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Model colloid system for interfacial sorption kinetics PAUL SALIPANTE, STEVEN HUDSON, National Institute of Standards and Technology — Adsorption kinetics of nanometer scale molecules, such as proteins at interfaces, is usually determined through measurements of surface coverage. Their small size limits the ability to directly observe individual molecule behavior. To better understand the behavior of nanometer size molecules and the effect on interfacial kinetics, we use micron size colloids with a weak interfacial interaction potential as a model system. Thus, the interaction strength is comparable to many nanoscale systems (less than 10 k_BT). The colloid-interface interaction potential is tuned using a combination of depletion, electrostatic, and gravitational forces. The colloids transition between an entropically trapped adsorbed state and a desorbed state through Brownian motion. Observations are made using an LED-based Total Internal Reflection Microscopy (TIRM) setup. The observed adsorption and desorption rates are compared theoretical predictions based on the measured interaction potential and near wall particle diffusivity. This experimental system also allows for the study of more complex dynamics such as nonspherical colloids and collective effects at higher concentrations.

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