

217d Tirm of Ac Electrically Driven Motion of a Single Microparticle near Platinum and Indium-Tin-Oxide Electrodes

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Investigations of ac electrically-driven motion of a single polystyrene microparticle above an indium-tin-oxide (ITO) electrode using total internal reflection microscopy (TIRM) show an electrolyte dependence on the average height of the particle. This height, measured in oscillating electric fields with frequencies ranging from 40 Hz to 10 kHz, was different in 0.15 mM potassium hydroxide, sodium bicarbonate, and nitric acid solutions. Particles in potassium hydroxide were attracted towards the ITO electrode, repelled from the electrode in sodium bicarbonate, and attracted at low frequencies then repelled at frequencies greater than 300 Hz in nitric acid. These experiments were repeated above platinum electrodes and compared to the results above ITO electrodes to determine the effect of the electrode surface on these observed effects. The average height of a particle above a platinum electrode in a potassium chloride solution is also measured as a function of the frequency.