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Electrokinetic measurements of a model colloidal system in low polar solvents ANDREW HOLLINGSWORTH, WILLIAM RUSSEL, PAUL CHAIKIN, Princeton University, MIRJAM LEUNISSEN, ALFONS VAN BLAADEREN¹, Utrecht University, PRINCETON UNIVERSITY COLLABORATION, UTRECHT UNIVERSITY COLLABORATION — In a low polar environment, sterically stabilized poly(methyl methacrylate) spheres become positively charged and exhibit significant long-range repulsive interactions. Particles were fluorescently labeled for confocal microscopy and suspended in near index and density matching solvents. Calculations show that small differences in the dielectric constant, which ranged from 6 to 8 in our experiments, can dramatically affect electrolyte dissociation. We have computed ionic strengths from conductivity measurements using Fuoss' theory of ionic association, and, in turn, interpreted electrophoretic mobility and dielectric response using the standard electrokinetic model. We hypothesize that the dehydrohalogenation of cyclohexyl bromide (CHB) produces HBr, which weakly dissociates in these organic solvents. To establish the acidic nature of the media, we dissolved CHB in water and measured the conductivity and pH as a function of CHB concentration and time.

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