

Abstract Submitted
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Faraday Effect in Magnetic and Non-Magnetic Colloidal Nanoparticles in Water CONSTANTINE FARAH, SERKAN ZORBA¹, THOMAS MAXWELL, Whittier College, YADONG YIN², L. HE, M. YE, University of California Riverside — We have investigated Faraday Effect in a variety of nanoparticle solutions. Verdet constant of superparamagnetic nanocrystal clusters of magnetite (Fe₃O₄), diluted in water, is measured as a function of particle size. Particle sizes ranging from 3 to 210 nm, resulted in a nonlinear size dependence in Verdet constant. The relationship between Verdet constant and particle size is possibly due to variation in magnetic domain sizes within the particles. Domain size evolution investigations are underway using X-ray diffraction. Non-magnetic nanoparticle solutions investigated consisted of silver, silver oxide, magnesium oxide, nickel oxide, and carbon nanotubes. Solutions demonstrated diamagnetic and paramagnetic properties, as expected. We believe that Faraday Effect is an efficient method of investigating magnetic properties of nanoparticles.

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