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Electric field dependent dielectric response of alumina/silicone oil colloids LOUIS MAGALLON, STEPHEN TSUI, California State University San Marcos — We investigate the dielectric response of a mixture of alumina nanopowder and silicone oil. Frequency and electric field dependent measurements of another insulating colloid, i.e., urea-coated $Ba_{0.8}Rb_{0.4}TiO(C_2O_4)_2$ nanoparticles immersed in silicone oil, revealed universal dielectric response (UDR) characteristics and, with the application of high voltage, a negative capacitance. Alumina in silicone oil represents a simpler system in which to perform similar dielectric investigation. This colloid is sandwiched in a parallel plate capacitor cell, and the complex impedance is measured via lock-in amplifier at various frequencies and applied dc biases. Furthermore, we will compare and discuss the dielectric behaviors of different sized suspended alumina particles.

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