

Abstract Submitted
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Viscous properties of aluminum oxide nanotubes and aluminum oxide nanoparticles - silicone oil suspensions¹ RAM THAPA, STEVEN FRENCH, ADRIAN DELGADO, CARLOS RAMOS, JOSE GUTIERREZ, MIRCEA CHIPARA, KAREN LOZANO, The University of Texas - Pan American — Electrorheological (ER) fluids consisting of γ -aluminum oxide nanotubes and γ -aluminum oxide nanoparticles dispersed within silicone oil were prepared. The relationship between shear stress and shear rate was measured and theoretically simulated by using an extended Bingham model for both the rheological and electrorheological features of these systems. Shear stress and viscosity showed a sharp increase for the aluminum oxide nanotubes suspensions subjected to applied electric fields whereas aluminum oxide nanoparticles suspensions showed a moderate change. It was found that the transition from liquid to solid state (mediated by the applied electric field) can be described by a power law and that for low applied voltages the relationship is almost linear.

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