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In this presentation, we study the fully developed flow of a cement slurry in a vertical pipe and explore the effects of concentration on the shear viscosity. A brief discussion of the constitutive relations for the viscous stress tensor and the diffusion flux vector is presented. The one-dimensional forms of the governing equations and the boundary conditions are made dimensionless and solved numerically. A parametric study is performed to present the results by varying the dimensionless numbers. (Received September 05, 2018)