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Experiments on chemically enhanced immiscible fluid displacements[1] TEJASWI SOORI, THOMAS WARD, Iowa State Univ — This talk focuses on experiments conducted by displacing a vegetable oil within a capillary tube (diameter < 1 mm) using an aqueous alkali solution. Estimates of the residual film were measured as a function of Reynolds (Re), viscous Atwood (At) and capillary (Ca) numbers. The pendant drop method was used to measure surface tension of the aqueous alkali solutions. We observed a decrease in surface tension for an increase in alkali concentration, which beyond a critical concentration forms a stable micro-emulsion. We estimate the shear viscosity of the emulsion as a function of alkali and aqueous/oil concentrations. Separately we attempt to measure the average bulk diffusion coefficient of the emulsion in both phases which is necessary to estimate the Péclet number (Pé) and subsequent mass transport phenomena.

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Tejaswi Soori
Iowa State Univ

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