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Creeping motion of a deformable drop or bubble near an inclined wall ANDREW GRIGGS, ALEXANDER ZINCHENKO, ROBERT DAVIS, Department of Chemical and Biological Engineering, University of Colorado at Boulder — Experiments were conducted to investigate the gravity-driven motion of a deformable drop or bubble through a viscous liquid in the vicinity of an inclined wall at low-Reynolds number. We study the steady-state drop/bubble velocity as a function of the Bond number, drop-to-medium viscosity ratio, and the wall inclination angle. The drop/bubble is able to approach the wall very closely (to less than 1 percent of the drop radius) in steady motion, even for moderate Bond numbers. The steady drop velocities increase with increasing Bond number and decreasing viscosity ratio for small inclination angles (i.e. less than 15 degrees above horizontal). Viscous drops maintain smaller separations and deform more than bubbles at fixed Bond number over a large range of inclination angles. Experimental results are compared with boundary-integral calculations for an extensive portion of the parameter space.

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