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Coalescence of liquid drops is governed by surface tension driven capillary pressure in the inertial regime MD MAHMUDUR RAHMAN, Univ of Nebraska - Lincoln — Droplet coalescence is a complex hydrodynamic phenomenon where it has been thought that, at the moment of contact, a singularity occurs due to the inversion of one of its two radii of curvature. However, the effect of this singularity cannot be observed experimentally through coalescence of liquid drops in three dimensions. A recent study examined coalescence mathematically in the inertial regime where no such singularity is assumed. After coalescence happens in the "viscous" regime, hydrodynamic scaling starts working with a certain bridge radius other than a singular point. In our experimental analysis, we studied coalescence in a confined geometry where drops were sandwiched in the Hele-Shaw cell. We observed very well defined mixing interface which signifies that early coalescence ('viscous' regime) is not a hydrodynamic phenomenon, rather its characteristics may be evaluated from molecular dynamics analysis. Our experiment will be helpful in studying coalescence of liquid drops in any given shape through mathematical modeling where initial bridge radius can be assumed or determined through other means.

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