

Abstract Submitted
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Motion and coalescence of sessile drops driven by substrate wetting gradient and external flow MAJID AHMADLOUYDARAB, JAMES J. FENG, Chemical & Biological Engineering Department - UBC — We report finite-element simulations of the motion and coalescence of sessile drops driven by solid substrate wetting gradient and external flow. When the external flow and wetting gradient favor motion in opposite directions, their competition determines the behavior of a single sessile drop. If two drops are placed on a solid substrate with wetting gradient, the trailing drop may catch up with the leading one and coalesce with it. This is owing to the greater viscous friction on the leading drop, which is more spread out on a more hydrophobic area of the substrate. An external flow alone can induce coalescence, thanks to differential drags on the two drops. When both wetting gradient and flow effects coexist and compete, more complex scenarios arise, with either coalescence or separation depending on the strength of each.

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