Abstract Submitted
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Instabilities of an immiscible reactive micellar interface in a Hele-Shaw cell ZAHRA NIROOBAKHSH, Dept of Materials Science and Engineering, Pennsylvania State University, MATTHEW LITMAN, Dept of Mathematics, Pennsylvania State University, ANDREW BELMONTE, Dept of Mathematics/Materials Science and Engineering, Pennsylvania State University — We present the case of a micellar reaction involving two immiscible fluids, which results in the growth of a thin viscoelastic layer between them. A Hele-Shaw cell is initially filled with different oils, including oleic acid, which acts as a cosurfactant. The oil is displaced by an aqueous solution of the surfactant cetylpyridinium chloride. A rich variety of viscous fingering patterns are observed, which are different from classic Saffman-Taylor patterns. We discuss how they change with concentration, surfactant injection rate and type of oil. We also measure the viscoelastic properties of this material using an interfacial rheometer.

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