

Abstract Submitted
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Influence of interfacial tension on viscous multiphase flows in coaxial microchannels THAI DINH, THOMAS CUBAUD, Stony Brook University — The role of interfacial tension on liquid/liquid microfluidic flows is experimentally investigated for fluid pairs having similar viscosity contrasts. A coaxial microdevice is employed to examine the situation where a less viscous fluid is injected in a sheath of a more viscous fluid using both immiscible and miscible fluid pairs. Data obtained from high-speed imaging show a variety of regular flow patterns, including dripping, jetting, and core-annular flows, as well as less familiar flow regimes, such as wavy, mist, and inverted flows patterns. Flow maps are delineated over a wide range of injection flow rates to clarify the relationship between flow transition and fluid properties. In particular, interfacial tension is shown to affect the morphology and dynamics of flow patterns at different ranges of flow rates.

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