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Marangoni-driven Spreading along Liquid-Liquid Interfaces STEFFEN BERG, Shell International Exploration and Production B.V. — Marangoni-driven spreading has been studied extensively at gas-liquid interfaces but so far the spreading kinetics along the interface between immiscible liquids has not been investigated systematically. For a demonstration of the mechanism the spreading kinetics of aqueous surfactant solutions along the interface between water and decane is measured experimentally using laser shadowgraphy. The leading edge follows a power law where the radius r as function of time t scales as $r(t) \propto t^{3/4}$. Ater extending the existing model for spreading at air-liquid interfaces by taking the viscous dissipation in both fluid layers below and above the interface into account, quantitative agreement between experimental data and the model is obtained. Marangoni-driven spreading along an interface is a fast transport mechanism. The velocity of the leading edge is in the range of group velocities of capillary waves.

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