

Abstract Submitted
for the DFD05 Meeting of
The American Physical Society

Fingering of interfacial micellar gels ANDREW BELMONTE, Pritchard Labs, Penn State, THOMAS PODGORSKI, Univ J Fourier - Grenoble, MICHAEL SOSTARECZ, Pritchard Labs, Penn State, SYLVAIN ZORMAN, Univ J Fourier - Grenoble — We present an experimental study of the instabilities of a gel-like material which forms at the interface between two aqueous solutions of a surfactant and an organic salt in a Hele-Shaw cell; these two solutions will form a highly elastic micellar fluid when mixed homogeneously. By injecting one fluid into the other at different rates, a variety of fingering patterns are observed in both radial and linear geometries. Because the interfacial gel thickens with time, rapidly moving fronts are stable, and instabilities occur only for slower flows. We observe a regime of unconfined stationary or wavy fingers for which width selection seems to occur independent of the bounding walls, unlike the Saffman-Taylor fingering case.

Andrew Belmonte
Pritchard Labs, Dept of Mathematics, Penn State University

Date submitted: 11 Aug 2005

Electronic form version 1.4