

Abstract Submitted  
for the DFD12 Meeting of  
The American Physical Society

**Viscous fingering with production of surfactant by chemical reaction in a Hele-Shaw cell** MASANARI FUJIMURA, YUICHIRO NAGASTU, Tokyo University of Agriculture and Technology — Viscous fingering experiments have been performed in a radial Hele-Shaw cell for a liquid–liquid system in the presence of a chemical reaction which produces a surfactant. The reaction is a neutralization of a fatty acid by an alkaline material to form a surfactant. Viscous fingering experiments employing the chemical recipe were previously performed by several researchers. The present experiments were done in wider range of the reactant concentrations and the flow rate. Experimental results showed that the reaction made viscous fingers thinner for low flow rate whereas wider for high flow rate in the condition of low reactant concentrations. The reaction made the fingers wider for low reactant concentrations whereas thinner for high reactant concentration in the condition of high flow rate. In summary, we have found the opposite effects of the reaction on the finger width depending on flow rate in the low reactant concentration and depending on reactant concentrations in the high flow rate by employing the wide range of experimental conditions.

Masanari Fujimura  
Tokyo University of Agriculture and Technology

Date submitted: 03 Aug 2012

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