

Abstract Submitted  
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**Characteristics of miscible viscous fingering involving liquid viscosity changes due to variations in chemical species concentrations by chemical reaction** YUICHIRO NAGATSU, KENJI MATSUDA, YOSHIHITO KATO, YUTAKA TADA, Department of Material Engineering, Graduate School of Engineering, Nagoya Institute of Technology — Reactive miscible viscous fingering occurs when a reactive and miscible less-viscous liquid displaces a more-viscous liquid in a Hele-Shaw cell. In the present study, we have succeeded to experimentally show reactive miscible viscous fingering in a Hele-Shaw cell involving changes of displaced liquid viscosity due to variations in chemical species concentrations by chemical reaction by making use of dependence of viscosity of polymer solution on pH. When the displaced liquid viscosity is increased by the reaction, a fractal dimension of miscible viscous fingering pattern with the reaction is larger than that without the reaction. In contrast, when the displaced liquid viscosity is decreased by the reaction, the fractal dimension of miscible viscous fingering pattern with the reaction is smaller than that without the reaction. A physical model to explain these changes of fingering pattern by the reaction is proposed.

Yuichiro Nagatsu  
Department of Material Engineering, Graduate School of Engineering  
Nagoya Institute of Technology

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