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Reaction characteristics of miscible displacement in vertical capillary tubes YUJI HOSOKAWA, YUICHIRO NAGATSU, YOSHIHITO KATO, YUTAKA TADA, Ngoya Institute of Technology — It is known that the spike is formed in the miscible displacement in capillary tubes under a certain condition. In the present study, miscible displacement with chemical reaction in vertical capillary tubes is investigated experimentally in the condition where the spike is formed. The effect of reactant concentration on the reaction characteristics is focused on. We have found that the initial reactant concentration ratio included in the more- and less-viscous liquids normalized by the stoichiometric ratio of the chemical reaction, ϕ, significantly influences the distribution of the products. When the reactant contained in the more-viscous liquid is much more concentrated than that in stoichiometry; $\phi << 1$, the product is scarcely distributed inside the spike. In contrast, when the reactant contained in the less-viscous liquid is much more concentrated than that in stoichiometry; $\phi >> 1$, the product is obviously distributed inside the spike. We propose that the difference in the product distribution is caused by both two factors; the idiosyncratic shape (spike) of boundary region and the difference between the diffusion coefficient of interdiffusion of miscible two liquids and that of reactants in less viscous liquid.

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