Abstract Submitted
for the DFD09 Meeting of
The American Physical Society

Measurement of concentration filed in miscible displacement in a thin gap by means of microelectrode YUICHIRO NAGATSU, TAKASHI OGAWA, YOSHIHITO KATO, YUTAKA TADA, Nagoya Institute of Technology, Japan — When a miscible less-viscous liquid displaces a more-viscous one in a Hele-Shaw cell (a thin gap between two parallel plates, normally the gap width is less than 1 mm), it is known that a thickness of the less-viscous liquid's layer is expected to abruptly become small in a relatively long distance near the displacement front under a certain condition. We call this a sheet structure. The objective of the present study is to experimentally measure concentration profiles in the cell's gap direction to examine the expectation. However, because of the minuteness of the measured space, it is difficult to measure it by existing measurement techniques. In the present study, therefore, we attempt to measure it by means of a microelectrode which has been frequently used in the biological field. The obtained results suggest the presence of the sheet structure. The obtained concentration profile, however, shows that the sheet structure exists mainly in the upper half of the gap although we have been expected that the sheet structure is present in the middle of the gap.

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Date submitted: 05 Aug 2009 Electronic form version 1.4