Abstract Submitted
for the DFD11 Meeting of
The American Physical Society

An effect of zigzag and surface motions of a CO2 bubble on the mass transfer from the bubble to the surrounding liquid MASAHIKO TORIU, Graduate School of Engineering, Shizuoka University, TAKAYUKI SAITO, Graduate School of Science and Technology, Shizuoka University — A bubbly flow is very useful for aeration, agitation and an enhancement of chemical reaction, etc. in industrial processes. In order to improve the efficiency of the industrial plants, we should acquire the knowledge of a bubbly flow: e.g. bubble motion, mass transfer and surrounding liquid motion. Using a single CO2 bubble well-controlled in its zigzag motion and surface oscillation, we discuss a relation between the bubble motions and the mass transfer. For this particular purpose, we precisely measured the bubble volume and the surface area, using two high-speed cameras and mirrors. By image processing, a 3D-bubble shape was reconstructed based on the projected bubble images. We regarded the volume/surface area of 3D-model as the volume/surface area of the examined bubble. In addition, instantaneous mass-transfer coefficients were calculated from these results. The mass transfer of the bubble was enhanced when the bubble trajectory shifted from the linear mode to the zigzag mode.

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Date submitted: 29 Jul 2011 Electronic form version 1.4