

Ambiguous effect of liquid viscosity on bubble bed uniformity

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So far, a detailed experimental study on the effect of Newtonian viscosity on the bubble bed uniformity has not been performed. There are several existing results indicating an adverse, or at most an ambivalent effect of this important constitutive parameter. Therefore, we tried to resolve this problem in a laboratory bubble column. It was found that although the viscosity generally tends to destroy the uniformity by inducing bubble coalescence, hence polydispersity in sizes and velocities, it can also support the uniformity by damping the velocity fluctuations. These experimental results are linked to the recent stability theory that predicts a clearly stabilizing effect.

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