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Trajectories of air bubbles rising in dense suspensions in a Hele-Shaw cell RAMON SANCHEZ, RAMON HERRERA, CESAR ROMO, Electrical Research Institute, EDUARDO RAMOS, Center for Energy Research UNAM —
The motion of bubbles rising in a glass bead-water suspension is investigated experimentally. Observations have been conducted in a suspension confined between two vertical glass plates separated 3 mm. We report experimental results of the velocity and the path of air bubbles rising with various equivalent diameters in the range 1 to 4 mm and generation frequencies in the range 1 to 10 bubbles/s. The glass spheres in the suspension have diameters in the range 5 μm to 100μm and are hollowed with an effective density of 1.05 g/cm^3. Suspension concentrations used are up to 55% by weight. Observations indicate that bubble trajectories for concentrations of 30% and higher are composed by the general ascending trend plus rapid zigzagging displacements superimposed to a relative slow horizontal oscillation. This dynamics contrasts with the almost rectilinear paths of bubbles of the same diameter rising in pure water. We have also observed that for low concentrations, the bubble rising velocity depends on the departing frequency at the bottom of the cell.

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