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Coarsening in steady-state aqueous foam[1] KLEBERT FEITOSA, DOUGLAS J. DURIAN, University of Pennsylvania — We perform an experiment with a column of aqueous foam maintained in steady-state by a constant gas flow rate at the bottom. In steady-state we measure the bubble velocity u, bubble radius R_{32} and liquid fraction ε in the foam as a function of height. Away from the bottom, capillary effects are negligible and the liquid fraction profile, set by the balance of viscous forces and gravity, does not change with time. Taking the liquid fraction as a given, the gas transport is investigated. We find that the bubbles rise with constant speed equals to the measured gas flux and coarsen as a function of height. We measure the coarsening rate for almost three decades in liquid fraction combining data from steady-state and free drainage experiments. The results show that the coarsening rate grows without bound proportional to $1/\sqrt{\varepsilon}$ for the entire range of liquid fractions.

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