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Gas depletion through single gas bubble diffusive growth and its effect on subsequent bubbles[1] ALVARO MORENO SOTO, Physics of Fluids Group, University of Twente, ANDREA PROSPERETTI, Department of Mechanical Engineering, John Hopkins University, DETLEF LOHSE, DEVARAJ VAN DER MEER, Physics of Fluids Group, University of Twente, PHYSICS OF FLUID GROUP COLLABORATION, MCEC NETHERLANDS CENTER FOR MULTISCALE CATALYTIC ENERGY CONVERSION COLLABORATION — In weakly supersaturated mixtures, bubbles are known to grow quasi-statically as diffusion-driven mass transfer governs the process. In the final stage of the evolution, before detachment, there is an enhancement of mass transfer, which changes from diffusion to natural convection [O.R. Enríquez et al., The quasi-static growth of CO2 bubbles, *Journal of Fluid Mechanics* **741**, R1 (2014)]. Once the bubble detaches, it leaves behind a gas-depleted area. The diffusive mass transfer towards that region cannot compensate for the amount of gas which is taken away by the bubble. Consequently, the consecutive bubble will grow in an environment which contains less gas than for the previous one. This reduces the local supersaturation of the mixture around the nucleation site, leading to a reduced bubble growth rate. We present quantitative experimental data on this effect and the theoretical model for depletion during the bubble growth rate.

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