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Collective dissolution of microscopic bubbles[1] SEBASTIEN MICHELIN, LadHyX - Ecole Polytechnique, ERIC LAUGA, DAMTP - University of Cambridge — The dissolution of a single microscopic gas bubble in the surrounding liquid environment is a classical problem: the capillary pressure inside the bubble and the chemical equilibrium of the two phases (Henry's law) drive the diffusion of the excess dissolved gas away from the bubble, leading to its collapse and dissolution in finite time. This diffusion process conditions the lifetime of the bubble and is sensitive, among other effects, to the chemical and mechanical environment of the bubble. In this work, we investigate specifically the influence of other diffusing bubbles on the dissolution process and characterize these collective dynamics: each bubble acts as a chemical source and therefore slows down the dissolution of its neighbours. The effect of bubble density and spatial arrangement on their collective dissolution and life time will be discussed.

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