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COARSENING OF AQUEOUS FOAMS. MICROGRAVITY EXPERIMENTS

Abstract

We will present studies of foams, dispersions of gas bubbles in water, stabilized by surfactants. The foams evolve with time due to three different processes: liquid drainage produced by gravity, bubble growth due to gas transfer and bubble coalescence. On Earth, only foams containing very small amounts of liquid can be studied. We will show that the gas transfer depends on the surfactant, essentially because of differences in permeability of the films separating gas bubbles[1]. We will show how this permeability can be measured using two-dimensional foams [2]. Bubble coalescence may enhance the bubble's growth rate. Two calescence mechanisms will be discussed, one associated to bubble reorganisation in the foam [3] and one to small particles added in water (antifoam agents). In the second case, recent parabolic flights helped to clarify the mechanism [4]. We will discuss the potential changes expected in wetter foams, such as those that will be studied in the International Space Station (project Soft Matter dynamics to be launched in 2018). A description of the space experiment will be presented

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