

Abstract Submitted
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A numerical study of the life time of superficial bubbles in water-alcohol mixtures with surfactants¹ OMER ATASI, Institut de Mecanique des Fluides de Toulouse (IMFT), Universite de Toulouse, CNRS, INPT, UPS, Toulouse, France, BENOIT SCHEID, BENOT HAUT, Universite Libre de Bruxelles - Transferts Interfaces et Procèdes (TIPs), DOMINIQUE LEGENDRE, Institut de Mecanique des Fluides de Toulouse (IMFT), Universite de Toulouse, CNRS, INPT, UPS, Toulouse, France, ROBERTO ZENIT, Universidad Nacional Autonoma de Mexico - Instituto de Investigaciones en Materiales — The evaluation of the lifetime of bubbles at the surface of a liquid has been used as an empirical technique in the traditional production of Mezcal (an artisanal distilled agave spirit from Mexico) to determine the desired concentration of alcohol. We investigated this problem in light of computational fluid dynamics (CFD) using a level-set method and a scalar transport technique to account for the presence of surfactants. We determined the rupture time of the film at the top of a bubble in function of the various bulk and surface properties. In agreement with experiments, we found that the superficial bubbles exhibit an extended lifetime for an intermediate water-alcohol concentration, corresponding to both a maximum of viscosity and a specific concentration of surfactants. We finally propose a scaling law that should be of practical use for Mezcal production.

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