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# A review of aqueous foam in microscale

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## Abstract

In recent years, significant progress has been achieved in the study of aqueous foams. Having said this, a better understanding of foam physics requires a deeper and profound study of foam elements. This paper reviews the studies in the microscale of aqueous foams. The elements of aqueous foams are interior Plateau borders, exterior Plateau borders, nodes, and films. Furthermore, these elements' contribution to the drainage of foam and hydraulic resistance are studied. The Marangoni phenomena that can happen in aqueous foams are listed as Marangoni recirculation in the transition region, Marangoni-driven flow from Plateau border towards the film in the foam fractionation process, and Marangoni flow caused by exposure of foam containing photosurfactants under UV. Then, the flow analysis of combined elements of foam such as PB-film along with Marangoni flow and PB-node are studied. Next, we contrast the behavior of foams in different conditions. These various conditions can be perturbation in the foam structure caused by injected water droplets or waves or using a non-Newtonian fluid to make the foam. Further review is about the effect of oil droplets and particles on the characteristics of foam such as drainage, stability and interfacial mobility.

*Keywords:* Foam, PB, Interior node, Exterior node, Hydraulic resistance, Bubble, Marangoni flow, Oil droplet, Particles in foam

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## 1. Introduction

Aqueous foam is a dispersion of a high volume fraction of gas bubbles in a small volume of liquid with some additives [1]. Foam existence could

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