



VII Encuentro Argentino de Materia Blanda

Foam and emulsion stability and its relation with surface rheology

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Despite its practical importance, foam and emulsion stability is not yet fully understood. This stability can be frequently related to the surface compression elasticity that characterizes surface tension gradients (Marangoni forces).

We will first discuss the case of unstable foams and emulsions, where coalescence of approaching bubbles or drops readily occurs once the films formed between them are thin enough. This behavior is generally observed when the amount of surface active stabilizers (surfactant or other species) is small. It is also observed in emulsions containing larger amounts of surfactant made with microemulsions coexisting with both oil and water: these systems form very unstable emulsions when shaken. Film thinning is related to the surface compression elasticity, which is affected by the solubilization of surfactant in water (or oil). This behaviour allows explaining the observations.

We will also discuss the case where stable films form between bubbles and droplets, and where coalescence proceeds via different mechanisms. Some of these mechanisms also involve the compression elasticity of the surface layers.

Foam and emulsions with solid surface layers are generally very stable. In this case, the surface shear rheology might play a role, but this role is less clear.