

Observations of Air Bubbles, Giant Pickering Droplets, Colloidosomes and Liquid Marbles Stabilised by Polymer Latexes

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Particle-stabilised interfaces offer certain advantages over surfactant-stabilised systems including greater stability and ease of recovery of the particles (if required). Bulk “jar-test” observations of particle stabilised foams and Pickering emulsions yield important information regarding the foam or emulsion volume fraction, lifetime and thus stability. However, observations of individual bubble or droplet pairs can provide additional valuable information on thin film drainage times, coalescence mechanisms and avenues to improve multiphase formulation stability. This is especially so when complemented by particle adsorption kinetics accessed via for example dynamic surface tension measurements.

We have been investigating the stability and coalescence of a range of polymer colloid stabilised fluid interfaces using a combination of coalescence rig¹ and high speed video camera. This rig permits high temporal resolution measurements of coalescence time (thin film drainage time) and the direct visualisation of bubble or droplet coalescence dynamics which is facilitating our understanding of stability in these multiphase systems.

Examples to be discussed include a pH-responsive microgel particle stabilised foam,² Pickering emulsions and cross-linked latex stabilised colloidosomes,³⁻⁵ and pH-responsive latex stabilised liquid marbles.⁶

References

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