

Droplet Explosions: The Effect of Electrolytes on Emulsion Stability and Solubilization

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My project involved looking at the stability of an oil in water emulsion with surfactant. Experiments to determine the time of complete solubilization for emulsions without an electrolyte (control) and with 0.10 M of an electrolyte were performed. Learning how to tailor emulsion stability could have potential impacts on the food, cosmetic and pharmaceutical industries. Analysis of the experiments performed showed that time for complete solubilization increased with increasing droplet size. Observations showed when an electrolyte is added



to the emulsion there is a distinct appearance of a third phase “halo”. The projections become more prominent and complete solubilization is slower.

The experiments performed were the foundation for future studies to explain how electrolytes play a role in complete solubilization. Understanding how electrolytes affect the stability provides information to further tune the emulsions for potential use in industry. This summer project taught me new skills, from digital notebooks (as well as my old school paper notebook) to new software to analyze my droplets and convert videos to user friendly versions. I read many research papers trying to find answers to questions about my project. Six weeks is not a lot of time to “solve a problem” and I usually ended up with more questions than answers after each experiment. I realized with this experience that I am a scientist that teaches. I look forward to sharing my experience with students and faculty.