

Abstract Submitted  
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**Effects of Marangoni Stresses on Drop Coalescence** SOFYA KABACHEK, H. PIROUZ KAVEHPOUR, UCLA — In many applications involving drop-drop interactions, such as alcohol-based fuel cells and many microfluid devices, miscible fluids are not necessarily of the same kind. To better understand these phenomena, further insight into coalescence of different fluids is essential. When miscible drops of different liquids come in contact, coalescence often occurs and a surface tension difference may arise at the interface. This difference plays an important role in the process due to the Marangoni effect. To quantify the extent of this effect we conducted a parametric study on the effects of surface tension variation on drop coalescence (partial and full); in particular coalescence time and drop diameter ratios were investigated. A high speed digital camera with high resolution was utilized to study the evolution of drops during the coalescence process. We showed that coalescing drops with higher surface tension than the reservoir fluid, behave similarly to drops coalescing in a viscous environment. A new physical model was developed in good agreement with the experimental data.

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