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An experimental study of liquid drop - interface coalescence in the presence of surfactants PANAGIOTA ANGELI, MAXIME CHINAUD, Department of Chemical Engineering, University College London, Torrington Place, London WC1E 7JE, UK, KAI LI, WEI WANG, Beijing Key Laboratory of Urban Oil and Gas Distribution Technology, China University of Petroleum, Beijing, PR China, UNIVERSITY COLLEGE LONDON TEAM, BEIJING KEY LABORATORY OF URBAN OIL AND GAS DISTRIBUTION TECHNOLOGY TEAM — Drop-interface coalescence has been the subject of many studies both theoretical and experimental. It is of particular interest for the oil industries particularly during the transportation of multiphase mixtures where coalescence rates can affect the stability and separation of dispersions. It is well-known that the presence of surfactants can significantly affect the coalescence rates. In this work a silicon oil -water system has been studied in a rectangular coalescence cell. Both rising oil drops and falling water drops coalescing with the water-oil interface have been investigated. A water soluble surfactant, SPAN 80, was used. High speed imaging has been performed to study the coalescence phenomenon and obtain the coalescence time of the drops with the interface with and without the presence of the surfactant. The velocity fields in the bulk fluid and in the liquid film forming between the drop and the interface were studied with shadowgraphy (bright field Particle Image Velocimetry). To increase the spatial resolution particularly in the liquid film microscope lenses were implemented. Results have been compared against existing literature.

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