

Abstract Submitted
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block copolymer stabilized emulsion drops¹ DAMITH ROZAIRO, ANDREW B. CROLL, North Dakota State Univ — Emulsion droplets play an important role in countless industrial systems, polymer synthesis and even advanced schemes for drug delivery. Many researchers have adopted block copolymer surfactants for the added functionality that polymer chemists can create. Currently, much understanding of block copolymer coated emulsion droplets has been inferred from the behaviour of small molecule surfactants, however, this may be misleading. In this work we study the approach of a polystyrene-poly (ethylene oxide) coated oil drop to a smooth flat surface using confocal microscopy. We find a slow drainage dynamic that is unique to the long block copolymer molecules. We use a simple scaling model to highlight the importance of three length scales in the problem: the hydrodynamic slip length, the brush height, and the width of a rim formed as the drop buckles during approach to the flat surface. Understanding this approach process is critical to understanding surface wetting, coalescence and other basic emulsion phenomena.

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Andrew Croll
North Dakota State Univ

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