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Superspreading: molecular dynamics simulations and experimental results[1] PANAGIOTIS THEODORAKIS, Imperial College London, NINA KOVALCHUK, VICTOR STAROV, Loughborough University, ERICH MULLER, RICHARD CRASTER, OMAR MATAR, Imperial College London — The intriguing ability of certain surfactant molecules to drive the superspreading of liquids to complete wetting on hydrophobic substrates is central to numerous applications that range from coating flow technology to enhanced oil recovery. Recently, we have observed that for superspreading to occur, two key conditions must be simultaneously satisfied: the adsorption of surfactants from the liquidvapor surface onto the threephase contact line augmented by local bilayer formation. Crucially, this must be coordinated with the rapid replenishment of liquidvapor and solidliquid interfaces with surfactants from the interior of the droplet. Here, we present the structural characteristics and kinetics of the droplet spreading during the different stages of this process, and we compare our results with experimental data for trisiloxane and poly oxy ethylene surfactants. In this way, we highlight and explore the differences between surfactants, paving the way for the design of molecular architectures tailored specifically for applications that rely on the control of wetting.

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