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Fragmentation and wetting of spherical micelles in confined flow

MONA HABIBI, Department of Applied Mathematics, University of Western Ontario, COLIN DENNISTON, University of Western Ontario, MIKKO KARTTUNEN, University of Western Ontario, University of Waterloo — We use coarse-grained molecular-dynamics (MD) simulations to study the structural and dynamical properties of surfactant micelles under Poiseuille-like flow in a nano-confined geometry. The effect of flow, confinement, and wetting on spherical micelles of sodium dodecyl sulfate (SDS) is explored when the micelle is forced through a channel slightly smaller than its equilibrium size. Inside the channel, the micelle may fragment into smaller micelles. We demonstrate that in addition to the flow rate, the wettability of the channel surface dictates whether the micelle fragments and determines the size of daughter micelles.

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