

Abstract Submitted
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Using Dissipative Particle Dynamics to Investigate the Behaviour of Surfactant Solutions Under Shear Flow¹ RACHEL HENDRIKSE, ANDREW BAYLY, PETER JIMACK, XIAOJUN LAI, University of Leeds — Surfactants are present in many everyday products, including detergents and shampoos. Amphiphilic surfactant molecules will self-assemble into lyotropic liquid crystal structures when in solution. The different structures that form alter the rheology of the solution. There exist a wide range of possible solution phases, each possessing different properties e.g. viscosity. Small scale modelling of the clustering behaviour of surfactant molecules in solution helps us to understand the effects of the small scale on the rheology of the material. Multiple simulation methods are possible for this type of investigation, but this poster will focus on the use of Dissipative Particle Dynamics (DPD). DPD is an off-lattice, mesoscopic simulation technique which involves a set of particles moving in continuous space. DPD has benefits over Molecular Dynamics (MD) techniques, and has the potential for reaching longer length and time scales. Most existing research focuses on understanding equilibrium behaviour, however the complex behaviour of surfactant solutions under shear flow is not well understood. This poster will present the different methods that can be used to calculate the shear viscosity of a fluid. The viscosities calculated can be compared with those found experimentally.

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