Abstract Submitted
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**Light-Induced Gelling in a Micellar Fluid Based on a Zwitterionic Surfactant.**[1] RAKESH KUMAR, SRINIVASA RAGHAVAN, University of Maryland — Fluids with photoresponsive rheological properties (i.e. photorheological or PR fluids) can be useful in a range of applications, such as in dampers, sensors, and valves for microfluidic or MEMS devices. Previously, we have demonstrated a cationic surfactant-based PR fluid whose viscosity can be rapidly decreased by UV irradiation. This viscosity decrease was not reversible. Here, we describe a different formulation based on a zwitterionic surfactant that shows a rapid increase in viscosity (gelling) upon exposure to UV radiation. The formulation consists of the zwitterionic surfactant and a photosensitive cinnamic acid derivative. Initially, the viscosity of the fluid is low indicating the presence of small micelles. Upon UV irradiation, the cinnamic acid derivative is photoisomerized from trans to cis. In turn, the small micelles transform into long wormlike micelles, thus increasing the solution viscosity by more than five orders of magnitude. Small angle neutron scattering (SANS) data confirms the dramatic increase in micelle length. Possible reasons for such changes in micelle dimensions will be discussed.

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Rakesh Kumar
University of Maryland

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