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Thermoreversible Vesicle-to-Micelle Transitions in Surfactant-Salt Mixtures AIMEE KETNER, TANNER DAVIES, SRINIVASA RAGHAVAN, Department of Chemical and Biomolecular Engineering, University of Maryland, College Park, MD 20742 — Mixtures of the cationic surfactant, CTAB and the organic compound, 5-methyl salicylic acid (5mS) spontaneously self-assemble into unilamellar vesicles at room temperature. Upon heating, these vesicles undergo a thermoreversible transition to wormlike micelles. This phase transition results in a 1000-fold increase in the solution viscosity with increasing temperature. Small-angle neutron scattering (SANS) measurements show that the phase transition from vesicles to micelles is a continuous one, with the vesicles and micelles co-existing over a range of temperatures. A mechanism for the above phase transition is proposed, based on the desorption of bound aromatic counterions from the vesicle as a function of temperature.

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