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Shape and Size of highly concentrated micelles in CTAB/NaSal solutions by small angle neutron scattering (SANS) HU CAO, HELMUT KAISER, NARAYAN DAS, PAUL SOKOL, Center for the Exploration of Energy and Matter, Indiana University, Bloomington, IN 47408, JOSEPH GLADDEN, Dept. of Physics and Astronomy, University of Mississippi, University, MS 38677 — Highly concentrated micelles CTAB/NaSal with a fixed salt/surfactant ratio of 0.6 have been studied by small angle neutron scattering (SANS) as a function of temperature and concentrations. A modeling analysis with a combination of ellipsoid, Gaussian size distribution and Hard Sphere Model (HSM) on SANS data suggests that these micelle solutions have an ellipsoidal structure, which is independent on the concentrations and temperature. However, the micelle size decreases monotonically as increasing the temperature or concentration. Besides, it was found that the number density of particles increases as increasing the temperature, while the total volume keeps unchanged. These observations indicate that large micelles at low temperature begin to break to form small ones as increasing the temperature and these broken surfactant molecules aggregate again under the effect of strongly binding counterions to form more micelles.

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