

Abstract Submitted  
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**Investigating the structures and phase behavior of anionic perfluorinated surfactant using SANS** GARFIELD WARREN, DOBRIN BOSSEV, Indiana University — We have examined the structures formed by mixtures of tetraethylammonium perfluorooctylsulfonate (TEAFOS) and lithium perfluorooctylsulfonate (LiFOS) in water using small angle neutron scattering (SANS). SANS is an ideal method to characterize the morphology of such soft materials because the wavelength of the cold neutrons is comparable to the characteristic length scale of the surfactant structures and the possibility to apply the contrast variation technique. Results were obtained for mixtures at a constant surfactant concentration of 100 mM and different TEA/Li ratios at a temperature of 30 ° C. SANS curves were obtained either from the fluorinated micellar core or from the hydrogenated counterion atmosphere surrounding the micelles applying contrast matching. A transitional change in shape from spherical to prolate micelles was observed for TEA fractions greater than 30 mM. For TEA fractions greater than 55mM, threadlike micelle structures are present. From the SANS data we are able to correlate the counterion binding of the two different species to the shape and size of the micellar structure and confirm the role that the counterion environment plays in macroscopic rheological properties.

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