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Predicting the Solution Morphology of a Sulfonated Pentablock Copolymer in an Arbitrary Solvent Mixture JAMIE FORD, WILLIAM KYEI-MANU, KAREN WINEY, University of Pennsylvania — Block copolymers self assemble into a wide array of morphologies in solvents. To predict the solution morphology of the polymer, we assess the interactions between the individual blocks and the solvent or solvents. Here, we use the Hansen solubility parameters to calculate the interactions between a library of solvents and an ABCBA pentablock copolymer with non-polar A and B blocks and a polar, sulfonated C block to predict the expected morphology for a given solvent and compare it to our small-angle X-ray scattering data. In non-polar solvents, we observe micelles with a C core and an A-B corona. We observe inverted micelles in polar solvents – an A-B core with a C corona. We extended our methodology to mixed polar/non-polar solvent systems to predict the solvent ratios corresponding to the transition from micelles to inverted micelles.

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