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Investigation of the Melting Point Depression of 12-Hydroxystearic Acid Organogels Using the Flory Diluent Model KEVIN CAVICCHI, BRIAN LIPOWSKI, University of Akron — This talk will focus on the gelation behavior of 12-hydroxystearic acid (12-HSA) in organic solvents. Thermo-reversible gelation occurs by crystallization of 12-HSA in organic solvent to form 3-D fibrillar networks. The melting point vs. composition for 12-HSA in a range of solvents has been measured. The liquidus lines could be fit with the Flory-diluent model that takes into account the non-ideal free energy of mixing and the disparity in the size of the solvent and 12-HSA molecules. The fits indicated that the effective molar volume of 12-HSA increased as the hydrogen bonding Hansen solubility parameter δ_h of the solvent decreased. This is attributed to the hydrogen-bonding driven aggregation of the 12-HSA in the liquid state based on previous observations that 12-HSA forms aggregated structures in non-polar solvents (e.g. dimers and tetrameters). These results indicate that the stabilization of the solid phase in 12-HSA solutions has contributions from both variations in the entropy of mixing as well the enthalpy of mixing. The importance of both these factors for designing small molecule gelators will be discussed.

Kevin Cavicchi
The University of Akron

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