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Gelation of anisotropic silica colloids with thermoreversible short-range interactions RYAN MURPHY, NORMAN WAGNER, University of Delaware — Colloidal suspensions containing anisotropic particles are widely used in particle-based technologies including pharmaceuticals, consumer products, and coatings. The rheological properties of colloidal suspensions are known to be affected by particle shape; however, the combined influence of particle shape and attraction strength is not quantitatively understood for dynamic arrest transitions such as gelation. A model system of anisotropic silica colloids with thermoreversible, short-range attractions was developed to quantify the effect of particle shape and attractions on the gelation behavior. This tunable model system aims to map a fundamental state diagram for anisotropic particle suspensions as a function of particle shape, volume fraction, and interaction strength. Macroscopic rheological properties of thermoreversible gels were explored to determine the influence of particle shape on the gel transition. Neutron and x-ray scattering methods further probed the underlying fluid and gel microstructure at various temperatures, volume fractions, and aspect ratios. Linking these fundamental macroscopic and microscopic measurements will provide practical insight into particle technologies and manufacturing processes containing anisotropic colloidal suspensions.

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