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Phase behavior of platelets at different aspect ratios ANDRES MEJIA, YA-WEN CHANG, Artie McFerrin Department of Chemical Engineering, Texas A&M University, College Station, TX 77843, DAZHI SUN, Department of Mechanical Engineering, Texas A&M University, College Station, TX 77843, AGUSTIN DIAZ, ABRAHAM CLEARFIELD, Department of Chemistry, Texas A&M University, College Station, TX 77843, HUNG-JUE SUN, Department of Mechanical Engineering, Texas A&M University, College Station, TX 77843, ZHENGDONG CHENG, Artie McFerrin Department of Chemical Engineering, Texas A&M University, College Station, TX 77843 — Suspensions of α -ZrP monolayer plates have recently been found to exhibit an isotropic to nematic (I-N) and nematic to smectic (N-S) phase transition. In the past, computer simulations have been developed to study the phase diagrams of platelets. In order to experimentally investigate the phase transitions and rheological behaviors of these particles, it is necessary to be able to manipulate their size, thickness and reduce their size distribution. We demonstrate here the strong dependency of the I-N transition on the aspect ratio (diameter/thickness) via the control of pristine α -ZrP platelets. We confirmed that the I-N transition volume fraction decrease monotonically with the aspect ratio as shown in previous simulations by J.A.C. Veerman and D. Frenkel. Furthermore, we found additional isotropic and gel phases by increasing the polydispersity of platelet sizes.

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