

Abstract Submitted
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Liquid Crystals of Disks of Controlled Aspect Ratios¹ ZHENG-DONG CHENG, MIN SHUAI, ANDRES F. MEJIA, Artie McFerrin Department of Chemical Engineering — Nanoparticles with quasi two-dimensional shapes serve as building blocks for discotic colloidal liquid crystals. However, due to difficulty of synthesis and especially shape-tuning of disk-shaped nanoparticles, good model systems for the study of discotic colloidal liquid crystals are hard to found. α -zirconium phosphate (ZrP) crystals synthesized through hydrothermal treatment has regular disk shapes and controllable size, thickness, as well as size polydispersity. We experimentally illustrate that aqueous suspensions of these ZrP disks form stable liquid crystal phase easily. By choosing the thickness of the disks, an iridescent liquid crystal phase has been achieved. The critical concentration of the phase transition was found to be dependent on aspect ratios. We will also discuss our recent results on the phase diagram of discotic liquid crystals as a function of aspect ratio and particle concentration using ZrP monolayers and wax disks.

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