

Abstract Submitted
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Direct observation of lens-shaped nematic tactoids and micro-phase separation in aqueous suspensions of α -zirconium phosphate nanosheets¹ YUE SHI, MIN SHUAI, YONGQIANG SHEN, DONG CHEN, JOSEPH MACLENNAN, Department of Physics, Liquid Crystal Materials Research Center, University of Colorado, Boulder, CO 80309, USA, ZHENG DONG CHENG, McFerrin Department of Chemical Engineering, Texas A&M University, College Station, TX 77843, USA, NOEL CLARK, Department of Physics, Liquid Crystal Materials Research Center, University of Colorado, Boulder, CO 80309, USA — We study the ordering of monolayer α -zirconium phosphate nanosheets in aqueous suspensions. As the concentration increases, we confirm that the inter-plate spacing decreases, the X-ray correlation increases, and there is nematic ordering even at the highest concentrations. The inter-plate spacing shows linear swelling behavior, but not as expected for a uniform swelled system. The micro-phase separation is proposed and further demonstrated by centrifugation, optical microscope, confocal fluorescent microscope and freeze fracture TEM. Self-assembling of stacks of the platelets are proposed to form liquid crystal phases. Lens-shaped tactoids with radial director field are observed, and the quantitative analysis of the tactoid properties gives estimates of ratios of the bulk elastic constant, anchoring strength to the bare surface tension.

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