

Unidirectional Colloidal Arrangement under Centrifugal Force Field toward Large-area Defect-free Colloidal Crystals

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Colloidal crystals have various potential applications as photonic crystals, SPR and SERS active substrates. Crystallization process of colloidal crystals were based on the self-assembly approach and they have many advantages related to economical aspects and simple processes. However, conventional self-assembly method also has many disadvantages such as, large-area fabrication, defect control and long processing time. P. Jiang and his colleagues suggested spin-coating method to achieve 4 inch wafer-size preparation of colloidal crystals with extremely small number of defects. Those colloidal crystals show vivid diffracted lights called six-armed star and the author insisted that the six-armed star is the strong evidence of uniform colloidal crystal array over the whole samples. In this report, we are going to explain the origin of six-armed star and new approach to achieve starless unidirectional colloidal crystal arrays.