

Silica Colloidal Crystal Films over Large Area

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Colloidal crystals of microspheres are of considerable technological and scientific importance in optical devices, high-density data storages, biosensors and emerging applications. We prepared viscous colloidal suspension of 800-nm silica particles in polymerizable liquid of 3-Trimethylolpropane epoxy triacrylate (TMPEOTA) or 3-Trimethylolpropane triacrylate (TMPPTA). By spin-coating our viscous suspension on substrate, we prepared colloidal crystal films over large area, in which the thickness or the number of layers were controlled precisely by changing spinning rate or particle concentrations. Then, their crystalline structures were captured by the UV curing or rapid thermal annealing (RTA) at 500°C. Their microstructures over large area were measured and analyzed and their optical properties were also investigated.