Effect of post thermal treatment on self-assembly of colloidal polymer particles for 3D well-ordered films

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Recently, three-dimensional particles arrays have been interested in numerous fields such as photonic crystals, chemical sensors and solar cells. Although self-assembly methods such as vertical deposition, spin-coating, Langmuir-Blogett (LB) technique have been studied to create highly-ordered colloidal arrays, there are some problems of requirement of a long manufacturing time, irregular surface of deposited films and unstable films consisting of colloidal particle arrays.
In this study, 3D well-ordered colloidal pattern films were developed by spin coating of polystyrene/polydimethylsiloxane (PS/PDMS) particles with post thermal treatment. With simultaneously adjusting colloidal solution concentration and drying temperature, thickness of hexagonal patterned films was successfully optimized with well ordering.
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