Patterning of Polymeric Multilayer Films

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Since the ionic layer-by-layer assembly technique was first introduced for the fabrication of polyelectrolyte multilayers, this self-assembling technique has been extended to conducting polymer composites, nonlinear optical dyes, and the assembly of biomolecular systems. A promising aspect of these ultrathin films is the development of built-up micropatterns. In this report, for the creation of the ultrathin multilayer films with well-defined micropatterns, the various methods such as microcontact printing, microfluidic channel, and photolithography was investigated. These methods utilize different intermolecular interactions (electrostatic interaction and hydrogen bonding) and applied to sub-micrometer patterning. In the light of the wide application range of the ultrathin multilayer films, the various patterning method in the present study opens up new possibilities for highly efficient electronic/photonic devices based on multilayer structures.