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Functionalization of PEO Nanocylinder Array Structure in Block Copolymer Thin Film. KAORI KAMATA, JST-PRESTO, TOMOKAZU IYODA, Tokyo Institute of Technology — Phase-separated nanostructure of block copolymer has been intensively studied as one of the most promising candidates for many important nanotechnological applications, because the feature size of domain structure generated by block copolymers is ranging to a level of several nanometers. We have studied the nanostructures of block copolymers, which are based on the use of amphiphilic block copolymer, PEO-b-PMA(Az), to establish the long range orderness onto the substrate. Here, we describe the nanotemplating process with domain selective doping of PEO cylindrical domains, using various kinds of metal cation sources, such as Fe or Pb ions. Furthermore, the ionic liquid also hybridized into the PEO nanocylinders to form liquid nanochannels perpendicular to the substrate. A wide variety of cations were successfully incorporated through the coordination bonding with the oxygen in PEO chain. The resulting metal cation hybrid films could offer the metallic nanopillar arrays, with the nanostructure-specific electrochemical, electric or magnetic properties.

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