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**Nanoporous thin films from nanophase-separated hybrids of block copolymer/metal salt** YOSHIO SAGESHIMA, ATSUSHI NORO, YUSHU MATSUSHITA, Nagoya University — Block copolymers self-assemble into periodic nanostructures, i.e. nanophase-separated structures, which can be scaffolds for nanoapplications such as nanoporous membranes, nanolithographic masks, photonic crystals, etc. In this study, we report facile preparation to achieve nanoporous thin films from nanophase-separated hybrids comprising polystyrene-*b*-poly(4-vinylpyridine) (PS-P4VP, $M_{\mathrm{n}}$ =54k, PDI=1.13, $f_{\mathrm{s}}$ =0.61) and water-soluble iron(III) chloride ($FeCl_3$), where $FeCl_3$ are incorporated into a P4VP phase via metal-to-ligand coordination. To obtain a nanoporous film, firstly a hybrid thin film was prepared by microtoming. Then, the film was immersed into water to remove metal salts, this simple procedure can produce nanoporous thin film. Morphological observations were conducted by using transmission electron microscopy (TEM). Ordered cylindrical nanopores were observed in the thin film of the water-immersed hybrid, which originally presents cylindrical nanodomains. The nanoporous film was modified by loading another metal salt, samarium(III) nitrate, into nanopores via coordination between the metal salt and P4VP tethered to the pore walls. The structure of the sample after modification was evaluated by TEM and an energy dispersive X-ray spectroscopy.

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