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Hierarchically Ordered Block Copolymer Micelles Formed by Controlled Evaporative Self-Assembly WEI HAN, MYUNGHWAN BYUN, ZHIQUN LIN, Iowa State University — Highly ordered gradient stripes of PS-b-P4VP block copolymer were obtained by combining the microscopic controlled evaporative self-assembly (CESA) of confined microfluid of PS-b-P4VP toluene solution in a "cylinder-on-Si" geometry with spontaneous self-assembly of micellar hexagonal arrays of PS-b-P4VP at the nanometer scale. The order of packed micelles within microstripes could be significantly improved by subsequent THF vapor annealing. The surface reconstruction of micelles led to the formation of nanoporous arrays when immersed in a selective solvent of the pore component. Gold nanoparticles were then selectively deposited into the core of micelles, and eventually forming the hexagonal arrays of gold nanoparticles after removal of polymer templates by oxygen plasma. The formation of gold particle arrays was verified by XPS measurement.

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