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Self-assembly of ordered mesoporous platinum from nanoparticle-block copolymer mixtures SCOTT WARREN, FRANK DISALVO, ULRICH WIESNER, Cornell University, CORNELL FUEL CELL INSTITUTE COLLABORATION — Discovery of novel catalyst architectures with enhanced stability and high platinum utilization is essential to progress in fuel cell materials. I present results from the first synthesis and characterization of an ordered, mesoporous metal produced from co-assembly of metal nanoparticles with block copolymers. This process leads to an ordered, inverse hexagonal hybrid mesostructure; pyrolysis converts this to an ordered mesoporous platinum-carbon nanocomposite. Removal of the carbon yields hexagonally ordered, mesoporous platinum. These materials exhibit the highest electrical conductivity yet measured for ordered mesoporous materials fabricated from block copolymer self-assembly. The use of these materials as a fuel cell electrocatalyst is demonstrated.

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