

Abstract Submitted  
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**Templated Electrodeposition of Highly Porous Nanostructured Materials**<sup>1</sup> HAN-CHANG YANG, STEPHANIE LIM, JIABIN LIU, QIAN WU, X.M. CHENG, Bryn Mawr College — The fabrication of nanoporous materials has been of great interest for applications such as biosensors, photonic materials and energy storage. Compared to many other methods, the templated electrodeposition method is low cost, fast, and compatible with large-scale production. In this work, we developed a templated electrochemical deposition technique for fabricating highly ordered and highly porous nanostructured materials. The fabrication involves the following steps: self-assembly of monodispersed polystyrene spheres, electrochemical deposition of the desired materials, and sphere removal by a dissolution process. Deposition of Au and Ni layered metallic nanoporous structures were studied using different electrolytes at appropriate potentials. The pore size of the materials was tuned by using different sizes of template polystyrene spheres ranging from 50nm to 1000nm. Scanning electron microscopy images confirmed the highly ordered 3-dimensional hexagonal closed pack (hcp) structures in the samples. The templated electrochemical deposition technique provides a promising alternative approach to preparing highly porous anode materials for battery applications.

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