

Abstract Submitted  
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**Controlled Synthesis of Hollow Carbon Nanostructures by Using ZnO Nanostructures as Templates**<sup>1</sup> YIAN SONG, JINGYUE LIU, Arizona State Univ — A rich variety of morphologies of ZnO nanostructures have been synthesized. Those nanostructures include particles, wires, sheets, belts, flowers, etc. Three dimensional hierarchical ZnO nanoarchitectures have been fabricated as well. It is hypothesized that these ZnO nanostructures can be used as templates to produce derivative nanostructures that may possess unique physicochemical properties. We recently developed a simple method to fabricate hollow carbon nanostructures by using the ZnO nanostructures as templates. By decomposing ethanol or other types of selected molecules onto the surfaces of the ZnO nanostructures, conformal deposition of carbonaceous materials can be obtained. The ZnO template can be removed by a high temperature reduction process, resulting in hollow carbon nanostructures. The morphology as well as the wall thickness of the carbon hollow nanostructures can be manipulated or controlled. Further high temperature annealing can convert the hollow carbon nanostructures to graphitic or graphene-like structures with better electrochemical properties for energy storage applications such as supercapacitors or batteries. Examples of hollow carbon nanofibers and nanosheets will be discussed.

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