

Hierarchically Interconnected Nanorods and Nanosheets Based on Layered MOF for Energy Storage Device

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The metal-organic frameworks (MOFs) are one of the notable templates due to their various functional groups, higher porosity, facile to control the pore size and morphology with diverse organic linkers and metal precursors. As for the pseudocapacitive material, the MOF is commonly used as the template with a further annealing process. In this study, the direct growth of nanorods and nanosheets on the surface of u-hl-MOF *via* MOF-derived approach without further addition of cobalt precursor is demonstrated first. After the annealing process with sulfur powder under Ar flow is complete, only the surface of u-hl-MOF is transformed into cobalt sulfide@carbon (Co_{1-x}S@C), whereas the bulk internal u-hl-MOF retains without undergoing any degradation. A solid-state flexible asymmetric supercapacitor is also fabricated using poly(vinyl alcohol)/KOH, u-hl-MSC, and activated carbon/Super P as the electrolyte, cathode, and anode materials, respectively.