Ni-based multi-metal-doped mesoporous silica nanoflowers for Li-ion battery electrode application

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Hierarchical nanostructures have received a wide attention owing to the distinguished physical and chemical properties of the synthesized materials mainly in future energy storage applications. In this study, Ni-based multi-metal doped silica mesoporous nanoflowers were prepared and characterized as a potential anode material for lithium ion batteries. Ce, Al, Mn, and Co species have been chosen as other additive metals for doping in this mesostructure in order to find the enhanced electrochemical performance of the Ni-based silica. Systematic characterization of the material was performed by using TEM, SEM, WA-XRD and N2 sorption. As a result of the analysis, Ce doped Ni-silica compared to the other samples may be attributed to improved electrical conductivity as well as the hierarchical nanoflower-like structure.