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Improved performance of flower-like ZnAl LDH growing on carbon nanotubes used in zinc–nickel secondary battery

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Abstract: In this work**,** a kind of flower-like ZnAl LDH/CNTs composite is fabricated by in-situ growth method. The as-prepared material is characterized by X-ray diffraction (XRD), fourier transform infrared spectroscopy (FTIR), scanning electron microscope (SEM)，transmission electron microscopy (TEM) and nitrogen adsorption and desorption curves. The results of XRD and FTIR prove that ZnAl LDH growing on carbon nanotubes have been synthesized with the classic hexagonal flaky structure. Morphological analysis also clearly shows that ZnAl LDH grows vertically on the surface of carbon nanotubes and forms a kind of unique flower-like structure. The special structure not only enables CNTs to constitute high conductive network, enhancing the conductivity of the material to suppress its electrochemical polarization, but also provides more active sites for the uniform distribution of zinc species, which can reduce the stacking phenomenon of traditional ZnAl LDH sheets and increase its specific surface area. Moreover, ZnAl

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