Sulfidation of NiCo-Layered Double Hydroxide and its Capacitance performance

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Nickel-cobalt layered double hydroxide (NC-LDH) and Na₂S were used as precursors and sulfur source, synthesizing a series of sulfurized products at different degrees by hydrothermal method. The structure of products was characterized by X-ray diffraction. The morphology of them was characterized by scanning electron microscopy (SEM) and transmission electron microscopy (TEM). The elemental content and valence of the products were characterized by X-ray photoelectron spectroscopy (XPS). Then the cyclic voltammetry (CV) and galvanostatic charge-discharge (GCD) to characterize the electrochemical performance of the products. The results show that when the sulfidation is incomplete, the product is NC-LDH/Co₉S₈ or NiCo₂S₄/Co₉S₈ two kinds of material, while when the sulfidation is completed, the product is only NiCo₂S₄. In addition, specific capacitance increases gradually with the increased degree of sulfidation.

Keywords: NiCo-layered double hydroxide; sulfidation; capacitance performance

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