Short Communication

Structural Modification, Synthesis Mechanism and Properties Analysis of Li$_4$Ti$_5$O$_{12}$ Anode Materials

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Li$_4$Ti$_5$O$_{12}$ microsphere was synthesized by hydrothermal method. The effects of amount of lithium hydroxide, hydrothermal time and sintering temperature on properties of sample were studied. The synthesis mechanism of Li$_4$Ti$_5$O$_{12}$ microsphere was preliminary analyzed. The structural characterization was analyzed by X-ray diffraction, and the morphology was investigated by scanning electron microscopy and transmission electron microscopy. The properties of galvanostatic charge, discharge and cycle stability were also studied. The results indicated that when 2.55 mmol LiOH•H$_2$O reacted with 0.2 g hydrolysate, the sample had pure phase, when the hydrothermal condition was 36 h and 180 °C, the structure of sample particle was intactly spherical. The volume average size of samples were between 400 nm to 600 nm. The charge and discharge voltage plateau of samples were very stable. When the sintering temperature was 700 °C, the first discharge capacity was 148.3 mAh•g$^{-1}$ at 0.1 C. After 10th cycle, the discharge capacity retained at 132.5 mAh•g$^{-1}$.

Keywords: Lithium titanate; hydrothermal condition; electrochemical property; hydrothermal method

FULL TEXT

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