Short Communication

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

Cheng Liu, Ju Rong, Yannan Zhang, Xiaohua Yu^{*}, Jianxiong Liu^{*}, Zhaolin Zhan

Faculty of Materials Science and Engineering, Kunming University of Science and Technology, Kunming, 650093, P.R.China.

^{*}E-mail: xiaohua_y@163.com, ljx5192665@163.com

doi: 10.20964/2017.10.25

Received: 2 June 2017 / Accepted: 2 August 2017 / Published: 12 September 2017

$\text{Li}_4\text{Ti}_5\text{O}_{12}$ 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 $\text{Li}_4\text{Ti}_5\text{O}_{12}$ 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 $\text{LiOH}\cdot\text{H}_2\text{O}$ 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 $\text{mAh}\cdot\text{g}^{-1}$ at 0.1 C. After 10th cycle, the discharge capacity retained at 132.5 $\text{mAh}\cdot\text{g}^{-1}$.

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

[FULL TEXT](#)

© 2017 The Authors. Published by ESG (www.electrochemsci.org). This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution license (<http://creativecommons.org/licenses/by/4.0/>).