

Effect of Thermal Annealing Used in the Hydrothermal Synthesis of Titanium Dioxide on Its Electrochemical Properties As Li-Ion Electrode

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Abstract : Due to their exceptional durability, low-cost, high-power density, and reliability, cathodes based on titanium dioxide, and more specifically spinel LTO ($\text{Li}_4\text{Ti}_5\text{O}_{12}$), present an attractive alternative to conventional lithium cathode materials for multiple applications. The aim of this work is to synthesize and characterize the nanopowders of titanium dioxide (TiO_2) and lithium titanate ($\text{Li}_4\text{Ti}_5\text{O}_{12}$) by the hydrothermal method and to use them as a cathode in a lithium-ion battery. The structural and morphological characterizations of the synthesized powders were performed by XRD, SEM, EDS, and FTIR-ATR. Nevertheless, the study of the electrochemical performances of the elaborated electrode materials was carried out by: cyclic voltametry (CV) and galvanostatic charge/discharge (CDG). The prepared electrode by the powder annealed at 800 °C has a good specific capacity of about 173 mAh/g and a good cyclic stability

Keywords : lithium-ion, battery, LTO, TiO_2 , capacity

Conference Title : ICLBT 2022 : International Conference on Lithium Battery Technology

Conference Location : London, United Kingdom

Conference Dates : August 16-17, 2022