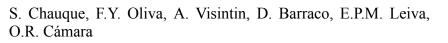
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Lithium titanate as anode material for lithium ion batteries: synthesis, post-

treatment and its electrochemical response

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Abstract

The relationship between the structure and crystallinity of lithium titanate $Li_4Ti_5O_{12}$ at different synthesis post-treatment conditions on the electric energy storage capacity is discussed. $Li_4Ti_5O_{12}$ was synthesized by solid-state reaction at a high temperature and time (950 °C, 24 h) and the resulting material was post-treated with a ball milling process at different times. Additional samples were prepared with a post-calcination after and adding graphite carbon previously to the longer applied ball-milling time. All the obtained materials were structurally and morphologically characterized by XRD and SEM techniques. To study the effect of ball milling time on the lithiumion storage capacity, electrochemical experiments of galvanostatic charge-discharge cycling, cyclic voltammetry, and rate capability experiments were performed. The application of high-energy milling showed that the obtained specific capacity increased with particle size reduction as long as the crystallinity degree of the LTO material remained high. The Li-ion diffusion coefficient for each material was obtained, as well as its specific resistivity and the intrinsic rate constant for the Download English Version:

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