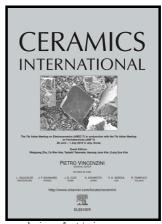
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ACCEPTED MANUSCRIPT

Nitrogen-doped carbon-coated hierarchical Li₄Ti₅O₁₂-TiO₂ hybrid microspheres

as excellent high rate anode of Li-ion battery

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Abstract

Nitrogen-doped carbon-coated Li₄Ti₅O₁₂-TiO₂ (LTO-TO) hybrid microspheres were

prepared by heat treating the dry mixture of urea and chemically lithiated dandelion-like TiO₂

microspheres in a stainless steel autoclave at 550 °C for 5 h. The hybrid materials were tested

as anode of Li-ion batteries. As compared to the pristine sample, the N-doped carbon-coated

LTO-TO microspheres exhibited higher specific capacity at both low and high current rates.

Discharge capacities of 184 and 123 mAh g⁻¹ were obtained at 0.2 C and 20 C, respectively.

Moreover, the LTO-TO/C electrode showed excellent cycle performance, with a discharge

capacity of 121.3 mAh g⁻¹ remained after 300 cycles at 5 C, corresponding to an average

capacity degradation rate of 0.073% per cycle. These high specific capacity, excellent rate

capability and cycle performance demonstrated the high potentiality of the N-doped

carbon-coated LTO-TO microspheres as anode material of both energy storage-type and

power-type Li-ion batteries.

Keywords: Li₄Ti₅O₁₂; Li-ion batteries; Dual phase anode; Carbon coating; Rate capability

1. Introduction

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