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One-step green synthesis of $ZnFe_2O_4$ anodes for Li-ion batteries

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Abstract

The Zinc Ferrite ($ZnFe_2O_4$) spinel nanoparticles have been successfully prepared by green sol–gel synthesis mode employing *Actinidia deliciosa* fruit extract as reducing agent. The target application of the prepared material is anode part in Li ion batteries. The prepared $ZnFe_2O_4$ nanoparticles are subjected to different analyses and the results are promising for this material to serve as anode in Li ion batteries. The structural analysis by means of X-ray diffraction technique reveals pure cubic structure of this material with a crystallite size of 28 nm. The morphological pattern recorded by means of electron microscopes reveal cube shaped grains with mixed dimensions, within 50 nm. The Raman analysis clarifies the high crystalline nature of the prepared sample with sharp peaks. Existence of carbon residues as a result of green reducing agents inside the $ZnFe_2O_4$ matrix are ensured by C—C peaks in FTIR spectra. The same has been verified by means of EDX analysis as well. The electrochemical activities and electrical conductivity values of the material seems to be positive towards the anodic application of $ZnFe_2O_4$ in Li ion batteries.

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Keywords

Spinel; Electrode; Green synthesis; Cyclic voltammetry; Li ion batteries

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Data availability

Data will be made available on request.

Cited by (1)

Green synthesis of ZnFe<inf>2</inf>O<inf>4</inf> nanoparticles using plant extracts and their applications: A review
2023, Science of the Total Environment

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