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Characterization of Complex Spinel LiMn_2O_4 Nanosheet Simulated via Armorphization and Recrystallization Technique

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Abstract content (Max 300 words)
Formatting
Special chars

Particle size reduction (mm to nm) is one of the strategies identified to shorten the electron and lithium ion diffusion paths in cathodes materials for lithium-ion batteries. Its implementation has resulted in enhanced rate capability, improved cycling stability and electrochemical performance of LiMn_2O_4 [1]. The armorphization and recrystallization technique is a practical tool to compliment annealing in experiments. It was previously employed to generate nano-architectures of binaries such as MnO_2 [2] and will be used in the current study on the spinel. Analysis of atomic crystal structures and microstructures of the resulting models, revealed presence of the spinel LiMn_2O_4 polymorph, rutile- MnO_2 and layered- Li_2MnO_3 in the nanosheet LiMn_2O_4 . The highly defected structures revealed vacancies and comprise substitutions of Li and Mn in different layers, which suggest possible mechanisms for Li mobility. The calculated XRD compare favourably with measured XRD providing valuable insights of the atomistic models and supporting observations in microstructural features.

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yes

Level for award (Hons, MSc, PhD, N/A)?

PhD

Main supervisor (name and email) and his / her institution

Prof. Phuti Ngoepe Phuti.ngoepe@ul.ac.za University of Limpopo

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Primary author: Ms LEDWABA, Raesibe Sylvia (Physics)

Co-authors: Dr SAYLE, Dean (University of Kent); Prof. NGOEPE, Phuti (University of Limpopo)

Presenter: Ms LEDWABA, Raesibe Sylvia (Physics)

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