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Evolution of “spinel-layered-spinel” Composites in the Li-Mn-O Nanoarchitectures

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The fast lithium ion diffusion kinetics and superior high rate capability of 2D (nanosheets) and 3D (nanoporous) nanoarchitectures have ignited interest in their utilization as electrode materials for lithium ion batteries. The exceptional performance properties are mainly due to the large surface area of these small particles leading to the shortened lithium ion and electron diffusion path within 3D channels of the electrode material during cycling process, compared to the parent bulk [1, 2]. In the current study, simulated amorphization and recrystallization technique will be employed to generate the nanoarchitectures as was previously employed to generate nano-architectures of binaries such as MnO_2 [3] and ternary Li_2MnO_3 [4]. A wealth of crystallographic defects was captured i.e. grain boundaries and point defects. Microstructures of the resulting models conformed to the spinel polymorph and also indicated the presence of spinel Mn_3O_4 and layered- Li_2MnO_3 . XRD patterns compare favourably with experimental XRDs providing validation of composite formation.

Apply to be considered for a student award (Yes / No)?

yes

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

PhD

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

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Would you like to submit a short paper for the Conference Proceedings (Yes / No)?

Yes

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