

Poster Presentation

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Electrochemical Conversion: Beyond the First Cycle

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Conversion based electrode materials offer increased energy storage compared to conventional intercalation materials due to the multiple electrons that reacts per metal ion. However, loss in capacities upon repeated cycling has limited the development of this technology for commercial application. Most structural studies focus on the first discharge-charge cycle [1,2,3]. To understand the loss in capacities with repeated cycling, studies must be extended beyond the first cycle. In conversion reactions, large structural transformations occur such that the electrode is reduced to the nanoscale. Pair distribution function (PDF) analysis is well suited to characterize the structural changes occurring in such nanomaterials. Conversion based iron fluorides (FeF₃, FeF₂, and FeOF) have been a focus of both structural and mechanistic studies [1,2,3]. An in-depth PDF analysis of what happens beyond the first cycle will be presented for these.

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