

ABSTRACT - POSTER**Next generation cathode materials: optimization of the solution-based synthesis of Mn-based disordered rock salts (DRX) for enhanced batteries**

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Abstract

Mn-based disordered rock salts (DRX) have the potential to replace current Ni and Co-based cathode materials, given their high energy density as well as the cheap and abundant source of precursors, enhancing sustainability in lithium-ion batteries (LIB). Its commercialization is impeded by detrimental short-range order (SRO) at the atomic level, which disrupts lithium percolation channels and reduces battery performance. SRO is promoted by high-temperature synthesis. Here we present a novel solution-based synthesis protocol to produce metastable $\text{Li}_{1.2}\text{Ti}_{0.4}\text{Mn}_{0.4}\text{O}_2$ DRX, opening the door to more sustainable DRX positive electrode materials for LIB. Using XRD diffraction, atomistic simulations, and cell-cycle stability tests, we investigate the material's atomic structure and battery performance.