

Abstract Submitted
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Neutron scattering investigation of Lithium based spinels.¹

WOUTER MONTFROOIJ, MARCUS PETROVIC, MICHAEL KRAUS, University of Missouri, ALEXANDER SCHMETS, Technical University Delft — Lithium based spinels $\text{Li}_x\text{M}_2\text{O}_4$, (with M a transition metal like Mn, V, Ti) offer a rich variety of ground states, depending on the transition metal in question. What makes these materials particularly attractive for both fundamental research as well as for applications is that the Li atoms can easily be extracted from the crystal without affecting the overall spinel structure. The oxidation state of the mixed valent transition metal M will change as a function of Li removal, with the result that the system can go from a disordered state to a long range ordered state. We present new neutron scattering results on a variety of Lithium spinels [$\text{Li}_x\text{Mn}_2\text{O}_4$, LiCoVO_4 , $\text{LiCo}_{0.94}\text{Fe}_{0.06}\text{VO}_4$, LiNiVO_4 , and $\text{LiNi}_{0.94}\text{Fe}_{0.06}\text{VO}_4$]. We discuss the changes in ground states as a function of Lithium content, and we review how the magnetic properties of the transition metal ions influence the electronic properties of the system.

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