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PAPER

Structural, magnetic and electrochemical study of a new active phase obtained by oxidation of a LiFePO_4/C composite†

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In this work, a new phase produced by controlled oxidation of a LiFePO_4/C composite has been isolated and characterized. This new compound preserves mainly an olivine structure, but the complete oxidation of Fe is implied. A significant iron mis-site disorder and vacancy formation is proposed. The new phase demonstrated possession of different spectroscopic, magnetic and electrochemical properties from triphillite–heterosite. AC and DC magnetic susceptibility and specific heat measurements showed that the new phase presented spin-glass behavior. Electrochemical cycling showed that the new phase reacted at 2.5 V, which is a different potential to the heterosite *versus* a Li anode. Moreover, it provoked reversion to the triphillite–heterosite system, although a fraction of the material remained as the oxidized phase.