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THE INCORPORATION OF VANADIUM INTO OLIVINE $LiFePO_4$/C: IMPROVEMENT OF LITHIUM INTERCALATION FROM BOTH ORGANIC AND AQUEOUS ELECTROLYTE

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The simple and fast (malonic acid+glycine)-assisted gel-combustion process, followed by a heat treatment at 750°C under reductive atmosphere, is found to be a very effective way for the synthesis of (V-doped $LiFePO_4$)/C composites. The Rietveld refinement confirms that vanadium incorporation into olivine structure was accompanied by the formation of iron phosphide conducting phase. The coulombic capacity and rate capability of (V-doped $LiFePO_4$)/C composite, in both organic and aqueous electrolyte solutions, were significantly improved relative to an undoped sample, as revealed by both galvanostatic cycling and cyclic voltammetry. The average discharging capacities of ~5mol.%V-doped $LiFePO_4$/C composite in an aqueous $LiNO_3$ solution were 91, 73 and 35 mAh g^{-1} at 1, 10 and 100 C, respectively, with no perceivable capacity fade upon 100 charging/discharging cycles.

P.S.B.15.

STUDY OF MODIFIED TiN COMPOSITES SUITABLE FOR HIGH-TEMPERATURE APPLICATIONS

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Titanium nitride is nowadays industrially widespread due to its high anti-corrosive and electrical properties. TiN is also suitable candidate for desirable high temperature applications (i.e. electrocatalysts, contact or sensors). Paper concerns of the TiN based cermets preparation via modified precipitation and sol-gel reactions that enable decreasing of the necessary costs for TiN coatings or dense ceramics production. Investigation of morphology (SEM), phase and chemical composition (XRD, XPS and Raman study) of prepared TiN particles are discussed as key parameters for understanding of relation between type of synthesis of the particles and required mechanical properties of prepared coatings and their dense ceramic counterparts.