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P.S.A.18.

CARBON COATED $LiFePO_4$ CATHODE MATERIAL OBTAINED BY FREEZE-DRYING METHOD

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One of the most perspective cathode materials for the application in the Li-ion batteries is $LiFePO_4$. It has high theoretical specific capacity, good cycle life and technically suitable flat voltage of 3.45 V versus Li. However, its main disadvantages are low electronic and ionic conductivities which can be overcome by particle size minimization and/or carbon coating. Here is presented the freeze-drying method for the preparation of carbon coated $LiFePO_4$ particles. It involves freezing of a precursor solution, vacuum drying and final calcination of as-dried powder under slightly reductive atmosphere. The main advantage of this preparation process is mixing at the atomic level which provides more homogeneous precursor. Water solutions containing Li^+, PO_4^{3-} and Fe^{2+} ions with the addition of various organic compounds as a carbon source were used as the precursor solutions. The as-prepared powders were fully characterized by means of X-ray powder diffraction, scanning electron microscopy, particle size analyzer and galvanostatic cycling.

P.S.A.19.

$LiFePO_4$ NANOCRYSTALS SYNTHESIS BY HYDROTHERMAL REDUCTION METHOD

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The nanocrystals of $LiFePO_4$ a cathode material for Li-ion batteries were synthesized by simple one – pot combined colloidal hydrothermal reduction approach. The influences of surfactant ratios on nanocrystal formation are investigated. Also extent of surface modification and agglomeration is assessed. The electrochemical performance of material is investigated on as prepared samples and on samples with carbonized surface layer. The XRD, TEM, SEM, FTIR, laser diffraction PSA, magnetic measurements and galvanostatic cycling are performed characterization techniques.