

Thin film electrodes for microbattery produced by Pulsed Laser Deposition

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With the technological advances the needs of high power density microbatteries (MBs) is increasingly urgent. One strategy to obtain MBs is the production of electrodes and electrolytes in form of thin films. For this purpose, Pulsed Laser Deposition (PLD) is a promising technique thanks to the possibility to produce compact and dense films with a controlled thickness and preserved target material stoichiometry. Here PLD has been successfully employed to produce both cathode and anode thin films. In particular, a femtosecond-pulsed laser deposition was applied to anatase target materials for the production of an anodic films of nanoparticles, while a nanosecond-pulsed laser deposition of the Lithium iron phosphate (LFP) was carried out in presence of buffer gas.

Different post-deposition treatments were evaluated and films structure and composition were investigated with a multi-technique approach, cyclic voltammetry and galvanostatic technique were used to demonstrate the electrochemical activity of the obtained thin films in Lithium half cells.