Spray Deposition of $LiFePO_4$ on Al foil as cathode for Li-ion batteries

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The high energy demand of energy storage applications has led to the discovery of sustainable energy storage devices such as the Li-ion batteries, which are one of the most promising solutions. However, Li-ion batteries present a low energy density, which cannot meet the actual requirements of storage systems. In order to improve their electrochemical performance, cathode materials such as $LiFePO_4$ (LFP) have been investigated. LFP presents good cycle performance, high safety and stability, and theoretical capacity of 170 mAh g^{-1}. Nevertheless, the existing fabrication methods of LFP, which have been utilized primarily for the growth of powders are time consuming and use organic solvents.

In order to overcome all the aforementioned limitations, a simple one-step spray growth of $LiFePO_4$ on Al-foil has been performed through an aqueous solution of $LiFePO_4$ (1:1:1) for the fabrication of the cathodes for Li-ion batteries. The structural and morphological features of the electrodes have been investigated before and after the consecutive scans using an aqueous $LiSO_4$ electrolyte. The stability and efficiency of the electrodes using the aqueous electrolyte have also been evaluated through cyclic voltammetry analysis.