PURE AND Mn-DOPED LiNbO$_3$ NANOFOBRES

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Electrospinning is a powerful technique to synthesize polymeric and ceramic fibers. In this work, pure and Mn-doped LiNbO$_3$ nanofibers were synthesized by the electrospinning method, followed by a heat treatment. Niobium ethoxide Nb(OCH$_2$CH$_3$)$_5$, lithium hydroxide (LiOH), manganese acetate Mn(C$_2$H$_3$O$_2$)$_2$ and polyvinylpyrrolidone (PVP), were dissolved in ethanol C$_2$H$_5$OH to obtain the precursor solution. This solution was delivered into a metallic needle at a constant flow rate of 0.3 mL/h by a syringe pump. The metallic needle was connected to a high-voltage power supply and a grounded aluminum foil was placed 15 cm the needle tip, where the as-spun composite is collected.

In order to determine the annealing temperature to reach the desired LiNbO$_3$ and LiNb$_{1-x}$Mn$_x$O$_3$ compounds, the thermal stability of as-spun composites were analyzed by thermogravimetry-differential scanning calorimetry (TGA–DSC). Morphology and microstructural characterization of calcined nanofibers were performed by X-ray diffraction (XRD) measurements, Field-emission scanning electron microscopy (FESEM) and High-Resolution Transmission Electron Microscopy (HRTEM). Further material identification was conducted by acquiring Raman spectra.

Pure and Mn-doped LiNbO$_3$ nanofibers have been successfully prepared by electrospinning process followed by calcination at 700 Â°C for 2 h, showing a length of few µm and formed by irregular shaped nanoparticles with size between 40 and 120 nm.

**Keywords:** Nanofibers, LiNbO$_3$, Doped

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