

## **Preparation of Nanophotonics LiNbO<sub>3</sub> Thin Films and Studying Their Morphological and Structural Properties by Sol-Gel Method for Waveguide Applications**

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**Abstract :** Lithium niobate (LiNbO<sub>3</sub>) nanostructures are prepared on quartz substrate by the sol-gel method. They have been deposited with different molarity concentration and annealed at 500°C. These samples are characterized and analyzed by X-ray diffraction (XRD), Scanning Electron Microscope (SEM) and Atomic Force Microscopy (AFM). The measured results showed an importance increasing in molarity concentrations that indicate the structure starts to become crystal, regular, homogeneous, well crystal distributed, which made it more suitable for optical waveguide application.

**Keywords :** lithium niobate, morphological properties, thin film, pechini method, XRD

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