

ALL SOLID THIN FILM BATTERIES

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Lithium batteries (LIB) are extensively used in wide range of electrical and electronic devices such as laptops, desktop computers and mobile phones to most of the electrical vehicles. All solid batteries composed of cathode, anode and electrolyte in solid form and has several advantages such as improved safety, absence of leakage related issues, high energy and power density compared to the conventional Li ion batteries having liquid electrolytes. In the present case, feasibility of making epitaxial cathode material thin films (Ex: LiCoO_2 , Li_2MnO_3 etc...) of different orientations and utilization of the SrRuO_3 layer as a bottom electrode for measuring electrochemical properties of cathode films will be presented. In addition to that, growth and evaluation of dielectric properties of Li ionic conducting (Ex: LiLaTiO_3) thin films on STO (100) and (111) substrates at different oxygen partial pressures will be demonstrated. Growth and characterization of anode materials for the thin film based all solid batteries started with Li based oxide materials such as $\text{Li}_4\text{Ti}_5\text{O}_{12}$ and LiTi_2O_4 will be presented. Possibilities of fabrication of complete all solid thin film battery device will be discussed at the end.

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