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Structural, optical and electrochemical properties of SnO_{2-x} thin films ROHAN BANDEKAR, M.B. SAHANA, SUDAKAR CHANDRAN, RATNA NAIK, Department of Physics and Astronomy, Wayne State University, Detroit, MI 48201, VAMAN M. NAIK, Department of Natural Sciences, University of Michigan-Dearborn, Dearborn, MI 48128 — Tin dioxide is considered to be one of the promising anode materials for Li-ion battery because it has high energy density ($\sim 780 \text{ mAhg}^{-1}$). We synthesized SnO_{2-x} thin films by a facile cost effective method of metalorganic decomposition technique using Tin 2 ethylhexanoate as the precursor. Ten layers of precursor solution are spin coated on stainless steel substrates and processed at $500^{\text{circ}}\text{C}$ for two minutes after each coating. The resulting films were annealed at various ambient such as air, hydrogen (10% in Ar) and high vacuum (10^{-6} torr) at different temperatures from $500^{\text{circ}}\text{C}$ to $700^{\text{circ}}\text{C}$. The structure and composition of these films were analyzed by Raman spectroscopy, x-ray diffraction, scanning and transmission electron microscopy, and X-ray photoelectron spectroscopy to study the effect of synthesis condition on crystallinity, microstructure, and chemical composition. We also prepared thin films on ITO coated glass/quartz substrates under identical conditions for optical analysis. The structure and electrochemical property correlations of these films processed under different ambient will be presented.

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