

COMPLEX OXIDES: ION BEAM ANALYSIS AND ION BEAM FORMATION

M. Morales¹, R. Lopez^{1,2}, T. Haynes², R. F. Haglund¹, L. Boatner² and L.C. Feldman^{1,2},
Depart. of Physics and Astronomy, Vanderbilt University², Solid State Division, Oak Ridge
National Lab.

Ion beam science plays a significant role in both the analysis and the formation of complex oxides. We demonstrate the role of analysis in studies of pulsed laser deposition growth of the transparent conductor $\text{In}_x\text{Sn}_y\text{O}_z$. Careful stoichiometry analysis allows new insights into the correlation of the growth properties and the electronic properties of this important optical material.

Oxide formation is illustrated using implantation creation of VO_2 nanocrystals. We show that the nanocrystal size, controlled via annealing, has a large effect on the kinetics of the semiconductor to metal transition, an intrinsic property of bulk VO_2 .

Oak Ridge National Laboratory, managed by UT-Battelle, LLC, for the U.S. Dept. of Energy under contract DE-AC05-00OR22725.

"The submitted manuscript has been authored by a contractor of the U.S. Government under contract No. DE-AC05-00OR22725. Accordingly, the U.S. Government retains a nonexclusive, royalty-free license to publish or reproduce the published form of this contribution, or allow others to do so, for U.S. Government purposes."