Abstract Submitted
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Relationship between shallow donors and H impurities in In_2O_3 from their behavior upon annealing[1] KIRBY SMITHE, University of Tulsa, WEIKAI YIN, MICHAEL STAVOLA, Lehigh University, LYNN BOATNER, Oak Ridge National Lab — Indium oxide is a transparent conducting oxide used widely in modern electronics [1]. Theory predicts that interstitial H and H trapped by an oxygen vacancy act as shallow donors [2]. We have introduced H into In_2O_3 single crystals to produce O-H centers and also the broad IR absorption arising from free carriers. To investigate the relationship between the O-H centers and the shallow donors that are introduced by H, we have studied the annealing behavior of the O-H local vibrational modes and the free-carrier absorption by IR spectroscopy to determine how these spectral features are correlated. [1] M. McCluskey *et al.*, J. Mater. Res. **27**, 2190 (2012) [2] S. Limpijumnong *et al.*, Phys. Rev. B **80**, 193202 (2009).

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