

Abstract Submitted
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H and D centers in In_2O_3 studied by IR spectroscopy¹ WEIKAI YIN, Lehigh University, KIRBY SMITHE, University of Tulsa, MICHAEL STAVOLA, W. BEALL FOWLER, Lehigh University, L.A. BOATNER, Oak Ridge National Lab — Hydrogen has been predicted to be an important source of n-type conductivity in transparent conducting oxides (TCO's) [1]. We have used IR spectroscopy to investigate the properties of H (and D) in single crystals of the prototypical TCO, In_2O_3 , and to test the predictions of recent theory [2]. H (or D) introduces several O-H (or O-D) stretching lines and also the broad absorption arising from free carriers. We have used the vibrational properties of H- (and D-) containing centers as a probe of microscopic structure and as a strategy to monitor H-related reactions that occur upon annealing. [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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