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Nitrogen-hydrogen complexes in ZnO: A possible route toward p-type conductivity.[1] M.D. MCCLUSKEY, Washington State University, S.J. JOKELA, University of Georgia — Zinc oxide (ZnO) is a wide band gap II-VI semiconductor with optical, electronic, and mechanical applications. The lack of reliable *p*-type doping, however, has prevented it from competing with other semiconductors such as GaN. In this talk, I describe the successful incorporation of nitrogen-hydrogen (N-H) complexes in ZnO during chemical vapor transport (CVT) growth, using ammonia as an ambient. The N-H bond-stretching mode gives rise to an infrared (IR) absorption peak at 3150.6 cm^{-1}. Isotopic substitutions for hydrogen and nitrogen result in the expected frequency shifts, thereby providing an unambiguous identification of these complexes. The N-H complexes are stable up to $\sim$700 $^{\circ}$C. The introduction of neutral N-H complexes could prove useful in achieving reliable *p*-type conductivity in ZnO.

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