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UV-induced stable photoconductivity in Indium Oxide films EHAB ABDELHAMID, RUPAM MUKHERJEE, Wayne State University, DE-BABRATA MISHRA, Weizmann Institute of Science, AMBESH DIXIT, Indian Institute of Technology Rajasthan, BORIS NADGORNY, GAVIN LAWES, Wayne State University, GAVIN LAWES GROUP TEAM, BORIS NADGORNY GROUP TEAM — We have investigated the effects of UV radiation on the electrical conductivity of sputter deposited Indium Oxide films for samples annealed under different conditions. The films were annealed in air, hydrogen, argon, nitrogen, and vacuum to modify the microstructure and distribution of point defects. X-ray diffraction shows the formation of polycrystalline single phase films, with the average crystallite size changing under different annealing conditions. We find that the resistance sharply decreases to between 0.1% and 50% of its initial value on exposure to UV irradiation. The magnitude of the decrease depending on the annealing conditions, with the largest relative change occurring in the as-prepared sample (high initial resistance), and the smallest decrease observed in the Hydrogen-annealed film (low initial resistance). This low resistant state is surprisingly stable, having a time constant of several hours or longer to relax to the initial value after the UV illumination is removed.

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