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Plasma Treatment of Pulsed DC Magnetron Sputtered Indium Tin Oxide AMBER REED, Wright State University, Air Force Research Laboratory/RXBT, University of Dayton Research Institute, JOHN JONES, Air Force Research Laboratory (AFRL/RXBT), DOUG PETKIE, Wright State University — Crystalline indium tin oxide (ITO) is optically transparent and electrically conductive. ITO deposited with magnetron sputtering is amorphous. Typically these films are treated with post-deposition annealing to crystallize the films. The annealing temperature of $>300^{\circ}\text{C}$ required can prohibit deposition on polymer substrates. In the current work, the effects of pulse parameters in mid-frequency pulsed dc on as-deposited film composition and structure were investigated, as well as a post-deposition RF plasma treatment process designed to promote crystallization of the films on polymer substrates from ion bombardment. Raman spectroscopy was used to show that the degree of film crystallization was dependent on the frequency and duty factor of the pulsed power supply used for deposition, as well as the parameters selected for the post-deposition RF plasma treatment. The film's conductivity was measured before and after the plasma treatment. XPS was used to determine dependence of the processing parameters on the chemical composition of the ITO films.

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