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Role of annealing temperature on microstructural and electro-optical properties of ITO films produced by sputtering ABDULKADIR SENOL, Department of Physics, Kastamonu University, MAHIR GULEN, GURCAN YILDIRIM, OZGUR OZTURK, AHMET VARILCI, CABIR TERZIOGLU, IBRAHIM BELENLI, Department of Physics, Abant Izzet Baysal University — In this study, we investigate the effect of annealing temperature on electrical, optical and microstructural properties of indium tin oxide (ITO) films deposited onto Soda lime glass substrates by conventional direct current (DC) magnetron reactive sputtering technique at 100 watt using an ITO ceramic target (In_2O_3:SnO_2, 90:10 wt. %) in argon atmosphere at room temperature. The films obtained are exposed to the calcination process at different temperature up to 700 ° C. Resistivity, Hall Effect, X–ray diffractometer (XRD), ultra violet-visible spectrometer (UV–vis) and atomic force microscopy (AFM) measurements are performed to characterize the samples. Moreover, phase purity, surface morphology, optical and photocatalytic properties of the films are compared with each other. Furthermore, mobility, carrier density and conductivity characteristics of the samples prepared are carried out as function of temperature in the range of 80-300 K at the magnetic field of 0.550 T. The results obtained show that all the properties depend strongly on the annealing temperature and in fact the film annealed at 400 ° C obtains the better optical properties due to the high refractive index while the film produced at 100 °C exhibits much better photoactivity than the other films as a result of the large optical energy band gap.

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