UNIVERSITI TEKNOLOGI MARA

CHARACTERIZATION OF THIN FILM ALUMINUM DOPED ZINC OXIDE FOR SOLAR CELL APPLICATION

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Abstract

Thin films have been used for more than a half century in making electronic devices, optical coatings, instrument hard coatings, and decorative parts. The thin film is a traditional well-established material technology. The transparent conducting oxide is a thin oxide film which possesses low resistivity and high optical transmittance over 80%. Aluminum doped zinc oxide (AZO) is a promising transparent conducting oxide (TCO), which have the advantages of low material cost, low toxicity and chemical stability in reducing ambient over ITO. In this research work, Al-doped ZnO (AZO) films were prepared by RF magnetron sputtering with home-made ZnO targets. Thin AZo film which will be used in solar cell was fabricated on bare glass substrate by using AZO as the target. The parameter of sputtering process is the deposition time. SEM, XRD, AFM, UV-Vis are used to characterize the AZO films. The results indicate that the optimum condition is achieved when sputtering time is 45 minutes giving the good surface morphology, high crystallinity, low resistivity and high transmittance.

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