Zn1-xAlxO:NiO Composite Transparent Conducting Oxide Thin Film/p-Type Silicon Photodiodes

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Abstract

Zn1-xAlxO:NiO composite transparent conducting oxide thin films were prepared by sol gel method to prepare Zn1-xAlxO:NiO/p-type silicon photodiodes. The structural properties of the films were analyzed by AFM measurements. The diodes were coated on p-type silicon having ohmic contact by sol gel spin coating method. The ideality factor and barrier height values of the diodes were obtained. The photoresponse properties of the diodes were performed under solar light illuminations. It was found that the photocurrent of the diodes is higher than the dark current. This indicates that the diodes exhibited a photodiode behavior. The obtained results indicate that the photoresponse properties of Zn1-xAlxO:NiO composite transparent conducting oxide thin film/p-type silicon photodiodes are controlled by NiO doping.

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