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Characterization of defects in Ar+ implanted ZnO semiconductor using positron annihilation technique.

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Defects investigations were carried out in wurzite ZnO of space group P6_3mc, which were generated by 150 keV Ar+ ions during the implantation with fluencies from 10ˆ4 to 10ˆ16 cm-2. RBS technique was used to determine which elements are in the sample after implantation and X-ray diffraction was utilized to determine the presence of phase change or structural damage or both that might have occured during the implantation process. Local density approximation (LDA) and generalized gradient approximation (GGA) models were employed to theoretically determine the corresponding S-parameters., Thereafter, Doppler broadening of the annihilation centroids were obtained and S-parameters ranging from 0.35975 to 0.38995 at different fluences were then determined. Theoretical values agree with the experimental values. The theoretical positron lifetimes calculation through GGA suggests the formation of Zn+ vacancies.

Apply to be considered for a student ; award (Yes / No)?

Yes

Level for award;(Hons, MSc, PhD, N/A)?

MSc

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