

Microstructural and optical characteristics of Al-doped ZnO nanorod arrays grown on a silicon substrate by a simple hydrothermal synthesis

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Well-aligned Al-doped ZnO nanorod arrays with different Al atomic concentrations have been successfully grown on a silicon substrate using a low temperature hydrothermal method. The microstructure characteristics, elemental composition and optical properties of Al-doped ZnO nanorod arrays were investigated. Results show that the optical properties of ZnO nanorod arrays synthesized hydrothermally using different zinc and aluminum precursors can be improved greatly by Al doping, which can be attributed to the decrease in oxygen deficiency in the ZnO nanorod arrays. To our knowledge, it is the first report that Al has been doped successfully into solution-grown ZnO nanorod arrays on a silicon substrate.