

The Effects of B and Ga co-doped ZnO Electron Transporting Layer on the Properties of n-ZnO /p-GaN UV Photodetector

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Recently, ZnO has attracted much attention in short wavelength optoelectronic devices and sensors [1-2] due to its direct wide optical bandgap (3.37eV) and high exciton binding energy (60meV). Also ZnO is intrinsically an n-type semiconductor and can easily be a heterojunction with other p-type materials, such as p-Si, p-NiO, p-SiC, p-GaN as well as some p-type organic-polymers. Based on the very good characteristics of ZnO mentioned above, it is very popular to be chosen as electron selective layer in ultraviolet (UV) photodetectors (PDs) [3-4].

B and Ga co-doped ZnO (BGZO), as a transparent conduction oxide electrode, has many good physical properties, such as high electrical conductivity, excellent optical transparency and thermal stability, which would replace the traditional ITO or FTO due to its low cost and easy process [5]. Herein, we prepared BGZO with different thicknesses as an electron transporting layer of the ZnO /GaN heterojunction and the ultraviolet photoresponse characteristics of the devices were investigated. From the results, we find that the PDs with BGZO coating showed higher responsivity.

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