ZnO-Based Photoconductive UV Detector.

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Wide band gap ZnO(E_g=3.37 eV @RT)-based photoconductive UV detector was simply fabricated and characterized. The undoped-ZnO thin films with 0.5 μm thickness were grown on sapphire single crystal substrate by RF magnetron sputtering. The resistivity of ZnO thin film were about 300 Ω cm. As ohmic metals, Au and Al were deposited on the ZnO film by thermal evaporation, and the I-V characteristic curve was examined. In case of Au contact, the I-V measurement showed better ohmic contact behavior than Al(Fig. 1). When photocurrent was measured as the wavelength was varied, there was no change of photoresponse in the visible range. But the photocurrent showed the maximum at λ=375 nm(Fig. 2). At 1 and –1 V, the spectra are symmetric. And we measured the dark current and the photocurrent from -3 V to 3 V(Fig. 3). So “visible-blind” UV detector using undoped ZnO thin films could be fabricated.

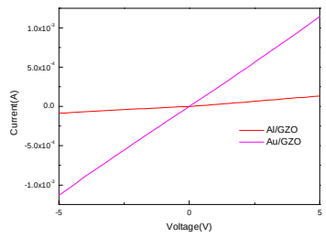

Fig. 1 I-V characteristics of Al and Au on the ZnO.

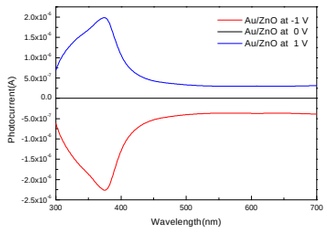

Fig. 2 Spectral response of ZnO photoconductive UV detector with a maximum peak position at 375 nm.

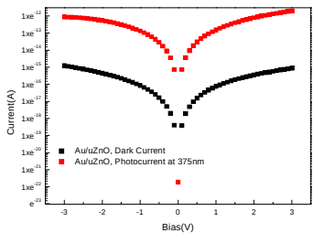

Fig. 3 Current-Voltage characteristic of ZnO-based photoconductive UV detector