

ZnO 나노선과 HgTe 나노입자 박막을 이용한 pn 접합 다이오드

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A pn diode constructed with an n-type ZnO nanowire and a p-type HgTe nanoparticle thin film

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Abstract : We propose a novel nanomaterial-based pn diode which constructed with an n-type ZnO nanowire (NW) and a p-type HgTe nanoparticle (NP) thin film. The photocurrent characteristics of a ZnO NW, a HgTe NP thin film and pn diode constructed with a ZnO NW and a HgTe NP thin film were investigated under illumination of the 325 nm and 633 nm wavelength light. The conductivities of a ZnO NW exposed to the 325 nm and 633 nm wavelength light increased, while the photocurrents taken from the HgTe NP thin film was very close to the dark currents. Moreover, The pn diode exhibited the rectifying characteristics of the dark current and of the photocurrent excited by the 633 nm wavelength light. In contrast, the ohmic characteristics for the photocurrent were observed due to the junction barrier lowering in the conduction band of the ZnO nanowire under the illumination of the 325 nm wavelength light.

Key Words : ZnO, HgTe, nanowire, thin film, diode