

ZnO nanorod ultraviolet photodetector on porous silicon substrate

Abstract

Vertically high-density ZnO nanorods were successfully synthesized on a porous silicon (PS) substrate by chemical bath deposition method. The structural and optical investigations revealed that the ZnO nanorods grown on the PS substrate had high structural and optical quality. The photoelectric properties of the fabricated photodetector were investigated with 325 nm UV light illumination under 1 V bias voltage. Based on the current-voltage curve, the responsivity of the ZnO nanorod photodetector was 1.738 A W^{-1} at 1 V bias voltage. Under a bias voltage of 1 V, the sensitivity of the ZnO nanorod device was 20. The response and recovery time of the ZnO nanorod photodetector under these conditions were 0.032 and 0.041 s, respectively.

Keywords

Porous silicon (PS) substrate; Current voltage curve; Optical investigation; Photoelectric property