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# Fabrication of ZnO/CdS, ZnO/CdO Core/shell Nanorod Arrays and Investigation of Their Ethanol Gas Sensing Properties

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## ABSTRACT:

The sensing properties of ZnO/CdS and ZnO/CdO core/shell nanorod arrays were studied for ethanol gas sensing. ZnO nanorod arrays were synthesized on sputtered ZnO films through a simple hydrothermal method, and CdS films were then deposited on the ZnO nanorods by successive ionic layer adsorption and reaction (SILAR). After air annealing of the ZnO/CdS core/shell nanorods at 400°C for 2 h, the CdS films were converted to CdO films. Using scanning electron microscopy (SEM), X-ray diffraction (XRD), transmission electron microscopy (TEM) and diffused reflectance spectroscopy (DRS), ZnO/CdS and ZnO/CdO core/shell nanorod heterostructures were characterized. With respect to ethanol gas sensing, the ZnO/CdO core/shell nanorods exhibited highly enhanced responses compared to those of the ZnO/CdS core/shell nanorods. Based on the gas sensing mechanism, the effects of CdS and CdO shells on ZnO nanorod array gas sensors were discussed.

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