



# Novel hydrogen gas sensor based on single ZnO nanorod

Oleg Lupan, Guangyu Chai, Lee Chow,

<https://doi.org/10.1016/j.mee.2008.06.021>

## Abstract

For extensive use in an industrialized process of individual ZnO nano/microrods as building nanoblock in novel hydrogen sensors, a simple, inexpensive, and bio-safe synthesis process and nanofabrication route is required. Here, we report a cost-effective and fast synthesis route for ZnO one-dimensional nanorod using an aqueous-based approach in a reactor. Our synthesis technique permits nano/microrods to be easily transferred to other substrates and to be distributed on the surface. This flexibility of substrate choice opens the possibility of using focused ion beam (FIB/SEM) system for handling and fabricating nanosensors. The main advantage of this procedure is a quick verification/testing of concept and is compatible with micro/nanoelectronic devices. The described nanofabrication steps permitted us to obtain a 90% success rate for building single nanorod sensor. A sensitivity of ~ 4% was obtained for a single ZnO nanorod hydrogen sensor at 200 ppm H<sub>2</sub> in the air at room temperature. The nanosensor has a high selectivity for H<sub>2</sub>, since its sensitivity for O<sub>2</sub>, CH<sub>4</sub>, CO, ethanol or LPG are less than 0.25%.