
ZnO-SnO₂ Nanoheterostructures : Microwave synthesis and UV-enhanced gas sensing properties

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Abstract

Metal oxide semiconductors (MOS) have attracted considerable interest from many researchers due to their numerous technological applications such as gas sensor, particularly, operated at room-temperature under UV-illumination. In this work, we report the preparation of the ZnO-SnO₂ nanoheterostructures via microwave-assisted sol-gel route. The XRD measurements indicated the presence of both crystalline phases, i.e., ZnO and SnO₂, without the evidence of solid solution formation. HRTEM analyses revealed that SnO₂ nanoparticles (of ca. 5 nm) are attached onto ZnO rods, supporting the existence of junction between both oxides. Electrical measurements revealed that the heterostructures presented a high response to ppb levels of ozone and nitrogen dioxide at room temperature when kept under continuous UV-light illumination.

Keywords: Gas sensor, Microwave synthesis, UV illumination, ZnO, SnO₂, Nanoheterostructure

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