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Properties of Porous InGaNbased Hydrogen Gas Sensor

R. Radzali[1,2], Z. Hassan[1], N. Zainal[1], F.K. Yam[1]

[1]*Institute of Nano Optoelectronics Research and Technology (INOR), School of Physics, Universiti Sains Malaysia, 11800 Penang, Malaysia.*
[2]*Faculty of Electrical Engineering, Universiti Teknologi MARA,Jalan Permatang Pauh, 13500 Permatang Pauh, Pulau Pinang, Malaysia.*

The research of porous III-Nitrides has drawn much attention in the past years. This is due to porous III-Nitrides excellent properties such as high surface area to volume ratio, the shift of band gap and efficient luminescence which makes the porous III-Nitrides become attractive for the application in optoelectronics and sensing devices. In this work, the development of gas sensors based on PtSchottky contact on porous InGaN for hydrogen gas sensing ispresented. Porous InGaN samples were successfully fabricated by UV-assisted electrochemical etching in a diluted solution of KOH. From the field emission scanning electron microscopy (FESEM) image, the porous InGaN sample exhibited rough surface morphology with a high density of pores. Subsequently, for the fabrication of gas sensors, Schottky contacts of using platinum (Pt) that acted as catalytic layer were deposited on as-grown and porous InGaN samples. The effects of porous structure on the performance of the hydrogen gas sensor was investigated. The Pt/porous InGaN gas sensor showed higher sensitivity than the as-grown InGaN gas sensor upon introduction to 0.1% H_2 in N_2 at room temperature. The high sensitivity of porous gas sensor was due to thehigh surface to volume ratio of the porous structure. The high sensitivity of hydrogen gas sensor is required to make sure the safety of people, property and environment whenever hydrogen gas is consumed.