

Nanocrystalline Na_{0.1}V₂O₅.nH₂O xerogel Thin Film for Gas Sensing

Authors : M. S. Al-Assiri, M. M. El-Desoky, A. A. Bahgat

Abstract : Nanocrystalline thin film of Na_{0.1}V₂O₅.nH₂O xerogel obtained by sol-gel synthesis was used as a gas sensor. Gas sensing properties of different gases such as hydrogen, petroleum and humidity were investigated. Applying XRD and TEM the size of the nanocrystals is found to be 7.5 nm. SEM shows a highly porous structure with submicron meter-sized voids present throughout the sample. FTIR measurement shows different chemical groups identifying the obtained series of gels. The sample was n-type semiconductor according to the thermoelectric power and electrical conductivity. It can be seen that the sensor response curves from 130°C to 150°C show a rapid increase in sensitivity for all types of gas injection, low response values for heating period and the rapid high response values for cooling period. This result may suggest that this material is able to act as gas sensor during the heating and cooling process.

Keywords : sol-gel, thermoelectric power, XRD, TEM, gas sensing

Conference Title : ICNST 2014 : International Conference on Nano Science and Technology

Conference Location : Kuala Lumpur, Malaysia

Conference Dates : August 25-26, 2014