

In₂O₃-CuO nano-flakes prepared by spray pyrolysis for gas sensing application

Detection of metal oxide

gas sensors depends on the absorbed oxygen which is converted to ion species by trapping electrons from the surface of the material [1]. The change in the resistance of the sensor usually occurs due to the interaction between the target gas with the adsorbed oxygen species, which causes the resistance to change as a signal due to the return or extracted additional electrons from the semiconductor surface [2]. To obtain a sensor of high sensitivity, one must study the mechanism of the interaction between the gas (within the lowest concentration) and the surface of the material then convert this reaction to the equivalent changes in the electrical resistance of the sensor [3]. The ternary compounds copper-indium-oxide are known to be attractive in many fields such as in transparency electrodes [4], photodetectors [5], liquid crystal displays [6]. The green (Cu₂In₂O₅) and black (CuIn₂O₄) compounds are formed when the CuO interacts with In₂O₃. [7]. One of the interesting ternary phases is the Cu₂In₂O₅ which crystallized in the orthorhombic system, it is an oxygen-rich phase and can easily be prepared by the solid-state synthesis in the air [8].