Synthesis of Dopant Zno Thin Films with Al Using Dip Coating for Gas Sensors

Abstract- The sol-gel technique (dip coating method) used to synthesize pure Zinc Oxide and Aluminum doped Zinc Oxide thin films on glass substrate for gas sensing application. Zinc acetate dehydrate was used as source of Zinc ions. The influence of annealing temperature of pure ZnO thin films with three different temperatures (300, 400, and 500 °C), Aluminum dopant concentration with two different concentration (3wt% and 5wt%) and annealing temperature for AZO thin films with three different temperatures (300, 400, and 500 °C) on gas sensing properties was studied. The results show that ZnO was to be sensitive toward CO gas and its sensitivity decrease with increase in annealing temperature of pure ZnO and (5wt.%) AZO thin films. It is found that the sensitivity of pure ZnO thin films decrease from 67% at 300 °C to 54% and 38% at 400 and 500 °C respectively. Likewise, for 5wt. % AZO thin film the sensitivity improved by increase the Aluminum dopant concentration with fixed annealing temperature 500 °C. It is found that the sensitivity increase form 49% to 57% when doped with Al at (3 wt. %) and (5 wt. %) respectively.

Keywords- AZO, Dip coating, Sol-Gel, ZnO.