

Study the Influence of Zn in Zn-MgFe₂O₄ Nanoparticles for CO₂ Gas Sensors

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Abstract : Zn-doped MgFe₂O₄ nanoparticles (ZMFO) (Zn=0.0, 0.2, 0.35, 0.5,) were prepared by Co-precipitation synthesis route. Structural and morphological analysis confirmed the formation of spinel cubic nanostructure by X-Ray diffraction (XRD) data shows high reactive surface area owing to a small average particle size of about 14 nm, which greatly influences the gas sensing mechanism. The gas sensing property of ZMFO for several gases was obtained by measuring the resistance as a function of different factors, like composition and response time in air and in the presence of gas. The sensitivity of spinel ferrite to gases CO₂, O₂, and O₂ at room temperature has been compared. The nanostructured ZMFO exhibited high sensitivity in the order of CO₂>O₂ and showed a good response time of (~1min) to CO₂, demonstrating that this expanse of research can be used in the field of gas sensors devising high sensitivity and good selectivity at 25°C.

Keywords : MgFe₂O₄ nanoparticles, hydrothermal synthesis, gas sensing properties, XRD

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