

Structural and Electromagnetic Properties of CoFe₂O₄-ZrO₂ Nanocomposites

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Abstract : The nanocomposites of CoFe₂O₄-xZrO₂ with different loadings of ZrO₂ (x = 0.025, 0.05, 0.075, 0.1 and 1.5) were prepared using ball mill method. All the samples were prepared at 980°C/1h using microwave sintering method. The x-ray diffraction patterns show the existence of tetragonal/monoclinic phase of ZrO₂ and cubic phase of CoFe₂O₄. The effects of ZrO₂ on structural and microstructural properties of CoFe₂O₄ composite ceramics were investigated. It is observed that the density of the composite decreases and porosity increases with x. The magnetic properties such as saturation magnetization (Ms), and Coercive field were calculated at room temperature. The Ms is decreased with x while coercive field is increased with x. The dielectric parameters exhibit the relaxation behavior in high-frequency region and showing increasing trend with ZrO₂ concentration, showing suitable

Keywords : dielectric properties, magnetic properties, microwave sintering, nanocomposites

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