

INTISARI

PENGARUH KOMPOSISI Co DAN Zn TERHADAP SUSEPTIBILITAS PADA NANOPARTIKEL MAGNETIK COBALT ZINC FERRITE (Co_{1-x}Zn_xFe₂O₄)

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Nanopartikel magnetik Co_(1-x)Zn_(x)Fe₂O₄ telah berhasil disintesis menggunakan metode kopresipitasi. Ukuran kristalit ditemukan menurun dari 10,3 hingga 9,8 nm dengan meningkatnya konsentrasi Zn. Pengukuran suseptibilitas nanopartikel magnetik Co_(1-x)Zn_(x)Fe₂O₄ dilakukan dengan metode Gouy dengan konsentrasi Zn 0,2; 0,4; 0,6; 0,8; 1,0. Berdasarkan hasil pengukuran, diperoleh nilai suseptibilitas berturut-turut $(1,5 \pm 0,2) \times 10^{-2} \text{ m}^3/\text{kg}$, $(2,3 \pm 0,2) \times 10^{-3} \text{ m}^3/\text{kg}$, $(6,7 \pm 0,7) \times 10^{-4} \text{ m}^3/\text{kg}$, $(9,3 \pm 0,8) \times 10^{-5} \text{ m}^3/\text{kg}$, $(1,8 \pm 0,1) \times 10^{-5} \text{ m}^3/\text{kg}$. Hasil penelitian menunjukkan bahwa konsentrasi Zn mempengaruhi nilai suseptibilitas Co_(1-x)Zn_(x)Fe₂O₄. Semakin besar konsentrasi Zn maka nilai suseptibilitas Co_(1-x)Zn_(x)Fe₂O₄ semakin kecil.

Kata Kunci : nanopartikel magnetik Co_(1-x)Zn_(x)Fe₂O₄, kopresipitasi, konsentrasi Zn, suseptibilitas magnetik.

ABSTRACT

THE EFFECT OF COMPOSITION Co AND Zn TO SUSCEPTIBILITY OF MAGNETIC NANOPARTICLES COBALT ZINC FERRITE (Co_{1-x}Zn_xFe₂O₄)

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Cobalt Zinc Ferrite (Co_(1-x)Zn_(x)Fe₂O₄) magnetic nanoparticles has been successfully synthesized using coprecipitation method. The crystallite size of nanoparticles was found decreased from 10,3 to 9,8 nm by increasing Zn concentration. Susceptibility of (Co_(1-x)Zn_(x)Fe₂O₄) magnetic nanoparticles have been analyzed using Gouy method with Zn concentration 0,2; 0,4; 0,6; 0,8; 1,0. The result of susceptibility on value of x concentration are $(1,5 \pm 0,2) \times 10^{-2} \text{ m}^3/\text{kg}$, $(2,3 \pm 0,2) \times 10^{-3} \text{ m}^3/\text{kg}$, $(6,7 \pm 0,7) \times 10^{-4} \text{ m}^3/\text{kg}$, $(9,3 \pm 0,8) \times 10^{-5} \text{ m}^3/\text{kg}$, $(1,8 \pm 0,1) \times 10^{-5} \text{ m}^3/\text{kg}$. The susceptibility value of Co_(1-x)Zn_(x)Fe₂O₄, are effected by Zn concentration. The increasing by Zn concentration which has been given, make the value of susceptibility of Co_(1-x)Zn_(x)Fe₂O₄ became decrease.

Keywords : magnetic nanoparticles Co_(1-x)Zn_(x)Fe₂O₄, coprecipitation, Zn concentration, magnetic susceptibility