

Pengaruh proses perlakuan panas terhadap ukuran kristal dan sifat magnetik BaFe₁₂O₁₉ didoping bi dibuat melalui metode sol gel = The influence of heat treatment on the crystallite size and magnetic properties of BaFe₁₂O₁₉ doped by bi made by sol gels method

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Abstrak

Material BaFe₁₂O₁₉ dan material paduan Ba_{1-x}BixFe₁₂O₁₉ dengan nilai $x \geq 0.2$ telah berhasil dibuat melalui metode sol gel. Prekursor ferit diperoleh dari campuran larutan barium nitrat ferit nitrat dan bismut nitrat. Prekursor ini disinter pada temperatur 925 °C dengan variasi waktu 6, 8 dan 10 jam pada tekanan udara 1 atm. Pengaruh dari temperatur sintering pada kristalografi dan sifat magnetik. Material BaFe₁₂O₁₉ dan material paduan Ba_{1-x}BixFe₁₂O₁₉ menjadi fokus yang akan dipelajari. Material-material ini akan dikarakterisasi dengan menggunakan X ray diffraction XRD scanning electron microscope SEM and Permagraph.

Hasil karakterisasi XRD menunjukkan bahwa material BaFe₁₂O₁₉ dan Ba_{1-x}BixFe₁₂O₁₉ memiliki struktur kristal hexagonal. Secara umum hasil pengujian Permagraph pada suhu ruang menunjukkan kedua material tersebut bersifat ferromagnetik dengan nilai medan magnet saturasi medan koersif dan magnetisasi remanen yang berbeda. Akan tetapi persamaan yang dimiliki kedua material ini adalah dengan semakin meningkatnya temperatur sintering dan waktu penahanan sintering maka nilai medan magnet saturasi medan koersif dan magnetisasi remanen juga semakin meningkat.

<hr><i>BaFe₁₂O₁₉ compounds and Ba_{1-x}BixFe₁₂O₁₉ compounds which is $x \geq 0.2$ have been made by sol gel methode. The ferrite precursors were obtained from aqueous mixtures of Barium nitrate Bismuth nitrate and Ferric nitrate. These precursors were sintered at temperature 925 °C with time variation 6, 8 and 10 in a static air atmosphere. Effects of sintering temperature on the crystallography and magnetic properties to BaFe₁₂O₁₉ compounds and Ba_{1-x}BixFe₁₂O₁₉ compounds were systematically studied. The powders formed were investigated using X ray diffraction XRD scanning electron microscope SEM and Permagraph.

The XRD characterization showed that the BaFe₁₂O₁₉ and Ba_{1-x}BixFe₁₂O₁₉ compounds crystal structure are hexagonal. The main finding of permagraph characterization at the room temperature showed that the compounds are ferromagnetic matter which are the magnetic saturation koersif field and remanence magnetization are different. With increasing of temperature sintering coercivity magnetic saturation and remanence magnetization value tends to rising.</i>