ABSTRAK

Stronsium Ferit yang di doping Nd^{3+} variasi konsentrasi 0; 0,1; 0,2; 0,3 mol % dengan suhu *sintering* 1.100^0C selama 5 jam dibuat menggunakan metode *modified solid state reaction*. Sampel dianalisis fasa kristal, ukuran kristal, sifat magnetik dan penyerapan gelombang mikronya. Metode *modified solid state reaction* merupakan perpaduan antara metode *sol-gel* dan *solid state reaction*, yang meliputi pembuatan larutan prekursor awal, *sol-gel*, pemadatan, pre-*sintering* dan *sintering*. Sampel yang telah dibuat selanjutnya dikarakterisasi dengan alat *X-Ray Diffraction* (XRD), *Vibrating Sample Magnetometer* (VSM) dan *Vector Network Analyzer* (VNA). Hasil karakterisasi menunjukkan bahwa terbentuk fasa kristal yang terbentuk adalah $NdSrFeO_4$ dengan struktur tetragonal. Fasa $NdSrFeO_4$ pada NSF2 (0,1 mol%) terbentuk satu puncak fasa tunggal, pada NSF3 (0,2 mol%) terbentuk intensitas tertinggi, pada NSF4 (0,3 mol%) terbentuk dua puncak fasa tunggal. Ukuran kristal $SrNdFeO_4$ terkecil pada konsentrasi 0,2 mol%. Kurva histerisis menunjukkan bahwa sifat magnet yang terbentuk adalah *soft magnetic* dari ***Hc*** yang ramping serta nilai ***Hc*** terkecil pada NSF3 sehingga sifatnya semakin *soft magnetic*. Serapan gelombang mikro rata-rata yang terbentuk adalah diatas -10 dB. Serapan terbaik pada sampel NSF3 yang memiliki jangkauan frekuensi serap terlebar. Pengaruh variasi konsentrasi doping Nd^{3+} fasa, sifat magnetik dan reflection loss: Bertambahnya konsentrasi doping menyebabkan ukuran kristal serta jumlah fasa $NdSrFeO_4$ semakin meningkat; Bertambahnya konsentrasi doping menyebabkan ***Ms***, ***Mr,*** *dan* ***Hc*** fluktuatif dan ***Hc*** terkecil pada NSF3; Bertambahnya konsentrasi doping menyebabkan nilai *reflection loss* kecil atau penyerapan semakin banyak serta absorbsi semakin banyak.

Kata kunci : Neodimium, Gelombang mikro, Stronsium Ferit, *Modified Solid State Reaction*.

ABSTRACT

Doping strontium ferrite Nd^{3+} concentration variation 0; 0,1; 0.2; 0.3 mol% with 1.100 ^{o}C sintering temperature for 5 hours was made using the modified solid state reaction method. Samples were analyzed for the crystal phase, crystal size, magnetic properties and absorption of microwaves. The modified solid state reaction method is a combination of sol-gel method and solid state reaction, which includes the manufacture of initial precursor solutions, sol-gel, compaction, pre-sintering and sintering. Samples that have been made are then characterized by X-Ray Diffraction (XRD), Vibrating Sample Magnetometer (VSM) and Vector Network Analyzer (VNA) devices. The characterization results show that the formed crystal phase formed is NdSrFeO4 with a tetragonal structure. The phase of NdSrFeO4 in NSF2 (0.1 mol%) formed a single phase peak, in NSF3 (0.2 mol%) the highest intensity was formed, in NSF4 (0.3 mol%) two single peaks were formed. The smallest size of SrNdFeO4 crystals at a concentration of 0.2 mol%. The hysteresis curve shows that the magnetic properties formed are soft magnetic from the slim Hc and the smallest Hc value at NSF3 so that the properties are more soft magnetic. The average microwave uptake formed is above -10 dB. The best absorption in NSF3 samples which has the widest absorption frequency range. Effect of variations in Nd3 doping concentration + phase, magnetic properties and reflection loss: Increased doping concentration causes the size of the crystal and the number of phases of NdSrFeO4 to increase; Increased doping concentration causes Ms, Mr, and fluctuating Hc and the smallest Hc at NSF3; Increased doping concentration causes a smaller reflection loss value or more absorption and more absorption.

Keywords: *Neodymium, Microwaves, Strontium Ferrite, Modified Solid State Reaction.*