

Microwave sintering of Ni-Cr doped strontium hexaferrite synthesized via sol-gel method

ABSTRACT

The magnetic behavior of Strontium hexaferrite ceramics with nominal composition $\text{SrFe}_{12-2x}\text{Ni}_x\text{Cr}_x\text{O}_{19}$ (where $x = 0.2, 0.4, 0.6, 0.8$) samples are reported in this paper. Four samples were synthesized by the sol-gel method. The XRD analysis confirms the single phase and various parameters such as lattice constants (a and c), are calculated from the XRD data. Magnetic properties, such as specific saturation magnetization (M_s) and coercivity (H_c) are calculated from the hysteresis loops. Values of coercivity are found to increase up to the substitution level of $x = 0.0-0.2$ and then decreases continuously while that of saturation magnetization decrease continuously with increase in Ni-Cr concentration. The results show that microwave sintering requires about 75% less processing time than required by conventional method and still provides better magnetic properties.

Keyword: Ceramics; Magnetic materials; Surface properties; Magnetic properties; Saturation magnetization; Coercivity