

Effect of microwave sintering on microstructural and magnetic properties of strontium hexaferrite using sol-gel technique

ABSTRACT

The sol-gel method is used to prepared hexaferrite using d-Fructose as a fuel. The effect of sintering temperature on the microstructure of SrFe₁₂O₁₉ ceramics is analyzed. The observed XRD results indicate a well-formed crystalline phase of dense hexagonal SrFe₁₂O₁₉ ceramics. From this analysis, no secondary phases are identified. The microstructure of the sintered single phase M-type ferrites ceramics displays a hexagonal-platelet like morphology. Sintering temperature can markedly affect the grains in sintered ferrite. The sintered product is shown to be dense microstructure with relatively small grains. The maximum sintered density 95 % was obtained at lower temperature of 1,150 °C. In addition, saturation magnetization (50.43 emu/g) and the coercivity (H_c) 5,594.53 Gauss were observed.

Keyword: Microwave sintering; Strontium hexaferrite; Sol-gel technique