



Investigation of Structural, Thermal and Magnetic properties of Strontium substituted Barium Hexaferrite Synthesized via co-precipitation Method

S.Vadivelan*, N.VictorJaya

Department of physics, Anna University, Chennai-25, India

Abstract: In this paper, the strontium doped barium hexaferrite ($\text{BaSr}_x\text{Fe}_{12-x}\text{O}_{19}$) is synthesized by co-precipitated technique and involved the sintering process (1000°C up to 5hrs). After that the properties of these prepared samples are analyzed using various characterizations. The barium hexaferrite is mostly used in recording devices as well as permanent magnetic materials, because it exhibits perfect magnetic properties. The pure and strontium doped ($X=1\%$, 3% , 5% and 7%) barium hexaferrite were obtained from the technique. The x-rd peaks were indexed as a primitive hexagonal cell with the refined lattice parameter values of $a=b=5.865 \text{ \AA}$, and $c=23.099 \text{ \AA}$. From the lattice parameter values the structure of this compound is hexagonal. TGA/DTA is the studies to analysis the degradation mechanisms, reaction kinetics, determination of organic content and determination of inorganic (e.g. ash) content in a sample around 850°C and transformation of residuals at the around temperature 585°C . From the FT-IR, the functional groups and vibration modes are identified. SEM image is confirmed the size of the particles of the sample. From VSM characterization, the magnetic saturation (M_s) Value is increasing from $10.9\text{-}33.9\text{emu/g}$ with increasing doped percentage of strontium and magnetic remanenc (M_r) increased from $3.98\text{-}24.95 \text{ emu/g}$ with increasing doped percentage of strontium. H_c value of pure and doped barium hexaferrite also calculated and summarized in the table.

Keywords: co-precipitation, barium hexaferrite, saturation magnetization, magnetic remanence.

S.Vadivelan *et al* /Int.J. ChemTech Res. 2015,8(12),pp 404-410.
