SYNTHESIS AND CHARACTERIZATION OF NANO $La_{0.6}Pb_{0.4-x}Ca_xMnO3$ ($0.005 \leq x \leq 0.015$) PEROVSKITEMAGNATITE MATERIALS

G. K. SIVASANKARAYADAV[1], K. SAKTHIPANDI[2], K. THYAGARAJAN[3] & V. RAJENDRAN[4]

[1,3]Department of Physics, JNTUA College of Engineering, Pulivendula, Andhra Pradesh, India

[2,4]Centre for Nano Science and Technology, K. S. Rangasamy College of Technology, Tiruchengode, Tamil Nadu, India

ABSTRACT

Due to the versatile applications of perovskite manganite materials in fuel cells and sensors, research on two divalent doped perovskite magnetite materials are encouraging due to its interesting structural, magnetic and electrical properties. An effort has made to synthesis and characterization of nano $La_{0.6}Pb_{0.4-x}Ca_xMnO3$ ($0.005 \leq x \leq 0.015$) perovskite magnetic materials. The above perovskite have been prepared in bulk and nanoscale by using solid state and sonochemical reaction methods respectively. The prepared samples were characterised by Fourier transform infrared spectroscopy, X-ray diffraction, scanning electron microscope, Energy Dispersive X-Ray Microanalysis and Transmission electron microscopy structural investigations presented. The observed XRD results indicate that the prepared bulk and nano samples are in the rhombohedral crystal structure. The measurement of density of prepared bulk and nano samples were also carried out. The estimated particle size of bulk and nano perovskites is 352 nm and 90 nm respectively.

KEYWORDS: Perovskites, Solid State Reaction, Sonochemical Reactor, Rhombohedral