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Magnetic and Mössbauer studies of low temperature crystallined small size barium hexa ferrite nanoparticles

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Abstract : Barium Hexa ferrite nanoparticles were synthesized using chemical based citrate precursor method. The Citrate precursor was annealed at temperatures 700°C, 750°C and 800°C in a muffle furnace that lead to ferrite powder after crushing. The powder samples were characterized using X-ray diffraction (XRD), Vibrating sample magnetometer (VSM), Scanning electron microscopy (SEM) and Mössbauer spectroscopy. The average particle size was observed 51nm, 89 nm and 44nm respectively for the above mentioned samples prepared at

different annealing temperatures. The largest coercivity 4060 Oe was observed for sample annealed at 750°C. All the magnetic parameters were found to increase with annealing temperature upto 750°C and again decreased at 800°C. Mössbauer studies show that samples are in single phase with different magnetic characteristic i.e. magnetically coupled phase.

Key words: Hexa-ferrite, Nanoparticles, Low temperature, Mössbauer & Magnetic studies.