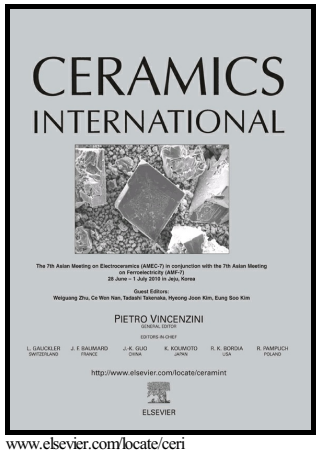

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Morphological and magnetic properties of $BaFe_{12}O_{19}$ nanoferrite: A promising microwave absorbing material

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Abstract

In this work, ultrapure hexagonal $BaFe_{12}O_{19}$ nanoferrite was synthesized by a facile co-precipitation method. Formation of single phase was analyzed by using wide angle X-ray diffraction. Crystallite size was found to increase from 50 nm to 78 nm when annealing temperature increased from 800 °C to 1000 °C, respectively. Ferrimagnetic behavior with moderate value of saturation magnetization and coercivity were studied at room temperature with the help of vibrating sample magnetometer (VSM). The electromagnetic radiation (EMR) absorption properties were studied in the frequency range of 2 to 18 GHz by using Vector Network analyzer (VNA). The maximum EMR absorption of -26.52 dB was observed at a frequency of 5.79 GHz. The FTIR spectra confirm tetrahedral and octahedral sites in $BaFe_{12}O_{19}$ structure. The surface morphology was analyzed by scanning electron microscopy (SEM), which reveals that the particles are agglomerated into irregular shapes. Particle size

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