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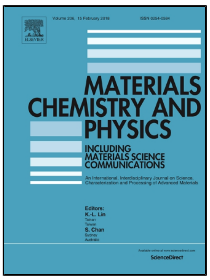

Microwave absorption properties of hexagonal barium doped @cip composite in wide band

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Microwave Absorption Properties of Hexagonal Barium Doped @CIP Composite in Wide Band

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ABSTRACT

M-type (BaM) hexagonal ferrite with chemical composition $Ba_{1.0}Mn_{0.5}Co_{0.5}Ti_{1.0}Fe_{10}O_{19}$ synthesized by solid state reaction. The XRD Pattern of BaM confirms the formation of hexagonal ferrite without any other impurity phases. The particle size and surface morphology has been analyzed by SEM characterization, which reveals the hexagonal morphology of $Ba_{1.0}Mn_{0.5}Co_{0.5}Ti_{1.0}Fe_{10}O_{19}$, with average size of 10 micron. The XRD pattern and SEM images of purchased Carbonyl Iron Powder (CIP) shows single phase of CIP with average size of 5 micron with spherical morphology.The XRD Pattern of BaM@CIP reveals the formation of composite, in which both phases are coexistant with CIP particles are connected with hexagonal particles of BaM to enhance the interfacial polarization due to accumulation of charges and improve the absorption of EM waves. The magnetic properties of all samples are studied at room temperature by Vibrating Sample Magnetometer (VSM), the M-H loop of composite sample shows increase in coercivity due to exchange spring effect produce in hard and soft magnetic composite materials. For RCS measurement, the pristine BaM ferrite and its composite with 50% (CIP) mixed with a suitable ratio of epoxy and hardener, applying on a metallic surface. The Reflection loss results of composite BaM@CIP shows enhancement in widening the band width (7.75-12.5 G Hz) at a minimum thickness of 1.2 mm.

Key words: Radar absorbing materials (RAM), Ferrite, Carbonyl Iron powder (CIP), RCS reduction.

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