

Abstract Submitted  
for the MAR13 Meeting of  
The American Physical Society

**Microwave absorption properties of  $\text{BaGd}_x\text{Fe}_{12-x}\text{O}_{19}$  nanoparticles synthesized by wet milling process**<sup>1</sup> MEHMET BURAK KAYNAR, SADAN OZCAN, SNTG Lab. Physics Engineering Dept. Hacettepe University Turkey, S. ISMAT SHAH, Department of Materials Science and Engineering, University of Delaware, Newark, DE 19716, United States — It is a big demand to have a wide band, easy to synthesize microwave absorption materials with a high absorption ratio according to their weight. As a solution, nanoparticles are used for the couple of years because of their tunable frequencies by just changing their particle size. Most interesting nano structures for this objective are ferrites. In this work as a microwave absorber,  $\text{BaFe}_{12}\text{O}_{19}$  and  $\text{BaGd}_2\text{Fe}_{10}\text{O}_{19}$  nanoparticles with different particles size are synthesized by the wet milling process. Their crystal structure analyzed by XRD, mean particle sizes were calculated from XRD patterns using rietveld analysis and from TEM images. Magnetic properties are analyzed by using Quantum design VSM. Microwave absorption properties are measured by using coaxial transmission method with an Agilent E5071 VNA. With the change of the last milling time from 0 to 20-hour crystalline sizes are changed from 48 nm to 13 nm. Decrease of particle size give rise to a decrease at coercivity and saturation magnetization of the samples. Change at the hysteresis loops gives a clue to the change of the microwave absorption frequency which is directly observed from the microwave measurements.

<sup>1</sup>Supported by TUBITAK-BIDEB 2214-Abroad Research Scholarship program.

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Date submitted: 04 Dec 2012

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