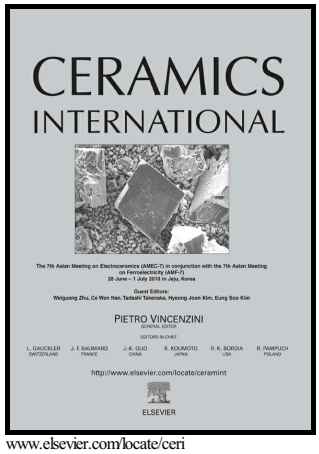

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PII: S0272-8842(17)30045-7
DOI: http://dx.doi.org/10.1016/j.ceramint.2017.01.033
Reference: CERI14495

To appear in: *Ceramics International*

Received date: 13 November 2016
Revised date: 5 January 2017
Accepted date: 7 January 2017

Cite this article as: Jian-Ping Zhou, Long-Liang An, Xi Yao, Nan-Nan Jiang Guo-Guang Yao, Xiao-Ming Chen, Ke-Xin Jin and Jian-Hong Peng, Structural interfacial, magnetic and dielectric properties of (1-x $(Mg_{0.95}Zn_{0.05})_2(Ti_{0.8}Sn_{0.2})O_4$@x$Ni_{0.4}Zn_{0.6}Fe_2O_4$ composite at high frequency *Ceramics International,* http://dx.doi.org/10.1016/j.ceramint.2017.01.033

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Abstract: $(Mg_{0.95}Zn_{0.05})_2(Ti_{0.8}Sn_{0.2})O_4$ powder was synthesized by a solid state reaction. Then, $Ni_{0.4}Zn_{0.6}Fe_2O_4$ was grown on the $(Mg_{0.95}Zn_{0.05})(Ti_{0.8}Sn_{0.2})O_4$ particles in a hydrothermal environment to form a core-shell structure. $(1-x)(Mg_{0.95}Zn_{0.05})_2(Ti_{0.8}Sn_{0.2})O_4@xNi_{0.4}Zn_{0.6}Fe_2O_4$ composite ceramics were sintered at 1200 °C with these powders. XRD, SEM, TEM analyses indicated that high dense core-shell ceramics without any foreign phase were obtained. Different types of sharp interfaces were self-assembled owing to the minimization of direct elastic energy in the hydrothermal environment. The composites enjoy good magnetic and dielectric properties, especially, good microwave dielectric properties with high saturation magnetization when the ferrite content is 0.3 ~ 0.5. The results provided a powerful experimental basis for the sensor and transducer.

Key words: dielectric constant**,** permeability, hydrothermal method, solid state method, microwave

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