

Accepted Manuscript

Crystal structural, dielectrical properties and high temperature magnetic phase transition of $\text{Sm}_{1-x}\text{Ca}_x\text{FeO}_3$ ($x=0-0.3$)

G.L. Song, J. Su, S.K. Fang, J.S. Tong, X.R. Xu, F. Yang, N. Zhang, F.G. Chang



PII: S0925-8388(18)31643-8

DOI: [10.1016/j.jallcom.2018.04.309](https://doi.org/10.1016/j.jallcom.2018.04.309)

Reference: JALCOM 45947

To appear in: *Journal of Alloys and Compounds*

Received Date: 24 February 2018

Revised Date: 26 April 2018

Accepted Date: 27 April 2018

Please cite this article as: G.L. Song, J. Su, S.K. Fang, J.S. Tong, X.R. Xu, F. Yang, N. Zhang, F.G. Chang, Crystal structural, dielectrical properties and high temperature magnetic phase transition of $\text{Sm}_{1-x}\text{Ca}_x\text{FeO}_3$ ($x=0-0.3$), *Journal of Alloys and Compounds* (2018), doi: 10.1016/j.jallcom.2018.04.309.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Crystal structural, dielectrical properties and high temperature

magnetic phase transition of $\text{Sm}_{1-x}\text{Ca}_x\text{FeO}_3$ ($x=0-0.3$)

G. L. Song*, J. Su, S. K. Fang, J. S. Tong, X. R. Xu, F. Yang, N. Zhang, F.G Chang

(Henan Key laboratory of Photovoltaic Materials, College of Physics and Materials Science,
Henan Normal University, Xinxiang 453007, China)

Abstract: In the present study, crystal structural, dielectric, ferromagnetic properties and high temperature magnetic phase transition of $\text{Sm}_{1-x}\text{Ca}_x\text{FeO}_3$ ($x=0-0.3$) by the conventional solid-state reaction method were investigated. The crystalline structure, the microstructure, the dielectric property of the $\text{Sm}_{1-x}\text{Ca}_x\text{FeO}_3$ samples was characterized by x-ray diffraction (XRD) and field emissions scanning electron microscopy (FESEM). The dielectric property measurement was performed by a precision impedance analyzer with the frequency range from 40 to 110MHz. The coexistence of $\text{Fe}^{3+/2+}$ ions in $\text{Sm}_{1-x}\text{Ca}_x\text{FeO}_3$ samples was investigated with X-ray photoelectron spectroscopy (XPS). The magnetic property of $\text{Sm}_{1-x}\text{Ca}_x\text{FeO}_3$ was measured with Physical Property Measurement System (PPMS). The result shows that all the peaks for $\text{Sm}_{1-x}\text{Ca}_x\text{FeO}_3$ samples can be indexed according to the crystal structure of pure SmFeO_3 and has a fine crystal structure by XRD. The SEM images indicate that Ca^{2+} doping significantly increases the grain sizes of SmFeO_3 ceramic. The average grain sizes of $\text{Sm}_{1-x}\text{Ca}_x\text{FeO}_3$ samples range from 0.5 to $2\mu\text{m}$ with Ca^{2+} doping. ϵ_r of $\text{Sm}_{1-x}\text{Ca}_x\text{FeO}_3$ measured at 1kHz is about 5, 3 and 2.6 times greater than that of SmFeO_3 , respectively, and the dielectric loss increases by an order of magnitude. The increase of ϵ_r is mainly caused by the interaction between the dipole and the space charge orientation polarization. Magnetic measurements show that the M-H of $\text{Sm}_{1-x}\text{Ca}_x\text{FeO}_3$ samples exhibit saturated magnetic hysteresis loops with the increase of Ca^{2+} , and the M_r of $\text{Sm}_{1-x}\text{Ca}_x\text{FeO}_3$ ($x=0-0.3$) is 20, 31, and 68 times of that of SmFeO_3 , respectively, suggesting the weakly

Download English Version:

<https://daneshyari.com/en/article/7991201>

Download Persian Version:

<https://daneshyari.com/article/7991201>

[Daneshyari.com](https://daneshyari.com)