



Relaxation behaviors of $\text{Bi}_{0.9}\text{La}_{0.1}\text{Fe}_{0.98}\text{Mg}_{0.02}\text{O}_3$ (BLFM)

by Miss Ke Qing Qing

Date: 27th August 2009 (Thursday)
Time: 12:30pm to 1:00pm
Venue: EA-02-11 (Executive Seminar Room)

Abstract

Among the multiferroic materials studied, BiFeO_3 (BFO) receives the extraordinary interests, owing to its high ferroelectric ($T_C \sim 1103$ K) and antiferromagnetic ($T_N \sim 643$ K) transition temperatures. Currently, a large polarization of $60 \mu\text{C}/\text{cm}^2$ and electrical control of antiferromagnetic domains have been successfully observed in epitaxial BFO thin films promising it a prospective candidate for lead-free ferroelectric, piezoelectric and magnetoelectric coupling devices. Single-phase multiferroic $\text{BiLa}_{0.1}\text{Fe}_{0.98}\text{Mg}_{0.02}\text{O}_3$ (BLFM) film was fabricated using Supttering method. Dielectric response of $\text{BiLa}_{0.1}\text{Fe}_{0.98}\text{Mg}_{0.02}\text{O}_3$ (BLFM) film was investigated over a wide range of temperature and frequency. Our results reveal that Two obvious peaks can be obtained in the temperature range of 313 K to 473K, and with increasing temperature, the peaks move to the high frequency field which obviously show that the relaxation process is a kind of typical thermal activated process. The peak at low frequency (10^2 - 10^3 Hz) is due to the diffusion of doubly-ionized oxygen vacancies. The one at high frequency (10^4 - 10^5 Hz) can be ascribed to hopping electrons between Fe^{2+} and Fe^{3+} . For the scaling behavior; it is shown that the distribution functions for relaxation times of both peaks are nearly temperature independent.

Miss Ke Qing Qing Speaker

Miss Ke Qing Qing received her bachelor and master degree in the Material Science Department at Northwestern Polytechnical University in China 2005 and 2008. She is currently pursuing her PHD in the Department of Materials Science and Engineering, NUS. Her recent research interests focus on the ferroelectric thin film and under the supervision of Professor John Wang

Dr Xue Jun Min Host

All are Welcome!