Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Electrical and Dielectric Properties of $ACu_3Ti_4O_{12}$ Compounds
JIANJUN LIU, CHUN-GANG DUAN, WAI-NING MEI, Department of Physics, University of Nebraska, Omaha, Nebraska 68182-0266, JOHN HARDY, Department of Physics and Center for Electro-Optics, University of Nebraska, Lincoln, Nebraska 68588-0111, ROBERT SMITH, Department of Chemistry, University of Nebraska, Omaha, Nebraska 68182-0109 — We studied frequency and temperature dependences of impedance and permittivity of several compounds in the system $ACu_3Ti_4O_{12}$ (A=Ca, $Bi_{2/3}$, $Y_{2/3}$, $La_{2/3}$) in the ranges of $10^{-1}\sim10^{6}$ Hz and -150$\sim$200 °C, respectively. We found all compounds investigated displayed similar electrical and dielectric properties, namely, they all have two electrical responses in the impedance formalism and a Debye-like peak in the permittivity formalism, besides, their dielectric constants are independent of frequency and temperature in a wide range. We explained the experimental results in terms of a two-layer model with conducting grains partitioned from each other by poorly conducting grain boundaries. We attributed the two electrical responses in the impedance formalism to the grain and grain boundary effects, respectively, while the Debye-like peak in the permittivity formalism to a Maxwell-Wagner relaxation.

Wai-Ning Mei
Department of Physics, University of Nebraska
Omaha, Nebraska 68182-0266

Date submitted: 20 Mar 2013 Electronic form version 1.4