
Contribution ID: **166** Contribution code: **S2 Condensed Matter Physics** Type: **Poster Presentation**

# Giant Dielectric Properties of Ca[$Cu_{3-x}Ti_x$]$Ti_4O_{12}$ Ceramics

Ca[$Cu_{3-x}Ti_x$]$Ti_4O_{12}$ (x= 0.00, 0.03, 0.09, 0.15 and 0.30) ceramics were prepared using a solid-state reaction method. The mixed oxides were calcined at 800 ℃ for 5 h and then sintered at 1090 ℃ for 5 h. The effects of Ti doping ions on the microstructure and dielectric properties were studied. The results indicated that the Ca[$Cu_{3-x}Ti_x$]$Ti_4O_{12}$ showed improved dielectric properties, including giant permittivity (ε'~$10^4$) and low loss tangent (tanδ ~ 0.13-0.01) at room temperature over the frequency range from 40 Hz to 10 MHz. Notably, the Ca[$Cu_{3-x}Ti_x$]$Ti_4O_{12}$ with x=30% showed improved dielectric properties with ε'~ 5.91x$10^4$ and low tanδ ~ 0.07 at room temperature and 1 kHz. Impedance spectroscopy was used to analyze the electrical properties of the grains and grain boundaries. The giant dielectric properties were explained by an internal boundary layer capacitance (IBLC) effect.

**Authors:** CHANLEK, Narong (Suranaree University of Technology (TH)); THONGBAI, Prasit (Khon Kaen University); WONGTONGDEE, Piyanud

**Presenter:** WONGTONGDEE, Piyanud

**Session Classification:** Poster: S2 Condensed Matter Physics

**Track Classification:** Condensed Matter Physics