

# **Thermal expansion coefficient and dielectric properties of non-stoichiometric cordierite compositions with excess MgO mole ratio synthesized from mainly kaolin and talc by the glass crystallization method**

## **Abstract**

$\alpha$ -Cordierite phase in non-stoichiometric cordierite formulations was synthesized using mainly kaolin and talc, without sintering aids, via the glass crystallization route. MgO mole ratios in the formulations were varied from 2.0 to 4.0, with fixed mole ratios of alumina and silica, to study the effect of MgO concentration on the coefficient of thermal expansion coefficient (CTE) and dielectric properties. The CTE values decreased from  $2.5 \times 10^{-6}$  to  $-2 \times 10^{-6}/\text{K}$  for samples with MgO mole ratios varied from 2.0 to 4.0, respectively. Dielectric permittivity and dielectric loss were measured from 1 MHz to 1.8 GHz for all formulations and showed the average value of  $\epsilon' = 5-6.5$  and  $\tan \delta = 10^{-2}$ .