

## High temperature dielectric properties of cubic bismuth zinc tantalate.

### ABSTRACT

Electrical properties of the parent phase in the  $\text{Bi}_2\text{O}_3\text{-ZnO-Ta}_2\text{O}_5$  ternary system, cubic  $\text{Bi}_{1.5}\text{ZnTa}_{1.5}\text{O}_7$  ( $\alpha$ -BZT), P, are investigated using impedance spectroscopy. P has permittivity ( $\epsilon'$ ) of 58, dielectric loss ( $\tan \delta$ ) of 0.0023 at 30 °C and 1 MHz; temperature coefficient of capacitance (TCC) of  $-156$  ppm/°C in the range of 30–300 °C at 1 MHz. A high degree of dispersion in the permittivity at low frequencies ( $<1$  kHz) and temperatures above 500 °C is apparent. Dielectric losses exhibit non-frequency dependence at low temperatures presenting an increase at temperatures above 500 °C. A decrease of the loss occurs with increasing frequency.

**Keyword:** Pyrochlore; Permittivity; Dielectric loss; Temperature coefficient of capacitance.