

## Bismuth zinc niobate pyrochlore, a relaxor-like non-ferroelectric

### Abstract

Fixed frequency plots of  $\epsilon$  and  $\tan \delta$  versus temperature for  $(\text{Bi}_{1.5}\text{Zn}_{0.5})(\text{Zn}_{0.5}\text{Nb}_{1.5})\text{O}_7$  (BZN) ceramics with the pyrochlore structure show relaxor-like response below  $\sim 180$  K with frequency-independent permittivity of  $\sim 130$  above  $\sim 180$  K and over the frequency range of  $10^3$ - $10^6$  Hz. Impedance data in the range, 10-180 K fit an equivalent circuit derived from the classic dielectric relaxation circuit in which the relaxation resistance is replaced by a constant phase element (CPE). Temperature dependence of the circuit parameters shows that BZN is not ferroelectric; the CPE, which is responsible for the relaxor-like behavior, gradually changes from primarily capacitive to primarily resistive with increasing temperature.