

A STUDY ON ELECTRICAL PROPERTIES OF YTTERBIUM OXIDE DOPED $\text{Ba}(\text{Zr}_{0.02}\text{Ti}_{0.98})\text{O}_3$ CERAMICS

T.S. THEJAS^{1,2}, B. SAHOO^{1,2} AND P.K. PANDA^{*1,2}

Ytterbium oxide (Yb_2O_3) (0.02-0.06 wt. %) doped Ba ($\text{Zr}_{0.02}\text{Ti}_{0.98}$) O_3 were synthesized by mixed oxide route. The powders were calcined at 1100 °C for 4 h, de-agglomerated, granulated pressed into pellets, and sintered at 1450 °C for 2 h. The samples were electrode with silver-palladium paste, cured at 1000 °C for 1 h, poled and characterized. Maximum piezoelectric coefficient (d_{33}) achieved was 345 pC/N and relative dielectric constant ($K=14051.2$) obtained at Curie temperature (T_c) and 100 Hz frequency for 0.02 wt.% Yb_2O_3 doping. This sample exhibits a higher positive strain of 0.46% at an electric field of 20.94 kV/cm could be a suitable lead-free piezo material for high strain and actuation application.

Keywords: *Yb_2O_3 -doped BZT; lead-free piezoceramics; piezoelectric charge coefficient; Curie temperature.*
