

Bi₂O₃첨가에 따른 무연 NKNLTS계 세라믹스의 압전특성

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Piezoelectric properties of lead-free NKNLTS ceramics with Bi₂O₃ addition

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Abstract : Lead-free Piezoelectric [Li_{0.04}(Na_{0.44}K_{0.56})](Nb_{0.88}Ta_{0.1}Sb_{0.02}) (abbreviated as NKNLTS) has been synthesized by conventional mixed oxide method traditional ceramics process without cold-isostatic pressing. Effect of Bi₂O₃ addition on NKNLTS ceramics was investigated. Piezoelectric properties of the ceramic were varied with the amount of Bi₂O₃ addition and showed the maximum K_p value at 0.4wt% Bi₂O₃ addition. The results show that the optimum poling condition for NKNLTS ceramics of 3.5kV/mm, poling temperature of 120℃ and poling time of 30min. At the sintering temperature of 1100℃ and the calcination temperature 800℃, the optimal values of density=4.7g/cm³, K_p=0.44, ε_r=1309 were obtained.

Consequently, lead free piezoelectric ceramics with the excellent piezoelectric could be fabricated using a conventional mixed oxide process and the optimal manufacturing condition of those was obtained.

Key Words : lead-free piezoelectric ceramics, calcination, sintering temperature