

$(\text{Na}_x\text{K}_{0.94-x}\text{Li}_{0.06})\text{NbO}_3$ 세라믹스의 압전 및 유전 특성

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Piezoelectric Properties of Lead-Free $(\text{Na}_x\text{K}_{0.94-x}\text{Li}_{0.06})\text{NbO}_3$ Ceramics

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Abstract : As a candidate for lead-free piezoelectric materials, dense $(\text{Na}_x\text{K}_{0.94-x}\text{Li}_{0.06})\text{NbO}_3$ ceramics were developed by conventional sintering process. Sintering temperature was lowered by adding 1 mol% Li_2O as a sintering aid. The electrical properties of $(\text{Na}_x\text{K}_{0.94-x}\text{Li}_{0.06})\text{NbO}_3$ ceramics were investigated as a function of Na/K ratio. When the sample sintered at 950 °C for 4 h with the compositions of morphotropic phase boundary, $0.47 < x < 0.51$, electro-mechanical coupling factor (k_p) and piezoelectric coefficient (d_{33}) were found to reach the highest values of 0.42 and 190 pC/N, respectively. These excellent piezoelectric and electro-mechanical properties indicate that this system is potentially good candidate for lead-free material for a wide range of electro-mechanical transducer applications.

Key Words : piezoelectric, ceramics, lead-free, sodium-potassium niobate