

Low-Temperature Sintering and Piezoelectric Properties of (Na_{0.5}K_{0.5})NbO₃ Lead-Free Piezoelectric Ceramics

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(Na_{0.5}K_{0.5})NbO₃ (NKN) ceramic with 1.5 mol% CuO added (NKNC) was well sintered even at a low temperature of 900°C with the addition of ZnO. Most of the ZnO reacted with the CuO and formed the liquid phase that assisted the densification of the specimens at 900°C. A few Zn²⁺ ions entered the matrix of the specimens and increased the coercive field (E_c) and Q_m values of the specimens. High-piezoelectric properties of $k_p=0.37$, $Q_m=755$, and $\epsilon_3^T/\epsilon_0=327$ were obtained from the NKNC ceramics containing 1.0 mol% ZnO sintered at 900°C for 2 h.