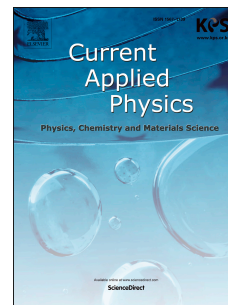


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Study of temperature-induced structural evolution in $(\text{Na}_{0.5}\text{Bi}_{0.5})\text{TiO}_3$ - $(\text{K}_{0.5}\text{Bi}_{0.5})\text{TiO}_3$ - $(\text{K}_{0.5}\text{Na}_{0.5})\text{NbO}_3$ lead-free ceramics

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**Study of temperature-induced structural evolution in
(Na_{0.5}Bi_{0.5})TiO₃-(K_{0.5}Bi_{0.5})TiO₃-(K_{0.5}Na_{0.5})NbO₃ lead-free
ceramics**

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Abstract

In this work, the temperature-induced structural evolution in 0.79(Na_{0.5}Bi_{0.5})TiO₃-0.2(K_{0.5}Bi_{0.5})TiO₃-0.01(K_{0.5}Na_{0.5})NbO₃ (NKBNT) lead-free ceramics was investigated by Raman microscopic spectroscopy combined with electrical macroscopic measurements. The NKBNT ceramics possess the local structure with the coexisted rhombohedral $R3c$ and tetragonal $P4bm$ polar-nano-regions (PNRs). The $R3c$ and $P4bm$ PNRs coexist in a wide temperature range, then the local structure transforms to the $P4bm$ PNRs around the temperature of dielectric maximum (T_m) evidenced by the doublet splitting of Ti-O modes (peak B) and oxygen octahedral vibrational modes (peak C). The discontinuous changes of wavenumber and line-width of peak B_2 and peak C_3 as well as the dielectric local

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