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Abstract
Recently, all the tendencies of the investigations for ceramic materials are lead-free and low pollution. The lead-free ferroelectric ceramics are mainly focused on Na0.5Bi0.5TiO3 (NBT), and comparing with the previous reports of NBT, the reports of KBT were fewer than that of NBT in the past. Moreover, NBT are always doped K0.5Bi0.5TiO3 and BaTiO3 to improve the dielectric properties.
The merits of the lead-free ferroelectric ceramics K0.5Bi0.5TiO3 are low polarization filed and high remnant polarization, and it could be applied widely in the piezoelectric filters, resonators, and micro-electric-mechanical system (MEMS). In this dissertation, for different sintering temperatures, the variations of dielectric characteristic of K0.5Bi0.5TiO3+BaTiO3 due to different content of Bi2O3 doping are investigated. According to the stoichiometry of the composition K0.5Bi0.5TiO3+BaTiO3, high quality K2CO3, Bi2O3, BaCO3, and TiO2 powders are mixed together to form K0.5Bi0.5TiO3 and BaTiO3 by the conventional solid-state reaction, respectively. X-Ray diffraction (XRD) was used to analysis the composition, and environment electronic microscope (ESEM) was used to observe the surface microstructure, and finally, the dielectric properties are measured by the impedance analyzer (HP4294) after the Ag-Pd paste are painted and fired at 700℃/30min in the air. From the results, as the content of Bi2O3 increased, the sintering temperature and Curie temperature decreased but the dielectric constant increased a little. And for all of the compositions, the increasing of the content of K0.5Bi0.5TiO3 would cause to the increasing of the dielectric constant and Curie temperature.
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