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Conduction Mechanisms of Y, Cu, Li, and $Pb(Zn_{1/3}Nb_{2/3})O_3$ Compound-doped $0.2[Pb(Mg_{1/3}Nb_{2/3})O_3]-0.8[Pb(Zr_{0.475}Ti_{0.525})O_3]$ Pyroelectric Ceramics

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Compositions close to $PbZrO_3$ in the $PbZrO_3$-$PbTiO_3$-$PbMg_{1/3}Nb_{2/3}O_3$ system have been shown to possess excellent pyroelectric properties The pyroelectric, dielectric and dc conductivity properties of Y, Cu, Li, and $Pb(Zn_{1/3}Nb_{2/3})O_3$ (PZN) compound doped $0.2[Pb(Mg_{1/3}Nb_{2/3})O_3]$-$0.8[Pb(Zr_{0.475}Ti_{0.525})O_3]$ (PMN-PZT) ceramics have been investigated The behaviors of the electrical resistivity according to the doping elements and compound are shown to produce a very different pyroelectric and conduction mechanism This implied a similar conduction mechanism, probably hopping between non-ionised dopant ion sites It is demonstrated that this relationship can be used as a predictive tool for electrical conductivity control in these systems

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Effects of Oxygen Flow Rate on the Crystallographic Orientation of NiO Thin Films Deposited by RF Magnetron Sputtering

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Epitaxial nickel oxide (NiO) thin films can be used as buffer layers on which to deposit other oriented oxide films, such as c-axis-oriented perovskite-type ferromagnetic films and superconducting films, because of their chemical stability and the similarity in symmetry of oxygen ion lattice and lattice constants between the NiO films and the oriented oxide films For using the NiO films as the buffer layers, controlling the crystallographic orientation and surface roughness of thefilms are very important

In this study, (100)- and (111)-oriented NiO thin films were prepared on Si(100) substrates at room temperature by RF magnetron sputtering using a NiO target. The relationship between sputtering gases, and preferred orientation and surface morphology of the NiO films was investigated. Highly crystalline NiO film with (100) orientation was obtained when it deposited in pure Ar gas. For NiO films deposited in pure O_2 gas, on the other hand, the orientation of the films changed from (100) to (111) and their deposition rate decreased The origin of the preferred orientation of the films was discussed NiO films with both (100) and (111) orientation had columnar structure, and showed different surface morphologies and roughnesses with the type of sputtering gases This study was supported by a Korea research foundation grant (KRF-2002-005-D00012)