Synthesis and Characterzation of Zinc Titanate Doped with Magnesium

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Abstract

The zinc titanate doped with magnesium powders were performed by conventional solid state reaction technique using metal oxides. It is shown that they are semiconductor. The characteristics of zinc titanate samples were found to depend on the heating conditions and the amounts of additions. It revealed that the metal magnesium can replace the zinc ion and forms a solid solution in $ZnTiO_3$ phase. The $(Zn,Mg)TiO_3$ shows a minimum electrical resistivity at the sintering temperature of 900℃ and decreases with increasing amounts of magnesium. It represents the V-type resistivity-temperature characteristic and possesses the typical PTCR characteristics. Furthermore, the dielectric constant increased with increasing sintering temperature and decreased with increasing the amounts of magnesium. It also shows a maximum Q factor at about 8 GHz for $(Zn_{0.9}, Mg_{0.1})TiO_3$ sintered at 900℃.