

The improvements of the dielectric performance of SmCrO_3 by Zn doping

Abstract

The ceramic composites of $\text{Sm}(1-x)\text{Zn}_x\text{CrO}_3$ ($x=0,0.05,0.1,0.2$) and $\text{SmZn}_y\text{Cr}(1-y)\text{O}_3$ ($y=0,0.05,0.1,0.2$) were synthesized by solid state reaction. X-ray diffraction (XRD) patterns for all the samples almost match with standard pattern of SmCrO_3 . The complex dielectric properties of the ceramic samples were investigated as a function of temperature (77 K~350 K) and frequency (0.5 kHz~1000 kHz) separately. In all these ceramic samples, the dielectric constant (ϵ') increase with increasing temperature, in which two relaxation processes are found. while the dielectric loss($\tan\delta$) undulate with temperature and show two peaks corresponding to the two relaxaton. Obviously, the values of dielectric constant of Zn-doped samples are larger than that of the pristine SmCrO_3 , meanwhile the values of dielectric loss are smaller than that of the pristines at room temperature and high frequency region. Impedance analysis reveals that the electrical relaxation processes can be attributed to the combined actions of grain and grain boundary effects, which lead to these improvements in Zn-doped SmCrO_3 .

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Biography

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