The Sintering and Microwave Dielectric Characteristics of the $(Ba_{1-x}Sr_x)Sm_2Ti_4O_{12}$ Composite (0□x□0.5)

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The sintering and microwave dielectric characteristics of $(Ba_{1-x}Sr_x)Sm_2Ti_4O_{12}$ compositions (0□x□0.5) are developed in the study. As the SrO content increases, the lattice constants (a, b, and c axis) first increase and then decrease. Sintered at 1350^{o}C, only the $BaSm_2Ti_4O_{12}$ phase is exist in the BaO-Sm_2O_3-$4TiO_2$ composite, but the $0.9BaO$-$0.1SrO$-Sm_2O_3- $4TiO_2$, $0.75BaO$-$0.25SrO$-Sm_2O_3- $4TiO_2$, and $0.5BaO$-$0.5SrO$-Sm_2O_3-$4TiO_2$ compositions reveal two phases: $Sm_2Ti_2O_7$ and $(Ba,Sr)Sm_2Ti_4O_{12}$ coexist. The microwave dielectric characteristics of $(Ba_{1-x}Sr_x)Sm_2Ti_4O_{12}$ ceramics are influenced by SrO content. In the $(Ba_{1-x}Sr_x)Sm_2Ti_4O_{12}$ compositions, the $(Ba_{0.9}Sr_{0.1})Sm_2Ti_4O_{12}$ ceramic reveals the optimum microwave dielectric characteristics: ε_r=71.5, Q×f=8150 GHz, and τ_f=−2.83 ppm/^{o}C.

KEYWORDS: $(Ba_{1-x}Sr_x)Sm_2Ti_4O_{12}$, two phase, microwave dielectric characteristic