

BST 세라믹 저온소결에 Li_2CO_3 와 ZnBO 가 미치는 영향

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Effective of Li_2CO_3 and ZnBO for low temperature sintered $(\text{Ba}_{0.5},\text{Sr}_{0.5})\text{TiO}_3$ ceramics

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Abstract : The $(\text{Ba}_{0.5},\text{Sr}_{0.5})\text{TiO}_3$ ceramics, which added with low sintering materials Li_2CO_3 and ZnBO , was investigated for LTCC(low temperature co-fired ceramic) applications. To compare sintering temperature of $(\text{Ba}_{0.5},\text{Sr}_{0.5})\text{TiO}_3$ respectively, we added 1, 2, 3, 4, and 5wt% of Li_2CO_3 and ZnBO to $(\text{Ba}_{0.5},\text{Sr}_{0.5})\text{TiO}_3$. For confirming the sintering temperature, the respective specimens were sintered from 750°C to 1200°C by 50°C. The case of Li_2CO_3 greatly lowered the sintering temperature of $(\text{Ba}_{0.5},\text{Sr}_{0.5})\text{TiO}_3$ (1350°C) below 900°C. The addition of ZnBO improved the loss tangent of $(\text{Ba}_{0.5},\text{Sr}_{0.5})\text{TiO}_3$. The crystalline structure of Li_2CO_3 doped $(\text{Ba}_{0.5},\text{Sr}_{0.5})\text{TiO}_3$ and ZnBO doped $(\text{Ba}_{0.5},\text{Sr}_{0.5})\text{TiO}_3$ was analyzed with the X-ray diffraction (XRD) analysis. The dielectric permittivity and loss tangent of Li_2CO_3 doped BST and ZnBO doped BST were measured with the HP 4284A precision. From the electrical characterization, we respectively obtained the dielectric permittivity 1361, loss tangent 6.94×10^{-3} at Li_2CO_3 doped $(\text{Ba}_{0.5},\text{Sr}_{0.5})\text{TiO}_3$ (3wt%) and the dielectric constant 1180, loss tangent 3.70×10^{-3} at ZnBO doped $(\text{Ba}_{0.5},\text{Sr}_{0.5})\text{TiO}_3$ (5wt%).