

저온소결 $\text{Al}_2\text{O}_3\text{-TiO}_2$ 세라믹의 마이크로파 유전특성에 관한 연구

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Low Temperature sintering of $\text{Al}_2\text{O}_3\text{-TiO}_2$ ceramics

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Abstract : $\text{Al}_2\text{O}_3\text{-TiO}_2$ (AT)ceramics shows great promise as a dielectric material for millimeter-wave use. The sintering temperature of AT ceramics was approximately 1450°C and decreased to 900°C with the addition of $\text{BaCu}(\text{B}_2\text{O}_5)$ (BCB) ceramic powder. The presence of the liquid phase was responsible for the decrease of the sintering temperature. The liquid phase is considered to have a composition similar to the BaO-deficient BCB. The Q -value initially increased with the addition of BCB, but decreased considerably when a large amount of BCB was added, because of the presence of the liquid phase. Good microwave dielectric properties of $Q \times f = 16,200$ GHz, $\epsilon_r = 9$ and $\tau_f = -4$ ppm/ $^\circ\text{C}$ were obtained for the 20.0 mol% BCB-added AT ceramics sintered at 900°C for 2 h.

Key Words : Dielectric, $\text{Al}_2\text{O}_3\text{-TiO}_2$, LTCC, $Q \cdot f$, BCB