

# EFFECTS OF THE SINTERING CONDITIONS ON THE DIELECTRIC CHARACTERISTICS OF $0.97\text{BaTiO}_3 - 0.03\text{PbF}_2 - 0.03\text{LiF}$ CERAMICS

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The electronic industry is in expanding worldwide and the needs for dielectric ceramics become huger and huger. Among these materials,  $\text{ABO}_3$  perovskites are very attractive due to their various applications. In an earlier investigation we have studied the system  $(1-x)\text{BaTiO}_3 - x\text{PbF}_2 - x\text{LiF}$  at  $930^\circ\text{C}$ . In the present work we shall examine the effects of the sintering conditions such as the sintering temperature and the holding time on the dielectric properties of ceramics with initial composition  $0.97\text{BaTiO}_3 - 0.03\text{PbF}_2 - 0.03\text{LiF}$ . A mixture of 97mol. %  $\text{BaTiO}_3$ , 3mol.%  $\text{PbF}_2$  and 3mol. %  $\text{LiF}$  is wet-ground than cold-pressed to pellets. These disks are sintered in air atmosphere at 800, 900, 1000 or  $1100^\circ\text{C}$  during 1, 2 or 4 hours. XRD analyses are performed on powder samples. The microstructures are observed by SEM on fractured ceramics. Dielectric measurements are carried out as a function of temperature from  $-120^\circ\text{C}$  up to  $200^\circ\text{C}$  and in the frequency range  $50\text{Hz} \leq f \leq 40\text{MHz}$ . The triple substitution Ba – Pb, Ti – Li and O – F lowers simultaneously the Curie temperature ( $70^\circ\text{C} \leq \Delta T_C \leq 135^\circ\text{C}$ ) and the relaxation frequency ( $460\text{MHz} \leq \Delta f_r \leq 480\text{MHz}$ ) of pure  $\text{BaTiO}_3$ . The  $\epsilon'_r - T$  curves exhibit a profile compatible with the Z5U class of capacitors.