

INFLUENCE OF THE EUTECTIC COMPOSITION 1CaF₂-4LiF ON THE SINTERING AND THE DIELECTRIC PROPERTIES OF BaTiO₃

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High densified ceramics were prepared at low temperature ($t_{\text{sint.}} \leq 1000^\circ\text{C}$) using the eutectic composition 1CaF₂-4LiF (3-5 mol.%). The samples were studied by X-ray diffraction and scanning electron microscopy. Dielectric measurements were performed as a function of temperature ($150\text{ K} \leq T \leq 450\text{ K}$) and frequency ($50\text{ Hz} \leq f \leq 4.10^7\text{ Hz}$). The best dielectric performances were obtained from the starting mixture 1BaTiO₃ + 0.03CaF₂ + 0.12LiF sintered at 1000°C for 4 hours. The relative density reached 96 % and the Curie temperature was about 310 K for the corresponding ceramic. High values of the dielectric constant ($\epsilon_r' > 6000$) were observed at room temperature in the frequency range 10^2 - 3.10^5 Hz . A dielectric relaxation occurred in the temperature range investigated at frequencies much lower than in pure BaTiO₃: 7.10^6 Hz instead of 5.10^8 Hz at 300 K.