

# **Influence of seed particle addition on the microstructure and on the dielectric properties of $\text{Ba}_{0,77}\text{Ca}_{0,23}\text{TiO}_3$ ceramics**

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## **Abstract**

The solid state reaction method as well as addition of seed particles of  $\text{Ba}_{0,77}\text{Ca}_{0,23}\text{TiO}_3$  (BCT23) were used to prepare BCT23 ceramics. Appropriated amounts of  $\text{BaCO}_3$ ,  $\text{CaCO}_3$  and  $\text{TiO}_2$  were mixed for 96 h by ball milling in isopropyl alcohol. The powder was calcined at 1100 °C for 3 h and the phase formation was accompanied by XRD. It was verified the presence of the  $\text{BaTiO}_3$  (BT) and  $\text{CaTiO}_3$  (CT) phases in the powder. After calcinations, the powder was uniaxially pressed at 20 MPa with addition of BCT23 single crystal fiber pieces, which were used as seed particles. After pressing, the samples were sintered at 1300 °C for 3 h. A highly dense ceramic of up to 98% of the theoretical density and the BCT phase was obtained by sintering compacted powders at 1300 °C. The addition of BCT23 single crystal fiber pieces as seed particles influenced on the microstructure and on the dielectric properties of BCT ceramics. BCT23 ceramics prepared by this methodology show values of dielectric constant comparable the values obtained for BCT23 single crystal (5250 at 1 kHz).

*Keywords:* (Ba, Ca)  $\text{TiO}_3$ ; dielectric properties, seed particles