Electrical characteristics of $BaTiO_3$ ceramics and thick films prepared from soft chemistry powders

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It is known that the dielectric properties of $BaTiO_3$ ceramics strongly depend on the sintering ability of the starting powders and therefore of their morphological characteristics (size distribution, crystallite size, agglomeration state). Finally divided $BaTiO_3$ powders were synthesized by hydrothermal method : treatment at 150 °C and 250 °C for 7 hours of a mixture of $TiCl_3$ and $BaCl_2$ or TiO_2 and $BaCl_2$. Then the powders were spread in thick film using the doctor blade method or compacted in pellets by uniaxial pressing and finally sintered by heating in air. The sintering parameters were adjusted to optimise the density of the final materials. The microstructure, densities and dielectric constants of the ceramics and films have been determined and correlated to the powder quality.