

Electrical properties and microstructure of phase combination in BaTiO₃-based Ceramics

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Perovskite barium titanate (BaTiO₃) ceramics are widely used in electronics industries such as capacitors, sensors and actuators. BaTiO₃-based ceramics have good dielectric, ferroelectric and piezoelectric properties. BaTiO₃ powder was fabricated by mixed-oxide method via a vibro-milling technique. The pellets were then placed in a high purity alumina crucible in air and sintered at 1375 °C for 1, 2, 4 and 8h. X-ray diffraction technique was used to investigate phase formation of BaTiO₃ ceramics. Grain size was measured by scanning electron microscopy (SEM). The computer-controlled dielectric measurement system consisted of a high precision LCR-meter. Electric field induced polarization was measured by Sawyer-Tower circuit. In this work, the effect of phase combination in BaTiO₃-ceramics on electrical properties (dielectric and electric field induced polarization) and microstructure was investigated.

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