

The influence of vacuum pressure on the electrical properties of PbTiO_{3-x} ceramics

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Abstract: PbTiO_{3-x} ceramics were successfully prepared by the traditional solid state reaction method using different vacuum pressures during calcinations step and then sintered at 1150 °C/2h. The present study was focused on the influence of vacuum pressure variation on the electrical properties of PbTiO_{3-x} ceramics. The room temperature XRD patterns indicate the crystallization of the perovskite structure for all the ceramics. The dielectric permittivity is increasing with decreasing of vacuum pressure due to the increasing of oxygen vacancies with reaching the high vacuum. Resistivity decreased with temperature increasing which proves the semiconductor character of present PbTiO_{3-x} ceramics. The electrical characterization indicates that PbTiO_{3-x} ceramics prepared using three different vacuum pressures during calcinations step are suitable for room temperature applications in microelectronics.

Keywords : PbTiO_{3-x} ceramics, vacuum pressure, oxygen vacancies, Electrical properties, resistivity