ELECTROCERAMICS IX

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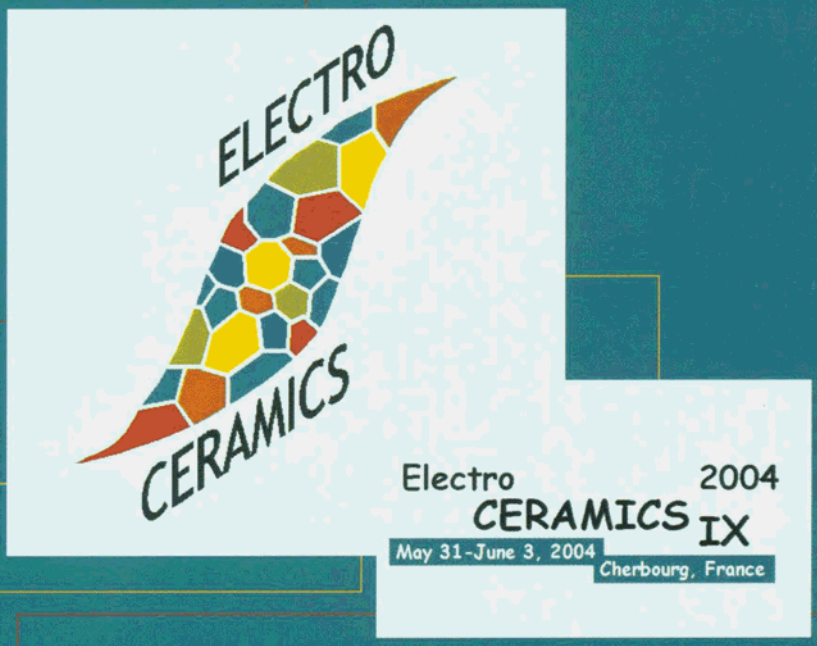

Programme & Abstracts

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Investigation of Barium Titanate Posistor Ceramics

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Abstract

INVESTIGATION OF BARIUM TITANATE POSISTOR CERAMICS
BY ESR METHOD
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Barium titanate ceramics doped by various ions is widely applied in modern technique. One of the unique properties of BaTiO3 ceramics is positive temperature coefficient of resistance (PTCR) effect, which strongly depends on type of impurity ions and their position in the crystal lattice. In this work we performed the study of impurity centers, electrical resistivity and microstructure of BaTiO3 ceramics doped with Nb, Ta, Mo or W ions in a wide range of concentrations. Electron spin resonance, X-ray diffraction and electron microscopy methods have been used for measurements. It was shown that grain size of BaTiO3 ceramics became smaller under Ta or Nb doping though the temperature region of the effect of positive temperature coefficient of resistivity remains practically unchanged. For exact identification of paramagnetic centers observed in ceramic samples, ESR studies of BaTiO3 single crystals were carry out as well. The observed correlation between ESR intensity and conductivity allowed us to assume an essential role of the revealed paramagnetic complexes in the appearance of semiconducting properties in BaTiO3 ceramics. The influence of the impurities on the PTCR effect observed in BaTiO3 ceramics is discussed.