

# Electrical Conductivity and Hysteresis Characteristic of BaTiO<sub>3</sub>-Based Sensors with Polymethyl metacrylate (PMMA) Pore Former

Burcu Ertuğ\*

Department of Metallurgical and Materials Engineering, Istanbul Technical University,  
34469 Maslak, Istanbul, Turkey

**Key words:** Barium titanate, sintering, microstructure, PMMA, electrical conductivity, hysteresis

(Received May 29, 2012; accepted October 9, 2012)

Porous barium titanate ceramics were fabricated by the addition of polymethyl metacrylate (PMMA). The effects of PMMA on the microstructure and electrical conductivity of the porous ceramics were investigated. According to thermal analysis, the endothermic reaction occurred at 832.7°C, which corresponds to the orthorhombic-hexagonal transformation of barium carbonate, and the formation of barium titanate occurred at 1098.6°C. It was found that the porosity increased and the grain size decreased with increasing PMMA mass%. The crystalline structure of barium titanate ceramics was determined to be tetragonal and independent of PMMA content. The electrical conductivity, humidity sensitivity, and hysteresis characteristic of fabricated ceramics changed with relative humidity, porosity, and PMMA content.

\*Corresponding author: e-mail: burcuertug@gmail.com