

## **Effect of Oxygen Partial Pressure During Firing on the High AC Field Response of BaTiO<sub>3</sub> Dielectrics**

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Source: JOURNAL OF THE AMERICAN CERAMIC SOCIETY Volume: 93 Issue: 4 Pages: 1081-1088 Published: APR 2010

Abstract: The effect of oxygen partial pressure during firing on the high field dielectric response of formulated and undoped BaTiO<sub>3</sub> ceramics was investigated. For formulated ceramics, the dielectric constant of both oxygen- and air-fired samples increased almost linearly with the amplitude of the ac-driving field. Formulated BaTiO<sub>3</sub> samples sintered in a reducing atmosphere produced a sublinear increase in the permittivity with the ac field amplitude. For undoped BaTiO<sub>3</sub> ceramics, the dielectric constant increased sublinearly over a wide range of oxygen partial pressures during firing. It is proposed for the formulated ceramics that the dopant-oxygen vacancy defect dipoles in the shell region accounted for the curvature in the field dependence of the permittivity. These defects appear to add a concentration of weak pinning centers to the potential energy profile through which domain walls move.