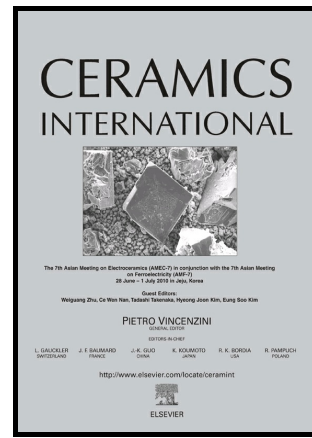


# Author's Accepted Manuscript

Effects of Sb and Nb dopants on electrical and microstructural properties of low-voltage varistor ceramics based on SnO<sub>2</sub>

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**Effects of Sb and Nb dopants on electrical and microstructural properties of low-voltage varistor ceramics based on SnO<sub>2</sub>**

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**Abstract**

It is shown that an addition of Sb<sub>2</sub>O<sub>5</sub> or Nb<sub>2</sub>O<sub>5</sub> (0.05-0.15 mol.%) to the system SnO<sub>2</sub>-CoO-Cr<sub>2</sub>O<sub>3</sub>-Bi<sub>2</sub>O<sub>3</sub> leads to the enhancement of grain growth. This effect is associated with the presence of the liquid Bi-phase in ceramics during sintering. The obtained ceramics possess non-linear current-voltage characteristics and can be used for preparing low voltage varistors. The non-linearity coefficient  $\alpha$  reaches 22 and the characteristic electric field 692 V/cm for Nb-doped materials and 11 and 421 V/cm respectively for Sb-doped ceramics materials. The results of dc and ac electrical measurements, as well as scanning electron microscopy are presented and discussed in terms of the known barrier model for varistors.

**Keywords**

B. Grain boundaries; Grain growth; Tin dioxide ceramics. C. Potential barrier; Low-voltage varistors.

**1. Introduction**

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