URN etd-0407109-183709-655
Author Hua-Chien Hung
Author's Email Address No Public.
Statistics This thesis had been viewed 49 times. Download 28 times.
Department
Year 2006
Semester 2
Degree Master
Type of Document Master's Thesis
Language zh-TW.Big5 Chinese
Title Influence of Dopant on the Properties of Barium Titanate Ceramics
Date of Defense 0000-00-00
Page Count 54

Keyword
BaTiO3 ceramics
dopant
sintering temperature
dielectric constant
dielectric losses.

Abstract
The influence of different dopant; such as NiO, Fe2O3, Cr2O3, Sb2O3 on the microstructure and dielectric properties, including sintering temperature dependence of permittivity, dielectric losses, has been investigated on BaTiO3 ceramics. Experiments reveal that incorporation of a proper content of dopant can control the grain growth, reduce the dielectric losses, and significantly improve temperature characteristics of the BaTiO3 ceramics. The experimental result, the dopant amount can control the crystalline grain grow up , change the loss tangent and dielectric constant.
When addition of 3wt% Sb2O3 dopants , frequency is smaller than 100KHz, the dielectric constant will be reduced with increase of frequency, when frequency greater than 100KHz, dielectric constant can increase and the frequency increase; Other of the dopant have the same trend, the dielectric constant will be decrease when frequency increase.
In the sintering temperature, measure it under frequency at the same, when addition of 3wt% Sb2O3 dopants, the sintering temperature in 1300℃,its dielectric constant will be smaller than ones that stilled come when 1250℃, but sintering temperature improve to 1350℃, the dielectric constant will be increase; The various kinds of components are increase of sintering temperature, and have the dielectric constant is reduce which the same measures frequency.
In dielectric losses, with the increase of frequency under the same sintering temperature, addition of 3wt% Cr2O3 dopants, the dielectric losses is greater than BaTiO3 , and addition of 3wt% Sb2O3 and Fe2O3 dopants , the dielectric losses is smaller than BaTiO3.
So addition of 3wt% Fe2O3, can reduce the sintering temperature , the dielectric losses and dielectric constant will be decrease; Addition of 3wt% NiO will reduce the sintering temperature, but its change is too great, the making course is not easy to control ; Addition of 3wt% Sb2O3 will reduce the sintering temperature, improve the dielectric constant, reduce dielectric losses; Addition of 3wt% Cr2O3 is it can reduce characteristic of BaTiO3, increase of sintering temperature and the dielectric losses, reduce of the dielectric constant.
Advisory Committee Wen-Chung Chang - advisor

Files etd-0407109-183709-655-001.pdf

indicate access worldwide
Date of Submission 2007-07-13