

Electrical and Dielectric Behavior of Pb-based Materials

Adolfo Franco

Universidade Católica de Goiás - BRAZIL

Abstract

Polycrystalline samples of $\text{Pb}(\text{Mg}_{1/4}\text{Ni}_{1/4}\text{W}_{1/2})\text{O}_3$ were prepared according to two different routes: (1) starting from the mixture of lead, magnesium, nickel and tungsten oxides as sintering aid for enhancing densification; and (2) starting from the combustion reaction in the presence of urea, with and without the cobalt additions. SEM, XRD and TGA/DTA characterized the obtained powders. Pellets pressed in disc shape from both powders were sintered at different temperatures in air atmosphere. Electrical conductivity (σ), dielectric constant (ϵ') and loss ($\tan \delta$) were measured in function of frequency. Dielectric anomaly and ferroelectric phase transition were observed at 80C. The variation of dc resistivity of the material with temperature shows its semiconducting behaviour. Also it was observed that the dielectric constant and loss of the materials varied with frequency at room temperature.