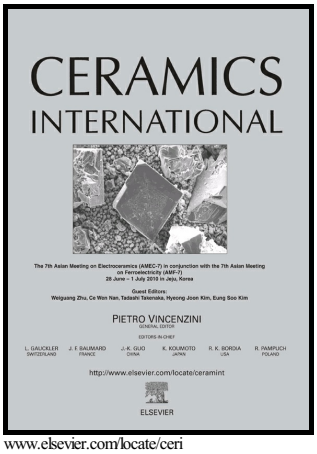

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PII: S0272-8842(18)31919-9
DOI: https://doi.org/10.1016/j.ceramint.2018.07.176
Reference: CERI18898

To appear in: *Ceramics International*

Received date: 14 July 2018
Revised date: 18 July 2018
Accepted date: 19 July 2018

Cite this article as: N. Suresh Kumar, R. Padma Suvarna, K. Chandra Babu Naidu, G. Ranjith Kumar and S. Ramesh, Structural and Functional Properties of Sol-Gel Synthesized and Microwave Heated $Pb_{0.8}$ $Co_{0.2-z}La_zTiO_3$ (z=0.05−0.2) Nanoparticles, *Ceramics International,* https://doi.org/10.1016/j.ceramint.2018.07.176

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Abstract

The present work reports the effect of La-substitution on structural and functional properties of lead cobalt titanate (PCT) perovskite structure as a function of variation of Co-content. The sol-gel synthesized and microwave heated $Pb_{0.8}$ $Co_{0.2-z}La_zTiO_3$ (z = 0.05, 0.1, 0.15 & 0.2) (PCLT) nanoparticles showed the presence of complete cubic phases while few were noted to be tetragonal lead titanate (PT) phases. The surface morphology was examined by field emission scanning electron microscope (FESEM) and high resolution transmission electron microscope (HRTEM). The HRTEM revealed fibers like nanoparticles at z = 0.15 and 0.2. The Fourier transform infrared spectra attributed the presence of metal oxide bonds. Furthermore, the wide optical band gap energy (E_{op}) was acquired to be changing from 2.32 to 3.20 eV. In addition, the electrical parameters such as dielectric constant (ε'), dielectric loss (ε''), ac & dc-electrical conductivity (σ_{ac} & σ_{dc}), complex dielectric modulus (M^*) and complex impedance (Z^*) were studied as a function of frequency (f) and composition. Using