Analysis of the Crystalline Phases of PLZT doped with Nd, Ho, Er, Tm, Yb

Yvonne P. Mascarenhas[a], Leandro D. Santana[a], Ducinei Garcia[b], Mirta M. Caraballo[a], *[a]Institute of Physics of São Carlos, USP, São Carlos, SP, Brazil. [b]Department of Physics, UFScar, São Carlos, SP. Brazil.* E-mail: yvonne@if.sc.usp.br

The addition of La to PZT improves densification, transparency and electro-optical properties. To further improve those qualities samples of PLZT doped with Yb, Ho, Tm, Er and Nd were produced and characterized by XRD (Rigaku-Denki rotating anode source RU-200 B, λ= 1.5408, i=100mA, V=50kV, θ-2θ scan from 15 to 120^o, step 0.02^o, time = 5sec, room temperature, Rietveld Method, GSAS package of programs) Samples of PLZT 65/35 and 9% La were produced with 1, 2, 4% of Yb and syntherized at room temperature. They presented systematically a mixture of Rhombic (R3cH) and tetragonal (P4/mm) phases. It was observed that less than 1% Yb incorporated with the excess forming a third phase of $Zr_2Yb_4O_{12}$. For this reason PLZT samples containing only 1% of rare earth were prepared and syntherized at high temperature. It was observed the formation of only the rhombohedral phase. The rare earth ions occupied both sites A and B of the perovskyte structure with sof respectively of 0.099 and 0.0232 for Nd, 0.0102 and 0.0130 for Ho, 0.0179 and 0.0164 for Er, 0.058 and 0.0215 for Tm and 0.00 and 0.0028 for Yb.

Acknowledgemnts: FAPESP and CNPq

Keywords: ferroelectricity, PLZT, rare earth