STUDY OF THE SOLID SOLUTIONS SERIES FORMED WITH BISMUTH TITANATE AND RARE EARTH CATIONS

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Bismuth titanate $Bi_4Ti_3O_{12}$ belongs to the Aurivillius type compounds consisting of $Bi_2O_2^{2+}$ layers alternating with perovskite like $Bi_2Ti_3O_{10}^{2-}$ layers. Due to its high piezoelectric coefficient, this material is a suitable candidate for high temperature applications. To study the effect on the properties of the bismuth titanate when it is doped with different cations, we synthesised four solid solutions series with different rare earths. In this work a complete crystal-chemical study of these four solid solution series, which were formed with $Bi_4Ti_3O_{12}$ and La^{3+}, Nd^{3+}, Dy^{3+} and Pr^{3+}, is presented. The series were synthesised by coprecipitation and characterized by X-Ray diffraction, electron microscopy and density measurements. Solid solution limits were determined and the variation of the cell parameters with the composition was measured. Finally, the effect of the rare earth cations on the microstructure of the solid solutions was analysed.