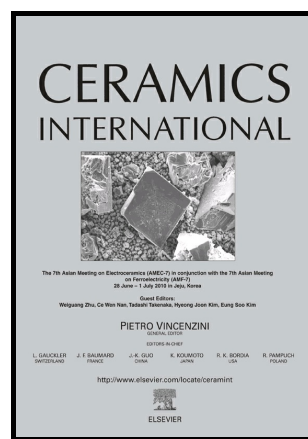


Structural-microstructural characterization and optical properties of $\text{Eu}^{3+}, \text{Tb}^{3+}$ -codoped $\text{LaPO}_4 \cdot n\text{H}_2\text{O}$ and LaPO_4 nanorods hydrothermally synthesized with microwaves

María T. Colomer, Lidia Zur, Maurizio Ferrari, Angel L. Ortiz



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Structural-microstructural characterization and optical properties of $\text{Eu}^{3+}, \text{Tb}^{3+}$ -codoped $\text{LaPO}_4 \cdot n\text{H}_2\text{O}$ and LaPO_4 nanorods hydrothermally synthesized with microwaves

María T. Colomer^{a*}, Lidia Zur^{b,c}, Maurizio Ferrari^{c,b}, Angel L. Ortiz^d

^aInstituto de Cerámica y Vidrio, CSIC, C/Kelsen 5, 28049 Madrid, Spain

^bCentro di Studi e Ricerche “Enrico Fermi”, Piazza del Viminale 1, 00184 Roma, Italy

^cIFN-CNR CSMFO Lab. and FBK Photonics Unit, via alla Cascata 56/C Povo, 38123 Trento, Italy

^dDepartamento de Ingeniería Mecánica, Energética y de los Materiales, Universidad de Extremadura, Avda. de Elvas S/N, 06006 Badajoz, Spain

*Corresponding author. María T. Colomer Tel.: + 34 91 735 5840; fax: +34 91 735 5843.
tcolomer@icv.csic.es

Abstract

Rhabdophane-type $\text{Eu}^{3+}, \text{Tb}^{3+}$ -codoped $\text{LaPO}_4 \cdot n\text{H}_2\text{O}$ single-crystal nanorods with the compositions $\text{La}_{0.99999-x}\text{Eu}_x\text{Tb}_{0.00001}\text{PO}_4 \cdot n\text{H}_2\text{O}$ ($x=0-0.03$), $\text{La}_{0.99999-y}\text{Tb}_y\text{Eu}_{0.00001}\text{PO}_4 \cdot n\text{H}_2\text{O}$ ($y=0-0.010$), and $\text{La}_{0.99999-z}\text{Tb}_z\text{Eu}_{0.000007}\text{PO}_4 \cdot n\text{H}_2\text{O}$ ($z=0-0.012$) were hydrothermally synthesized with microwaves. It is shown that the $\text{Eu}^{3+}, \text{Tb}^{3+}$ codoping does not affect the thermal stability of these nanorods, which is due to the formation of substitutional solid solutions with both Eu^{3+} and Tb^{3+} replacing La^{3+} in the crystal lattice. Moreover, it is also shown that monazite-type $\text{Eu}^{3+}, \text{Tb}^{3+}$ -codoped LaPO_4 single-crystal nanorods can be obtained by calcining their

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