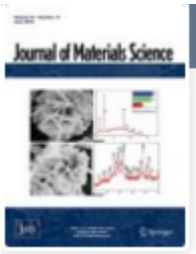

Journal of Materials Science

2008, Volume 43, Issue 2, pag. 680-683

Cathodoluminescence characterization of rare earth doped composite materials based on porous GaP

Sánchez B., Méndez B., Piqueras J., Sirbu L., Tiginyanu I. M., Ursaki, V. V.

https://doi.org/10.1007/s10853-007-2163-z

Abstract

Porous GaP layers doped with erbium or europium elements have been obtained by electrochemical etching and further impregnation processes. The thermal treatments for optical activation of rare earth (RE) ions lead to partial oxidation of porous GaP skeleton and a composite material is obtained. The presence of ErPO4 and EuPO4 oxide nanophases is detected by X-ray diffraction (XRD) analysis. Visible luminescence from RE ions in the composite material has been investigated by means of the cathodoluminescence (CL) technique in the scanning electron microscope. Intense red and green emission lines characteristic from Er3+ and Eu3+ ions dominate the CL spectra in the case of parallel and regular nanotubes in the samples. The role of the oxygen content and the detected phases in the luminescence results are discussed.