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Electrosteric colloidal stabilization for obtaining SrTiO₃/TiO₂ heterojunction: microstructural evolution in the interface and photonics properties

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ABSTRACT

Researches on solids heterojunctions has proven to be an important field for technological applications due to synergism achieved by interface phenomena. In this work, we present an understanding of SrTiO₃/TiO₂ interface and its effects on structural and microstructural characteristics, and relate them to photoluminescence properties of heterojunctions obtained by a simple method. It was observed that SrTiO₃ proportion directly influences the structural order-disorder, as observed by X-Ray diffraction, Raman spectroscopy and Transmission electron microscopy. Photoluminescence behavior of heterojunction with 1% of SrTiO₃ showed a shift to blue emission region compared to TiO₂, and enhanced of emission intensity compared to SrTiO₃, resulted from defects generated by interface effects, attracting possible applications on selective color emitter. Therefore, we conclude that in same materials phases, nature and concentration of structural defects has strong dependence of SrTiO₃ concentration, which leads to different photoluminescence properties.

Keywords: *Heterojunction; Interface; SrTiO₃/TiO₂; Photonic.*

1. Introduction

In recent years, the search for functional materials has grown due to increasing demand for better electronic device technologies, particularly the optoelectronics devices. Nanocomposite stand out in this field due to the synergistic effect resulting from the junction of two different materials phases promoting its applications in several devices, such as solar

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