

# SAIP 2011



Contribution ID : 389

## **The influence of Pr<sup>3+</sup> co-doping on the photoluminescence and cathodoluminescence properties of SiO<sub>2</sub>:Eu<sup>3+</sup> /Tb<sup>3+</sup>.**

Wednesday 13 Jul 2011 at 17:00 (02h00')

### **Content :**

Pr<sup>3+</sup>-Tb<sup>3+</sup>, and Pr<sup>3+</sup>-Eu<sup>3+</sup> ion pairs co-doped in SiO<sub>2</sub> matrix were prepared by a sol-gel method. The photoluminescence (PL) measurements revealed the red and green emissions centred at 614 nm (5D<sub>0</sub>-7F<sub>2</sub>) and 541 nm (5D<sub>4</sub>→7F<sub>5</sub>) for single doped Eu<sup>3+</sup> and Tb<sup>3+</sup> ions in SiO<sub>2</sub>, respectively. Co-doping of Eu<sup>3+</sup> and Tb<sup>3+</sup> ions with Pr<sup>3+</sup> in SiO<sub>2</sub> showed that the energy transfer between Pr<sup>3+</sup> and nearest Eu<sup>3+</sup> and Tb<sup>3+</sup> ions takes place. At the same time, however, there was evidence of luminescence quenching of Eu<sup>3+</sup> and Tb<sup>3+</sup> emissions at certain concentrations of Pr<sup>3+</sup>. The quenching was also confirmed by cathodoluminescence (CL) measurements recorded from the same powders. Possible mechanism of energy transfer from Pr<sup>3+</sup> to Eu<sup>3+</sup> and Tb<sup>3+</sup> and its quenching effects are discussed.

### **Level (Hons, MSc, PhD, other)? :**

PhD

### **Consider for a student award (Yes / No)? :**

NO

### **Short Paper :**

YES

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**Session classification :** Poster1

**Track classification :** Track A - Condensed Matter Physics and Material Science

**Type :** Poster Presentation