



# Generation of white photoluminescence from Strontium Silicate phosphor doped with lanthanides.

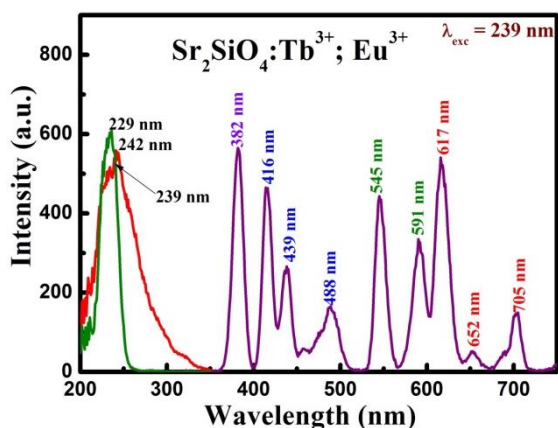
**Modiehi Amelia Tshabalala**

In recent years, the study of the synthesis and characterization of white light emitting phosphors for application in white light emitting diodes (LEDs) has generated attention worldwide. In the white light LEDs, white light can be generated from a combination of three primary colours, namely blue, green and red emitted from different LED chips or from a combination of blue LED with a yellow-emitting phosphor

(Figure 1). The problems with these traditional white LEDs is that the YAG:Ce<sup>3+</sup> phosphor that is used as a source of yellow light has been reported to show high thermal quenching and poor colour rendition, and the efficiency of the blue emission in the three primary colours converter system is often affected by re-absorption by the red or green phosphor. This problem can be solved by developing a single host phosphor that can absorb in the UV region and emit white light. In our study we have synthesized Sr<sub>2</sub>SiO<sub>4</sub> co-doped Tb<sup>3+</sup> and Eu<sup>3+</sup> (Figure 2) where we obtained a simultaneous emission of blue and green coming from Tb<sup>3+</sup> transitions and red emission from Eu<sup>3+</sup> transitions.



**Figure 1: Schematic structural presentation of Sr<sub>2</sub>SiO<sub>4</sub> and applications of the phosphor.**



**Figure 2: Photoluminescence excitation and PL emission spectrum of Sr<sub>2</sub>SiO<sub>4</sub>:Tb<sup>3+</sup>; Eu<sup>3+</sup> phosphor excited at 239 nm.**