

## Afterglow of Pr<sup>3+</sup> doped in cadmium silicate

Lucas C. V. Rodrigues\*, Roberval Stefani\*, Carlos A. A. Carvalho\*, Cláudia A. Kodaira\*\*, Maria C. F. C. Felinto\*\* and Hermi Felinto de Brito\*

<sup>1</sup>Laboratório dos Elementos do Bloco-f, Departamento de Química Fundamental, IQ-USP-SP.

<sup>2</sup>Instituto de Pesquisas Energéticas e Nucleares IPEN, São Paulo-SP.

### ABSTRACT

*Afterglow or Persistent luminescent materials are part of everyday life, finding large use in applications such as luminous paints, emergency lighting, safe traffic, wall painting, films, artificial fibres, rubbers, textiles ceramics and various articles. Long-lasting phosphorescence, a phenomenon due to the thermal stimulated recombination of holes and electrons at traps, which leave holes or electrons in a long-lived excited state at room temperature, is an interesting phenomenon in which the material persists for a long time after the removal of the excitation source. This present work is aimed at searching for the orange light-emitting long-lasting phosphors. The introduction of Pr<sup>3+</sup> ions into the CdSiO<sub>3</sub> host produces a highly dense trapping level, which is responsible for the long-lasting phosphorescence at room temperature. It is considered that the long-lasting phosphorescence is due to persistent energy transfer from the electron traps to the Pr<sup>3+</sup> ions, which creates the persistent luminescence of Pr<sup>3+</sup> to produce the orange light-emitting long-lasting phosphorescence.*