



DEPARTMENT OF ASTRONOMY

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Internal quantum efficiency and energy transfer processes in Ce³⁺ co-doped ZrO₂: Eu³⁺ nanorods

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Abstract content
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Cerium co-doped ZrO₂: Eu³⁺ nanorods was synthesized by a simple chemical dehydration route and their structural, morphological and optical properties were investigated. Structural studies revealed mixed-phases of monoclinic and tetragonal Bravais lattices. Nanorods of different dimensions were observed on the scanned images. Excitation and absorption spectra revealed the dominance of the Eu³⁺ - O²⁻ charge transfer states band over the intraconfigurational lines of the activator ion. A broad emission band with center maximum at 465 nm is attributed to both Ce³⁺ ion and the host band emissions. Electronic transitions in the range 500 nm to 650 nm are assigned to the Eu³⁺ ion. No significant energy transfer was observed because concentration quenching process dominated the energy transfer process. The internal quantum efficiency decreased with increasing Ce³⁺ concentration.

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Level for award (Hons, MSc, PhD, N/A)?

N/A

Main supervisor (name and email) and his / her institution

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