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Green synthesis of Europium oxide Nanoparticles by Hibiscus sabdariffa flower extract: Main physical and optical properties

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This contribution reports on the synthesis and the main physical properties of Europium (III) oxide (Eu₂O₃) nanocrystals synthesized for the first time by a completely green physical-chemistry process using Hibiscus sabdariffa flower natural extract as an effective chelating agent. Eu2O3 nanoparticles synthesized via green chemistry process would be beneficial for the development of nontoxic, clean and environmentally friendly biosynthesis procedure. The structural and optical properties of such biosynthesis nanocrystals were analyzed by High Resolution Transmission Electron Microscopy (HRTEM), Scanning Electron Microscopy (SEM) showed the images of small NPs formed, from this it was established that the Eu₂O₃ NPs are nano-scaled with a mixed population of crystalline particles, Electron Dispersive X-rays Spectroscopy (EDS), X-Rays Diffraction (XRD) where the grain size of nanoparticles was calculated using Debye-Scherrer approximation and ranged within 14 nm to 25 nm and the calculated lattice constant using the relation was found to be a_{exp}=10.87812 Å which was slightly larger than the bulk value, Fourier Transform Infrared Spectroscopy (FT-IR), Raman, Ultraviolet and visible spectrometer (UV-Vis-NIR) as well as room temperature photoluminescence (PL). The luminescence properties of such cubic were characterized by an intense red emission centered at 614.8 nm (⁵D₀-⁷F₃).

These results represent an important step forward in investigating and determining the properties of Eu2O3 nanoparticles synthesized via green chemistry process. It is a promising cost-effective path and energy wise non-consuming with zero waste end products for highly stable and well-characterized nanoparticles.

Apply to be
 considered for a student
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yes

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

MSc

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

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Would you like to <br> submit a short paper <br> for the Conference
 Proceedings (Yes / No)?

No

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