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## Optical, ESR and surface state XPS investigation in 0D ZnO nanostructures doped with rare earth ions

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**Abstract content <br> &nbsp; (Max 300 words)<br><a href="http://events.saip.org.za/getFile.py/?target="\_blank">Formatting &<br>Special chars</a>**

We report on the (micro)-structural, optical, morphological, surface state and magnetic characteristics of undoped and rare earth (RE) doped zinc oxide (ZnO) 0-dimension (0D) semiconductor nanostructures, which were successfully synthesized via a facile sol-gel process. The optical investigation of as-synthesized samples as revealed by optical absorption spectroscopy showed a blue shift of the absorption band-edge as compared to the bulk material, which could be an effective indication of quantum confinement effect. From the transmission electron microscopy (TEM) results, it was observed a morphological change as the dopant concentration was increased probably due to the Ostwald ripening effect; furthermore, the highly crystalline nature of the synthesized 0D nanostructures was confirmed. Finally, defects state in the semiconductor nanostructures was studied using photoluminescence (PL) spectroscopy, x-ray photoelectron spectroscopy (XPS) and Electron Spin resonance (ESR).

**Apply to be<br> considered for a student <br> &nbsp; award (Yes / No)?**

Yes

**Level for award<br>&nbsp;(Hons, MSc, <br> &nbsp; PhD)?**

MSc

**Main supervisor (name and email)<br>and his / her institution**

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

Yes

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