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## Synthesis, structural and optical characterisation of cobalt (Co) and indium (In) co-doped ZnO nanoparticles

*Tuesday, 30 June 2015 11:30 (20 minutes)*

**Abstract content**   
 (Max 300 words)

Co and In co-doped nanopowders of ZnO as well as In and Co singly doped ZnO were successfully prepared using sol-gel method. The synthesized samples were characterised using x-ray diffraction (XRD), UV-vis spectroscopy, Raman spectroscopy (RS), Transmission Electron Microscopy and EDS. The effects of Co and In co-doping on the structural and optical properties were investigated. XRD results showed no peaks associated with  $\text{In}^{3+}$  or  $\text{Co}^{2+}$  ions indicating that  $\text{In}^{3+}$  and  $\text{Co}^{2+}$  ions substituted for  $\text{Zn}^{2+}$  ions in the ZnO wurtzite structure. This was corroborated by the EDS results. Doping ZnO nanoparticles with In and Co significantly reduced the grain sizes whereas the lattice parameters were not significantly affected. TEM results confirmed that the nanoparticles were spherically shaped. Raman spectroscopy also confirmed that the ZnO nanoparticles were of a wurtzite hexagonal structure. Single doping reduced the energy band gaps and co-doping reduced them even further.

**Apply to be considered for a student award (Yes / No)?**

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 submit a short paper for the Conference Proceedings (Yes / No)?**

yes

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yes

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