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## Synthesis, characterization and photoluminescence of ZnO: Cd rosette-like nanostructures using solution process

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### SUPERLATTICES AND MICROSTRUCTURES

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### Abstract

Well crystalline undoped and Cd-doped ZnO rosette-like structures were successfully synthesized at low temperature (80 degrees C) via solution process technique during 30 min. Zinc nitrate, cadmium nitrate, sodium hydroxide and hexamine were used as starting materials. The morphology and microstructure were determined by field emission scanning electron microscopy (FE-SEM), X-ray diffraction (XRD), transmission electron microscopy (TEM), energy-dispersive X-ray spectroscopy (EDX) and photoluminescence (PL) spectroscopy. X-ray diffraction indicated that the structure has a single phase with wurtzite structure. FESEM indicated that rosette like structures have been formed. This rosette consists of nanorods with length 210 and 460 nm and diameter 50 and 74 nm for undoped and Cd doped ZnO, respectively. HRTEM showed a decrease in the lattice parameter after the Cd doping. EDX showed that the amount of Cd incorporated into ZnO is 6.4 wt.%. Photoluminescence measurements taken on both doped and undoped samples showed that, in the Cd-doped ZnO nanostructures, the band-edge UV emission is blue shifted and the broad green emission intensity decreased. (C) 2012 Elsevier Ltd. All rights reserved.

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