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Effect of pH on ZnO nanostructures prepared by chemical bath method

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Abstract content
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ZnO powders were prepared by chemical bath method varying the pH using ammonia solution. The effect of pH of the precursor on the structure, morphology, optical and luminescence properties of ZnO nanostructures were investigated. The X-ray diffraction (XRD) patterns of the ZnO nanostructures correspond to the various planes of a single hexagonal ZnO phase. It was observed that the diffraction peaks increase in intensity with an increase in pH. The estimated average grain sizes calculated using the XRD spectra were found to be in the order of 38 ± 1 nm. It was observed that the estimated average grain sizes increases slightly with an increase in pH. The surface morphology study revealed that the grains are flakes-likes at low pH (< 6) but flower-like at high pH (12). The UV-Vis spectra showed a red shift with an increase in pH. The band gap energy of ZnO was found to decrease but the luminescence intensities increase with an increase in pH values. The maximum luminescence intensity was found at pH of 12.

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