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Effect of zinc acetateconcentrations on the structure, morphology and optical properties of ZnOnanoflakes synthesized by chemical bath deposition method

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Abstract content
   (Max 300 words)

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Zinc Oxide (ZnO) nanostructures were synthesized by chemical bath deposition method (CBD)from precursorscontaining varying molar concentrations of zinc acetate. The structure, morphology, optical and luminescence properties of the samples were investigated using X-ray diffraction (XRD), Scanning electron microscopy (SEM), ultraviolet spectroscopy (UV) and Photoluminescence (PL). The XRDresult shows that at low molar concentrations of zinc acetate the structure is modified cubic ZnO.As the molar concentration of zinc acetate increasesthe well-known hexagonal wurtzite structure of ZnOis developed.The average particle size estimated using Scherer's formula was about 37 nm. It was found that the average particle size increases with an increase in the molar concentration of zinc acetate. SEM observations showed the presence of nanocrystallites forming aggregated nanoflakes. The morphology was found to dependent on the concentration of zinc acetate.The UV-Vis spectra showed that the absorption band edge shift to the higher wavelength with an increase in molar concentration of zinc acetate. The band gap energy of ZnO nanostructures determined from UV reflectance spectra was found to decreasefrom 3.23 to 2.75 eV with an increase in the zinc acetate concentration. The PL results show that the luminescence intensities decrease with an increase in the molar concentration of zinc acetate. The maximum luminesce band was found around 464 nm without any significant shift in position.

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