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Growth of semiconductor nanoparticles in polymer matrices by nanosecond laser

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Semiconductors nanoparticles have been extensively studied due to their potential applications and novel properties. Although different methods have been reported for the synthesis of these semiconductor materials, more environmental-friendly approaches continue to attract attention. Here, we focus on the II–VI types of semiconductor nanoparticles as they represent ideal systems for dimension-dependent properties. In this report, nanosecond laser was used to effect the decomposition of metal complexes, and also the nucleation process of nanoparticles in polymer solutions. CdS, ZnS, and ZnO nanoparticles were successfully prepared. The effect of change in concentration of the polymer solutions on the properties of the nanoparticles was studied. The morphology, structure, and optical properties of the nanoparticles were investigated. An increase in concentration of the polymer solution influenced the morphology of the nanoparticles, and also resulted in a decrease in the band gap energy of the nanoparticles. These are ascribed to the increase in adsorption centres and reduction in the coalescent process of the nanoparticles in the polymeric matrix.

Biography

Damian C Onwudiwe completed his PhD in 2011 from University of Fort-Hare and Post-doctoral research studies in North-West University, South Africa. He is presently a Senior Lecturer at the Mafikeng campus of the North-West University, where he conducts research on the controlled synthesis and manipulation of materials' physical and chemical properties using different approaches. He has published more than 35 papers in international journals, and also serves as Editorial Member of different journals of repute.

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