Phyto-mediated synthesis, photocatalytic and biological activities of Zno, Cao, and Sno_2 nanoparticles

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Green chemistry proffers an alternative route to conventional physical and chemical method of nanoparticle synthesis, and has earned the interest of researchers worldwide. This is due to the several advantages which this synthetic method offers. Green synthesis of nanoparticles via the use of aqueous plant extract provides environmentally benign and cheap route to the synthesis of nanoparticles. In this work, we have synthesized ZnO, CaO and SnO_2 nanoparticles using aqueous broccoli extract and characterized the prepared nanoparticles with X-ray diffraction (XRD), transmittance electron microscopy (TEM), UV-vis absorption and fourier transform infrared (FTIR) spectroscopic techniques. Antibacterial activities of the nanoparticles have been evaluated against strains of *S. aureus* and *P. aeruginose* bacteria. The nanoparticles all exhibited greater antibacterial potency towards *S. aureus* than *P. aeruginose* bacteria with ZnO nanoparticles being the most potent against the aforementioned bacterial strains. Photocatalytic properties of the nanoparticles were studied for the reduction of methylene blue and bromocresol green. All the nanoparticles showed different degrees of photodegradations of the organics dyes and similarly ZnO nanoparticles displayed a greatest efficiency of photocatalytic degradation followed by SnO_2 and CaO nanoparticles exhibited the least efficiency.

Speaker Biography

Osuntokun J completed his Ph.D. in 2016 from University of Fort Hare, South Africa. He is presently a postdoctoral research fellow in North-West University, South Africa. He has about 10 publications in international reputed journals.

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