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Synthesis, characterization and electrical properties of Pd doped TiO₂ nanoparticles with enhanced visible light photocatalytic activity

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Synthesis of pure and Pd doped TiO₂ has been carried out using the easy hydrothermal method and characterized by standard analytical techniques, such as X-ray Diffraction analysis (XRD), Scanning Electron Microscopy (SEM), Transmission Electron Microscopy (TEM) and UV-Visible Spectroscopy. The XRD analysis shows no change in crystal structure of TiO₂ after doping with different concentration of Pd indicating single phase polycrystalline material. The SEM images confirm that Pd is well incorporated on the surface of TiO₂. The UV-Visible absorption analysis technique indicate that the doping of Pd into the TiO₂ lattice shift the absorption band towards the visible region. The electrical properties of the synthesized particle have been performed by monitoring the dielectric constant (ϵ), dielectric loss ($\tan \delta$) and ac conductivity with respect to frequency. The dielectric constant and dielectric loss decreases with the increase in frequency up to certain limits, after then on a further increase in frequency, they became independent. The a.c. conductivity increases with the increase of frequency. The dielectric property also decreases with the increase of the dopant concentration.

Biography

Omar A Al-Hartomy is the Associate Professor in University of Tabuk. He is the Director of advanced solid state and Nanotechnology lab at the University of Tabuk. He did his PhD Swansea University, Swansea, United Kingdom (UK). Presently, he is the Dean, Faculty of Science and University of Tabuk.

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