



ABSTRACT

Nanotechnology is a vast field likely fits in every discipline of sciences; by use of nanotechnology, tetra metal-composites have been fabricated by the Co-Precipitation method. Different transition metals (Ni, Sn, Cu) doped with ZnO to enhance the photocatalytic ability of zinc oxide. To study structural and optical properties of the tetra-metallic composites XRD, Particle size analyses, UV-Visible spectroscopy, and Photoluminescence spectroscopy has been conducted. The XRD shows the highest peak at angle 36.27° and the grain size is 16 nm. The bandgap of Cu, Ni, Sn doped ZnO became decrease as compared to ZnO because it shifted the wavelength from 360 nm to 380 nm in UV spectroscopy. The PL data shows orange-red color emission at 750nm with an excitation wavelength of 720 nm. The methyl blue dye was used for the degradation application, to evaluate the efficiency of tetra-metallic composites. The efficiency in the solar cell was high because it degrades within 4 minutes when compared with room and UV light; degrades in 6 min.