World Academy of Science, Engineering and Technology
International Journal of Materials and Metallurgical Engineering
Vol:16, No:02, 2022

Structure and Optical Properties of Potassium Doped Zinc Oxide

Authors : Lila A. Alkhattaby, Norah A. Alsayegh, Mohammad S. Ansari, Mohammad O. Ansari

Abstract : In this work, we doped zinc oxide ZnO with potassium K we have synthesized using the sol-gel method. Structural properties were depicted by X-ray diffractometer (XRD) and energy distribution spectroscopy, X-ray diffraction studies confirm the nanosized of the particles and favored orientations along the (100), (002), (101), (102), (110), (103), (200), and (112) planes confirm the hexagonal wurtzite structure of ZnO NPs. The optical properties study using the UV-Vis spectroscopy. The band gap decreases from 4.05 eV to 3.88 eV, the lowest band gap at 10% doped concentration. The photoluminescence (PL) spectroscopy results show two main peaks, a sharp peak at ≈ 384 nm in the UV region and a broad peak around 479 nm in the visible region. The highest intensity of the band-edge luminescence was for 2% doped concentration because of the combined effect of the decreased probability of nonradiative recombination and has better crystallinity.

Keywords : K doped ZnO, photoluminescence spectroscopy, UV-Vis spectroscopy, x-ray spectroscopy
Conference Title : ICFMSPM 2022 : International Conference on Fundamentals of Materials Science and Polymeric Materials
Conference Location : Jeddah, Saudi Arabia
Conference Dates : February 17-18, 2022