

## Structure and Optical Properties of Potassium Doped Zinc Oxide

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**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  $\approx 384$  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