

Assessment of Antimicrobial Activity of Chemical Bath Deposited Zinc Sulfide Thin Films

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Abstract: The unique structural, electronic, and optical characteristics of semiconductor nanocrystals resulting from their high surface to volume (S/V) ratio and the quantum confinement effect have attracted a lot of attention. Due to its stability, affordability, and low toxicity in electroluminescent applications, cubic ZnS, a semiconductor with a broad band gap, has drawn a lot of interest. The creation of zinc sulfide nanoparticles and their antimicrobial activity against topical skin pathogen, pathogens growing on food containers and Antifungal activity against fungus growing on walls are demonstrated in the current study. At room temperature, chemical bath deposition is used to create ZnS thin films. It is fast, innovative, and environment friendly synthesis method for zinc sulfide (ZnS) nanoparticles. Zinc Sulfide an important semiconductor material in the II-VI group with direct and significant band gap energy is 3.63–3.92 eV. Different characteristics of ZnS crystal include the massive ionization transition and phase that are stable in conditions of a normal atmosphere. Several physiochemical methods, including X-Ray Powder Diffraction (XRD), Scanning Electron Microscopy (SEM), UV-Visible spectroscopy, Energy Dispersive X-ray (EDX), and Transmission Electron Microscopy (TEM), were used to analyze the as-prepared ZnS thin films.

Keywords: ZnS thin films, Chemical Bath Deposition, Antimicrobial activity, Antifungal Activity

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