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ZnO NANOSTRUCTURES ASSISTED GROWTH BY DIFFERENT NH₄F CONCENTRATIONS FOR POTENTIAL PHOTOVOLTAIC APPLICATIONS

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ABSTRACT- In this study, different morphologies of ZnO nanostructures (NSs) were synthesized by adding ammonium fluoride (NH₄F) at different concentrations using the chemical bath deposition (CBD) method for exploration of photovoltaic applications. Morphology varies from well aligned hexagonal nanorods (NRs), to nanotetrods (NTs) and nanoflowers (NFs) as observed and revealed by field emission scanning microscopy (FESEM). X-ray diffraction spectrum (XRD) analysis confirmed good crystal quality of ZnO nanostructures (NSs) along (002). Ultraviolet-visible (UV-Vis) analysis confirms strong reflection suppression in the ultraviolet-near infrared (UV-NIR) range, giving a high green signal for solar cell applications. Finally, photoluminescence (PL) emission has shown both strong near band edge (NBE) and deep level emission (DLE) peaks indicating a promising signal for different applications such as for photo sensors and photo catalytic.

Keywords: ZnO, Ammonium fluoride, Nanostructures, FESEM, Photovoltaic.