

Synthesis and characterization of nickel oxide nanoparticles synthesized via chemical precipitation method

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Abstract: The Nickel oxide Nanoparticles were synthesized from Nickel Nitrate Hexahydrate aqueous solution under the chemical method at 90 °C. The average crystallite size was calculated from De-Bye Scherrer's equation. FESEM, EDX, XRD were used to characterize the structural features of the product. FTIR spectra confirmed the adsorption of the Nickel oxide nanoparticles. In addition, UV-visible absorption spectra were employed to estimate the band gap energy of the Nickel oxide nanoparticles. This method may be suitable for large scale production of Nickel oxide nanoparticles for practical applications. The effect of Nickel oxide nanoparticles is screened in vitro for antimicrobial activity by Disc diffusion method. The bacterial organisms used in this study are E.coli, Bascillus Subtilis and also fungi Aspergillus Niger. The observed inhibition zones for these nanoparticles are in the range of 8 mm for E. coli and 7 mm for Bascillus Subtilis and 7 mm for fungi Aspergillus Niger. The cytotoxicity activities of Nickel oxide nanoparticles screened by MTT assay. We have screened for one type of cancer cell-line i.e. MCF-7 (Breast Cancer), Nickel oxide nanoparticles obtained IC₅₀ values in the range of 32.59 ug/ml for MCF-7 cell line.

Keywords: Nickel Oxide Nanoparticles, SEM, EDX, XRD, FTIR, UV-Vis, Disc diffusion method, Cytotoxicity.