

Synthesis of NiO and ZnO Nanoparticles and Characterization for the Eradication of Lead (Pb) from Wastewater

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Abstract : Heavy metal ions such as Pb^{2+} , Cd^{2+} , Zn^{2+} , Ni^{2+} and Hg^{2+} , in wastewater are considered as the serious environmental problem. Among these heavy metals, Lead or Pb (II) is the most toxic heavy metal. Exposure to lead causes damage of nervous system, mental retardation, renal kidney disease, anemia and cancer in human beings. Adsorption is the most widely used method to remove metal ions based on the physical interaction between metal ions and sorbents. With the development of nanotechnology, nano-sized materials are proved to be effective sorbents for the removal of heavy metal ions from wastewater due to their unique structural properties. The present work mainly focuses on the synthesis of NiO and ZnO nanoparticles for the removal of Lead ions, their preparation, characterization by XRD, FTIR, SEM, and TEM, adsorption characteristics and mechanism, along with adsorption isotherm model and adsorption kinetics to understand the adsorption procedure.

Keywords : heavy metal, adsorption isotherms, nanoparticles, wastewater

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