

Development of Zinc Oxide Coated Carbon Nanoparticles from Pineapples Leaves Using SOL Gel Method for Optimal Adsorption of Copper ion and Reuse in Latent Fingerprint

Authors : Bienvenu Gael Fouda Mbanga, Zikhona Tywabi-Ngeva, Kriveshini Pillay

Abstract : This work highlighted a new method for preparing Nitrogen carbon nanoparticles fused on zinc oxide nanoparticle nanocomposite (N-CNPs/ZnONPsNC) to remove copper ions (Cu^{2+}) from wastewater by sol-gel method and applying the metal-loaded adsorbent in latent fingerprint application. The N-CNPs/ZnONPsNC showed to be an effective sorbent for optimum Cu^{2+} sorption at pH 8 and 0.05 g dose. The Langmuir isotherm was found to best fit the process, with a maximum adsorption capacity of 285.71 mg/g, which was higher than most values found in other research for Cu^{2+} removal. Adsorption was spontaneous and endothermic at 25°C. In addition, the Cu^{2+} -N-CNPs/ZnONPsNC was found to be sensitive and selective for latent fingerprint (LFP) recognition on a range of porous surfaces. As a result, in forensic research, it is an effective distinguishing chemical for latent fingerprint detection.

Keywords : latent fingerprint, nanocomposite, adsorption, copper ions, metal loaded adsorption, adsorbent

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