Abstract

Scientists have challenges in synthesizing Manganese Oxide nanoparticles that are quick, cost-effective, and environmentally acceptable. Recently, there has been an increasing focus on developing biocompatible materials for various applications in healthcare, medicine, water treatment, and purification. In this study, manganese nanoparticles were synthesized using *Kiglia pinnata lam* leave extract. Manganese nanoparticles were characterized by techniques like UV, FTIR, and SEM to discuss the properties of Mn Nanoparticles. The UV results confirm the formation of MnO nanoparticles formation—the morphological observation done by using FE-SEM, which shows the spherical shapes having irregular clusters. Mn nanoparticles have wide surface area and magnetic properties, so they are used to enhance and visualize latent fingerprints on various surfaces, including glass, plastic, and paper. The latent fingerprint analysis results were excellent and visible to the naked eye. MnNPs have potential properties and can be used for further forensic applications like drug detection, blood identification, and gunshot residue analysis.