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**ABSTRACT**

Green synthesis of CuO, NiO, and Co3O4 nanoparticles used biowaste (Gomutra). The physicochemical properties of metal oxide nanoparticles have been studied using various methods. Green synthesised metal oxide nanoparticle crystal properties were calculated using X-ray diffraction. It shows that all metal oxide crystallite sizes are nanoscale (27–31 nm). XRD spectra of CuO nanoparticles confirm their monoclinic structure, which matches JCPDS data. FTIR spectra reveal the existence of functional groups and associated vibrational modes in NiO and Co3O4 nanoparticles, confirming a cubic crystal structure with lattice parameters of 4.175 Å and 8.054 The surface appearance and particle size of three metal oxide nanoparticles were examined by SEM and TEM. XRD matches the average particle sizes of three metal oxide nanoparticles, which are 33–40 nm. Thermal stability of synthesized metal oxide nanoparticles was measured from 0 to 1000 °C using TG-DTA. It shows that the nanoparticles are stable and suited for various applications. Their unique properties make these metal oxide nanoparticles excellent for gas detection, antibacterial activity, photocatalysis, and biosensing.