

Green Synthesis of Copper Oxide and Cobalt Oxide Nanoparticles Using Spinacia Oleracea Leaf Extract

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Abstract : The investigation aims at the synthesis of copper oxide and cobalt oxide nanoparticles using Spinacia oleracea leaf extract. These nanoparticles have many properties and applications. They possess antimicrobial catalytic properties and also they can be used in energy storage materials, gas sensors, etc. The Spinacia oleracea leaf extract behaves as a reducing agent in nanoparticle synthesis. The plant extract was first prepared and then treated with copper and cobalt salt solutions to get the precipitate. The salt solutions used for this purpose are copper sulfate pentahydrate ($\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$) and cobalt chloride hexahydrate ($\text{CoCl}_2 \cdot 6\text{H}_2\text{O}$). The UV-Vis, XRD, EDX, and SEM techniques are used to find the optical, structural, and morphological properties of copper oxide and cobalt oxide nanoparticles. The UV absorption peaks are at 326 nm and 506 nm for copper oxide and cobalt oxide nanoparticles.

Keywords : cobalt oxide, copper oxide, green synthesis, nanoparticles

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