



## Synthesis, Characterization and Study of Antimicrobial Activity of Amino Functionalized Manganese Oxide Nanoparticles

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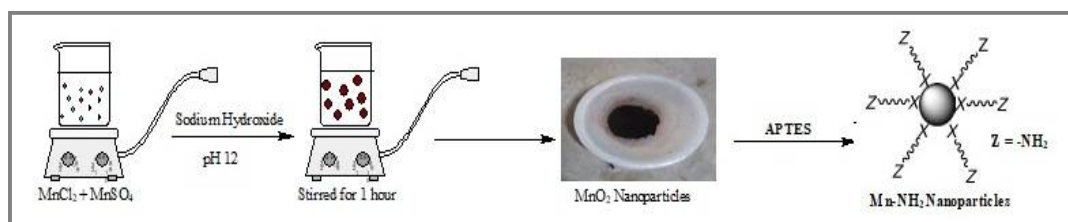
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### ABSTRACT

Manganese oxide nanoparticles find significant applications in advanced materials like batteries, water treatment and imaging contrast agents. In this work manganese oxide nanoparticle with controlled particle size was synthesized by co-precipitation technique under a fine control of pH using NaOH solution. The  $\text{MnO}_2$  nanoparticles thus synthesized were treated with 3-aminopropyl triethoxysilane (APTES) and amino functionalized manganese oxide ( $\text{MnO}_2\text{-NH}_2$ ) nanoparticles were obtained. The optical properties of nanoparticles were analyzed using UV-Vis spectrophotometer. The characteristic functional group present was analyzed using FTIR spectrophotometer. The surface morphology and particle size were studied by SEM and XRD analysis. TGA study was carried out to check the thermal stability of the manganese oxide nanoparticles. Antimicrobial activity of  $\text{MnO}_2$  and  $\text{MnO}_2\text{-NH}_2$  towards the both gram negative bacteria (*Escherichia coli*) and gram positive bacteria (*Staphylococcus aureus*) was studied using serial dilution method.

### Graphical Abstract



**Keywords:**  $\text{MnO}_2$  nanoparticles,  $\text{MnO}_2\text{-NH}_2$  nanoparticles, Surface functionalization.