



Role of capping agents in modulating physiochemical and biological properties of α -Fe₂O₃ Nanoparticles

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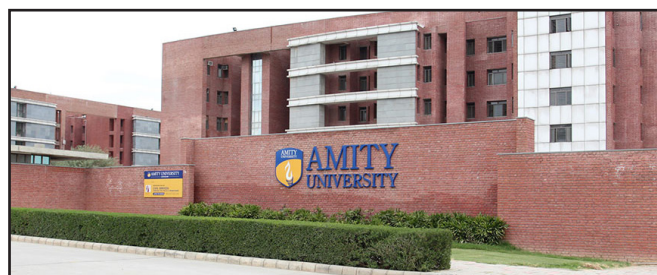
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Abstract:

Capping agents play a vital role in controlling size, morphology, and monodispersity of nanoparticles. To understand a comprehensive overview of influence of capping on structure and properties of hematite nanoparticles (HNPs), in this work, hematite nanoparticles (HNPs) with narrow size distribution has been synthesized by an economic co-precipitation method using capping agents like sodium citrate, Polyvinyl Pyrrolidone (PVP) and starch. A comparative in depth studies of structure, morphology, and surface analysis of synthesized capped and uncapped HNPs has been performed. Thermal, optical, magnetic and electrochemical properties of both capped and uncapped HNPs were also analyzed. Additionally, effect of capping agents on photocatalytic and antioxidant activities along with cytotoxicity of all fabricated nanoparticles studied against MDA-MB-231 cell line causing Breast Cancer along with probable mechanism and flow cytometry. Results revealed a definite improvement in grain size, crystallinity, optical, thermal and magnetic properties of HNPs happened due to efficient capping. Results also point that physiochemical and biological properties of HNPs can also be significantly improved due to successful capping. This knowledge will be helpful to understand the role of capping agents in determining properties of HNPs that can help for designing engineer HNPs in future.

Biography:

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References:

- Sharma, Pratibha & Kumari, Sujata & Rawat, Pooja & Srivastava, Chandra & Majumder, Sudip. (2020). Facile synthesis of a nanocomposite of hematite doped bentonite clay for removal of dye from wastewater.
- Kumari, Sujata & Sharma, Pratibha & Yadav, Sunny & Kumar, Jitender & Vij, Ankush & Rawat, Pooja & Kumar, Shalendra & Sinha, Chittaranjan & Bhattacharya, Jaydeep & Srivastava, Chandra & Majumder, Sudip. (2020). A Novel Synthesis of the Graphene Oxide-Silver (GO-Ag) Nanocomposite for Unique Physiochemical Applications. *ACS Omega*. XXXX. 10.1021/acsomega.9b03976.
- Majumder, Sudip & Dahiya, Ujjwal & Yadav, Sunny & Sharma, Pratibha & Ghosh, Debashree & Rao, Gyandshwar & Rawat, Varun & Kumar, Gaurav & Kumar, Anuj & Srivastava, Chandra. (2020). Zinc Oxide Nanoparticles Functionalized on Hydrogel Grafted Silk Fibroin Fabrics as Efficient Composite Dressing. *Biomolecules*. 10. 710. 10.3390/biom10050710.

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