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Comparison of Pure and Hybrid Nanoparticles using Ionic Liquid as a Capping agent

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Abstract : Ionic liquids are exceptional chemical compounds that are used in many areas of modern science. Due to their highly adjustable nature and incomparable properties, ionic liquids have become key players in the areas of synthesis, catalysis, extraction, electrochemistry, analysis, biotechnology, etc. In addition to the physical and chemical properties of ionic liquids, their high biological activity has attracted considerable attention from biochemists, ecologists and medical professionals. Due to the properties mentioned above, an imidazolium ionic liquid solvent was used for the synthesis of nanostructure nanoparticles. In the present work, cubic form of pure Fe₂O₃, spherical nature of pure Ag (0) and hexagonal shaped hybrid Ag- Fe₂O₃ were successfully synthesized by a simple co-precipitation, reduction and co-precipitation processes. The synthesized nanoparticles were characterized in detail by spectral studies such as IR, XRD, SEM, EDX and TEM analysis. The size and shape of the particles were performed by X-ray Diffraction (XRD), Scanning Electron Microscope (SEM) techniques and Transmission Electron Microscope (TEM) techniques. Quality quantity and purity of the products was checked by Energy Dispersive X-Ray Analysis (EDX).

Key words : Iron oxide nanoparticles, Silver nanoparticles, hybrid nanoparticles, Ionic liquid, TEM analysis.

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