**Abstract**

 Magnetic nanoparticles have emerged as a new class of important nanoparticles as they possess many exceptional properties like superparamagnetism, high coercivity, and so forth. These nanoparticles, when synthesized by conventional methods, have several limitations. Chemical synthesis methods involve the usage of toxic chemicals, formation of hazardous byproducts, and contamination from precursor chemicals. Hence, there is a growing need to develop clean, nontoxic and environment-friendly procedures for nanoparticle synthesis. In this present study, the plant extract of beet green (BETA VULGARIUS) acts as the low cost reducing and stabilizing agents. Magnetic nanoparticle synthesis is carried out at room temperature by mixing plant extract with ferric chloride solution in a fixed ratio. The formation and characterization of iron nanoparticles are confirmed by UV-Vis spectroscopy, X-Ray diffraction (XRD), Fourier Transmission infrared spectroscopy (FT-IR) and Scanning electron microscopy (SEM). The XRD analysis confirmed that the iron nanoparticles (FeNPs) are crystalline in nature. The FT-IR analysis revealed that bio molecules are involved in the synthesis and capping of iron nanoparticles. The morphology of the FeNPs is studied using SEM analysis. The green synthesis of magnetic nanomaterials may be utilized in the adsorption and remediation of heavy metal ions in soil and waste water.