ABSTRACT

In the following recent years, nanotechnology has been drawing much attention of the researchers as Nanomaterials and nanoparticles used in it, are of great importance. They have peculiar properties and various advanced technological and industrial applications including medicine, diagnosis, single-molecular detection for Gene sequencing technology, environmental purification, food safety, energy and fuel, transportation and personal care products. This study involves the research domain of synthesizing iron oxide nanoparticles from *Beta vulgaris* peel mediated extract via green synthesis. It is an economical, simple, easy, eco-friendly, rapid synthesis method mitigating toxic chemicals and byproducts for plant extract itself behave as stabilizing, reducing-capping agent. 6% w/v peel extract was prepared such that; heated for 20 mins, cooled and then filtered. Addition of 100 mM $FeCl_3$ solution to extract in 2:1 synthesized iron oxide nanoparticles. Iron oxide nanoparticles prepared were further analyzed and their characterization was done using different techniques UV-Vis determined sharp peak at 295 nm, FTIR spectral analysis depicted peaks at 3425, 2896, 2321, 1632, 1438, 1214 and 646 cm^{-1} representing stretch of hydroxyl, C-H, triple bond, carbonyl bond, C-H bending, ether C-O stretching and inorganic stretch respectively which interpreted successful FeO nanoparticle synthesis. SEM study stated the irregular and spherical iron oxide nanoparticles of average size of 48 to 73 nm. The green synthesized FeO NPs were then utilized to remove hexavalent chromium at and investigated for approx. 99% maximum removal efficiency at various parameters.