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ARSENIC ELIMINATION FROM GROUNDWATER THROUGH PLANT-MEDIATED MAGNETITE NANOPARTICLES SYNTHESIS AND ITS CHARACTERIZATION

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Abstract

Domestic drinking water arsenic infectivity has long been a source of concern. The current study concentrated on the production and classification of magnetite nanoparticles (MNps) from the collection of plants to evaluate their effectiveness in eliminating arsenic from groundwater. Using plant leaves *Abelmoschus esculentus* (*AE*) and *Arachis hypogea* (*AH*), magnetite nanoparticles (MNps-*AE* and MNps-*AH*) could be easily, economically, and eco-friendly synthesized to create novel inexpensive adsorbents to help remove arsenic as of earth water. The characterization of synthesized MNps was done by UV spectroscopy**,** SEM, X-ray diffraction, FT-IR**,** and a sample magnetometer with vibration. A very reliable technique for treating arsenic-contaminated groundwater, with MNps-*AE* and MNps-*AH* extracts creates adsorbents with an elevated ability for arsenic as well as magnetic properties. With the aid of kinetic, equilibrium experiments, also the corresponding statistical representations, the adsorption capacities of MNps-*AE* and MNps-*AH*, and the arsenic exclusion process of these special adsorbents, were evaluated. The Langmuir adsorption isotherm representation could be clarified by the adsorption isotherm for equally produced resources, more precisely than Freundlich's. The pseudo-second-order mannequin's narrative of the adsorption kinetics mutually with adsorbents revealed intraparticle dispersion was not a single stage for the adsorption practice that could control the rate.

Key words: Abelmoschus esculentus, *Arachis hypogea*, biomass, evaluation by UV, FT-IR, nano-magnetite, SEM, VSM, XRD

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