
Synthesis and Characterization of Green Nano Zero Valent Iron (GNZVI) from the extract of *Harpephyllum caffrum*

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Nano Zero Valent Iron (NZVI) are 5-40 nm sized Fe⁰/Fe-oxide particles which rapidly transform environmental contaminants to their mineral form. The unique feature of NZVI is the high surface area due to its small particle size which ensures excellent reactivity and applicability in remediation of persistent contaminants in soil, water and groundwater aquifers. However, there are serious concerns on the environmental fate of NZVI, its stability, toxicity and its dispersal. Several optimization methods such as polymeric coatings have been deployed toward designing NZVI with good stability, affinity and activity for contaminants degradation. All these methods come with their shortcomings especially in term of efficiency, cost, and potential toxicity. The synthesis and stabilization of nano zero valent iron using a natural plant extract may offer a better option.

In the ongoing research, Green Nano Zero Valent Iron was successfully synthesized from an extract of a South African weed plant (*Harpephyllum caffrum*) with known antioxidant properties and reagent, Iron III chloride. Systemic characterization by SEM showed a particle size predominantly between 20-60 nm of the synthesized GNZVI. Further characterization with TEM, XRD, XPS and BET will be performed on synthesized GNZVI to establish the comparable efficiency of the method used.

Key words

Nano particle, GNZVI, SEM, *Harpephyllum caffrum*, Iron III chloride.