

Transport of green synthetic iron nanoparticles in porous media: effect of injecting concentration and flow velocity

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Recently iron nanoparticles have become a very promising repair agent in the in-situ remediation of groundwater. However, the mechanism of the transport of green synthetic iron nanoparticles in porous media is less understood. In this paper, iron nanoparticles were synthesized from the *Hizikia Fusiforme* extracts and ferric chloride solution. Transport and deposition of green synthetic iron nanoparticles in porous media were investigated through sand column experiments and effects of injecting concentration and flow velocity were evaluated on the transport of iron nanoparticles. The results showed that deposition of iron nanoparticles in porous media were due to the irreversible attachment of sand grains and the straining of pore throats. The injecting concentration had a significant effect on the transport of iron nanoparticles, which were negatively correlated. The effluent concentration of iron nanoparticles was unaffected by the flow velocity at low injecting concentrations, however, the flow velocity was proportional to the deposition rate of iron nanoparticles. Moreover, the greater the flow velocity was, the more uniform the spatial distribution of iron nanoparticles in the sand column was.