

Adsorption of Reactive Dye Using Entrapped nZVI

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Abstract : Iron nanoparticles were used to cleanup effluents. This paper involves synthesis of iron nanoparticles chemically by sodium borohydride reduction of ammonium ferrous sulfate solution (FAS). Iron oxide nanoparticles have lesser efficiency of adsorption than Zero Valent Iron nanoparticles (nZVI). Glucosamine acts as a stabilizing agent and chelating agent to prevent Iron nanoparticles from oxidation. nZVI particles were characterized using Scanning Electron Microscopy (SEM). Thus, the synthesized nZVI was subjected to entrapment in biopolymer, viz. barium (Ba)-alginate beads. The beads were characterized using SEM. Batch dye degradation studies were conducted using Reactive black Water soluble Nontoxic Natural substances (WNN) dye which is one of the most hazardous dyes used in textile industries. Effect of contact time, effect of pH, initial dye concentration, adsorbent dosage, isotherm and kinetic studies were carried out.

Keywords : ammonium ferrous sulfate solution, barium, alginate beads, reactive black WNN dye, zero valent iron nanoparticles

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