Nitrate Removal from Water Using Synthesis Nanoscale Zero-Valent Iron (NZVI)

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Abstract. This study was conducted to investigate chemical reduction efficiency of nitrate by synthesis nanoscale zero-valent iron (NZVI) in aqueous solution, under aerobic condition. TEM image shows synthesis nano zero-valent iron has a size in the range of 40-150nm. Experimental results suggest that the reduction efficiency of nitrate decreased quickly with increasing initial pH value from 4 to 10 increased considerably with the increasing dosage of nanoscale zero-valent iron from 0.25 to 1g l⁻¹ and did not vary much with initial nitrate concentration changing from 30 to 50 mg l⁻¹ (NO₃-N). With reductive denitrification of nitrate by nano zero-valent iron, the removal rate of nitrate reached 80% in 60 min with nano zero-valent dosage of 1.0g l⁻¹ and pH 4, in room temperature.

Key words: nitrate, water, iron nanoparticles.

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