

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

Shimaalsadat Ziajahromi^{1,*}, Morteza Mehrdad², Meysam Khanizadeh³

¹ Environmental Sciences Research Institute, Shahid Beheshti University, G.C. Tehran, Iran; ² Department of Chemistry, Faculty of Sciences, University of Guilan, Rasht, Iran; ³ Faculty of Nuclear Engineering and Physics, Amirkabir University, Tehran, Iran

Accepted September, 12; 2012

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 1 g 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 1.0 g l⁻¹ and pH_{in}4, in room temperature.

Key words: nitrate, water, iron nanoparticles.

* Corresponding : E-Mail: Sh.Zia@sbu.ac.ir; Tel: +98-21-77273165

[#]This paper has been presented at ISALS-2012, Konya, Turkey