Prapatsorn Suntornchot 2011: Application of Nano Zero Valent Iron Particle (NZVI) in Treating Metolachlor and Cyclonite. Master of Science (Environmental Technology and Management), Major Field: Environmental Technology and Management, Department of Environmental Science. Thesis Advisor: Assistant Professor Tunlawit Satapanajaru, Ph.D. 95 pages.

These research objective was to study the effectiveness of nano zero valent iron (NZVI) in treating metolachor and cyclonite. The result had showed that 1% (w/v) of NZVI dose for treating 100 mg/L metolachlor and 0.25% (w/v) of NZVI dose for treating 20 mg/L cyclonite gave the best effectiveness. The efficiency of metolachlor and cyclonite were higher than 70 % within 120 minutes. The destruction of both metolchlor and cyclonite followed pseudo-first-order kinetic reaction. The destruction rate constant (k_{obs}) was 0.218×10^{-3} min^{-1} for metolachlor, 3.91×10^{-3} min^{-1} for cyclonite. The effect of pH solutions, aluminum salts and aerobic-anaerobic conditions were determided. The effectiveness of treating both chemicals by NZVI enhanced when pH (pH 4 > pH 7 > pH 10) was decreased and aluminium salt ($Al(SO_4)_3$, $AlCl_3$) was added. The effectivenesses of treating metolachlor and cyclonite in anaerobic condition were higher than treating in anaerobic condition. In addition, recovery of NZVI by washing of NZVI and non washing NZVI were not able to enhance the destruction efficiencies.

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