

NANOIRON TECHNOLOGY FOR ARSENIC-CONTAMINATED GROUNDWATER TREATMENT

Visanu Tanboonchuy¹, Jia-Chin Hsu², Nurak Grisdanurak^{1,3}, Chih-Hsiang Liao^{4*}

¹*Department of Chemical Engineering, Faculty of Engineering,
Thammasat University, Pathumthani, THAILAND.*

²*Department of Environmental Engineering and Science,
Chia Nan University of Pharmacy and Science, Tainan, TAIWAN.*

³*National Center of Excellence for Environmental and Hazardous Waste Management, Thammasat University,
Pathumthani, THAILAND.*

⁴*Department of Environmental Resources Management, Chia Nan University of
Pharmacy and Science, Tainan, TAIWAN.*

* *Corresponding author's email: chliao@mail.chna.edu.tw*

ABSTRACT

This study focused on arsenate removal in aqueous solution under various pH conditions. The results reveal that higher arsenate removal can be obtained in acidic environment rather than in base condition. Kinetic analysis suggests that arsenate removal can be described as a first-order reaction for all pH values studied; the reaction rate constants were 0.76 (pH=4), 0.16 (pH=7), and 0.04 min⁻¹ (pH=9). In addition, as a result of sorption investigation, the sorption performance was 43.62 (pH=4), 42.73 (pH=7), and 37.48 mg As/g iron (pH=9).

Keywords: Arsenic; Iron; Adsorption; Zero valent