

Accepted Manuscript

ZVI - Reactive Barriers for the Remediation of Soils Polluted with Clopyralid:
Are They Really Worth?

J. Vidal, C. Saez, P. Cañizares, V. Navarro, R. Salazar, M.A. Rodrigo

PII: S1385-8947(18)30956-2
DOI: <https://doi.org/10.1016/j.cej.2018.05.142>
Reference: CEJ 19158

To appear in: *Chemical Engineering Journal*

Received Date: 9 March 2018
Revised Date: 19 May 2018
Accepted Date: 23 May 2018



Please cite this article as: J. Vidal, C. Saez, P. Cañizares, V. Navarro, R. Salazar, M.A. Rodrigo, ZVI - Reactive Barriers for the Remediation of Soils Polluted with Clopyralid: Are They Really Worth?, *Chemical Engineering Journal* (2018), doi: <https://doi.org/10.1016/j.cej.2018.05.142>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

ZVI - Reactive Barriers for the Remediation of Soils Polluted with Clopyralid: Are They Really Worth?

J. Vidal¹, C. Saez², P. Cañizares², V. Navarro³, R. Salazar¹ y M.A. Rodrigo^{2,*}

¹ Departamento de Química de los Materiales. Facultad de Química y Biología. Universidad de Santiago de Chile. Chile

² Departamento de Ingeniería Química. Facultad de Ciencias y Tecnologías Químicas. Universidad de Castilla La Mancha. Campus Universitario s/n. 13071 Ciudad Real. Spain.

³ University of Castilla-La Mancha - Institute of Technology, Campus Universitario s/n, 16071 Cuenca, Spain

Abstract

In this work, the remediation of soil spiked with clopyralid is evaluated using two types of zero valent iron (ZVI) barriers coupled with electrokinetic soil flushing (EKSF). These barriers consist of soil merged with iron particles. In one of the tests conducted, granular milimetric iron was used, whereas in the other, iron was placed in the form of nanoparticles. The performance of this novel technology is compared to that of single EKSF technology. Tests were carried out in bench scale mockups (175 L) and they lasted one month. Over this period, soil underwent the application of an electric field of 1.0 V/cm between a row of three anodes and a row of three cathodes. Results indicate that ZVI barriers seriously affect electrokinetic flushes by preventing the mobility of pollutants to the electrode wells. However, they achieve a larger dehalogenation of clopyralid than single EKSF. There are no significant differences between the results obtained using the two sizes of ZVI and the volatilization of pollutants associated to thermal effects was almost prevented by means of capillary barriers implemented on top of the mockups. After the

Download English Version:

<https://daneshyari.com/en/article/6578237>

Download Persian Version:

<https://daneshyari.com/article/6578237>

[Daneshyari.com](https://daneshyari.com)