

World Congress and Expo on Recycling

July 20-22, 2015 Barcelona, Spain

Enhanced removal of BTEX/TCE/cis-DCE mixture using waste scrap tires immobilized with indigenous *Pseudomonas* sp.

Renata Alves de Toledo¹, Qihong Lu¹, Fei Xie¹, Junhui Li^{1,2} and Hojae Shim¹

¹University of Macau, China

²South China Agricultural University, China

The simultaneous aerobic removal of a mixture of BTEX (benzene, toluene, ethyl benzene, o,m,p-xylene), cis-dichloroethylene (cis-DCE) and trichloroethylene (TCE) from the artificially contaminated water using an indigenous bacterial isolate identified as *Pseudomonas plecoglossicida* immobilized on waste scrap tires was investigated. Suspended and immobilized conditions were compared for the enhanced removal of these volatile organic compounds. For the immobilized system, toluene, benzene and ethylbenzene were completely removed while the highest removal efficiencies of $99.0\pm 0.1\%$, $96.8\pm 0.3\%$, $73.6\pm 2.5\%$, and $61.6\pm 0.9\%$ were obtained for o-xylene,m,p-xylene, TCE and cis-DCE respectively. The sorption kinetics of contaminants toward tire surface was also evaluated and the sorption capacity generally followed the order of toluene > benzene > m,p-xylene > o-xylene > ethylbenzene > TCE > cis-DCE. Scrap tires showed a good capability for the simultaneous sorption and bioremoval of BTEX/cis-DCE/TCE mixture implying a promising waste material for the removal of contaminants mixture from industrial wastewater or contaminated groundwater.

Biography

Renata Alves de Toledo completed her PhD degree in Analytical Chemistry from University of Sao Paulo (IQSC- USP, Brazil) in 2006. She worked as a Postdoctoral fellow at the Brazilian Organization for Agricultural Research (EMBRAPA, Sao Carlos, Brazil) until 2008. Currently, she is a Postdoctoral fellow in environmental area at University of Macau, Faculty of Science and Technology. She has been involved in research projects on bioremediation of volatile organic compounds and on biodiesel production from yeast and microalga while treating food industrial wastewater.

toledora@gmail.com

Notes: