

Accepted Manuscript

Removal of pesticides from wastewater by ion pair centrifugal partition extraction using betaine-derived ionic liquids as extractants

Yannick De Gaetano, Jane Hubert, Aminou Mohamadou, Stéphanie Boudesocque, Richard Plantier-Royon, Jean-Hugues Renault, Laurent Dupont

PII: S1385-8947(15)01406-0
DOI: <http://dx.doi.org/10.1016/j.cej.2015.10.012>
Reference: CEJ 14281

To appear in: *Chemical Engineering Journal*

Received Date: 10 July 2015
Revised Date: 30 September 2015
Accepted Date: 4 October 2015

Please cite this article as: Y. De Gaetano, J. Hubert, A. Mohamadou, S. Boudesocque, R. Plantier-Royon, J-H. Renault, L. Dupont, Removal of pesticides from wastewater by ion pair centrifugal partition extraction using betaine-derived ionic liquids as extractants, *Chemical Engineering Journal* (2015), doi: <http://dx.doi.org/10.1016/j.cej.2015.10.012>

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.



1 **Removal of pesticides from wastewater by ion pair centrifugal partition extraction using**
2 **betaine-derived ionic liquids as extractants**

3 Yannick De Gaetano, Jane Hubert*, Aminou Mohamadou, Stéphanie Boudesocque, Richard
4 Plantier-Royon, Jean-Hugues Renault, Laurent Dupont*.
5 Université de Reims Champagne-Ardenne, Institut de Chimie Moléculaire de Reims (ICMR),
6 CNRS UMR 7312, UFR des Sciences Exactes et Naturelles, Bâtiment 18 Europol'Agro, BP
7 1039, F-51687 Reims Cedex 2, France.

8
9 **Abstract**

10 The extraction of pesticides from aqueous solutions using new ionic liquids (ILs) derived
11 from glycine betaine as extractants was investigated. These ILs incorporate cationic esters of
12 trimethyl(2-alkoxy-2-oxoethyl) ammonium (GBOC_n^+) associated with inorganic ClO_4^- or BF_4^-
13 anions. First, batch extraction experiments were performed by using the liquid-liquid biphasic
14 system IL/ethyl acetate/water (1:1:1; v/v) for four commonly used pesticides: 4-
15 chlorophenoxyacetic acid (4-CPA), 2,4-dichlorophenoxyacetic acid (2,4-D), 2-[(4-methyl-5-
16 oxo-3-propoxy-1,2,4-triazolin-1-yl)carbamidosulfonyl]benzoic acid methyl ester sodium salt
17 (propoxycarbazone) and 2-(4-isopropyl-4-methyl-5-oxo-2-imidazolin-2-yl)-5-methoxymethyl
18 nicotinic acid (imazamox). Then, the liquid-liquid extraction unit operation was intensified by
19 transposing the system into a Centrifugal Partition Extraction (CPE) device, using ethyl
20 acetate/*n*-butanol/water (1:4:5; v/v) as biphasic solvent system and potassium iodide, sodium
21 iodide or sodium perchlorate as potential displacers. The use of a lab-scale CPE column with
22 a capacity of 300 mL allowed the intensification of the extraction procedure. The extraction
23 and back-extraction of individual or mixture of pesticides were studied, with a particular
24 focus on the potential separation of individual pesticides and on the recyclability of the CPE
25 method. In optimal CPE conditions, a quantitative extraction for three of the four pesticides

Download English Version:

<https://daneshyari.com/en/article/6583232>

Download Persian Version:

<https://daneshyari.com/article/6583232>

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