

Accepted Manuscript

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PII: S1383-5866(17)31021-3

DOI: <http://dx.doi.org/10.1016/j.seppur.2017.05.003>

Reference: SEPPUR 13713

To appear in: *Separation and Purification Technology*

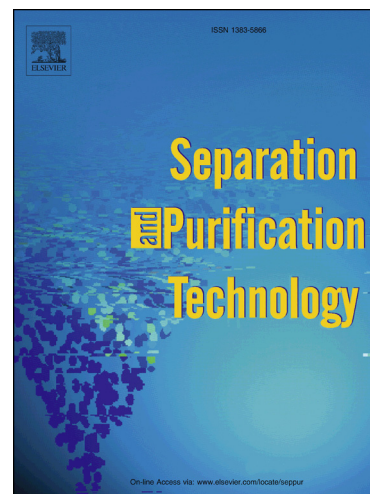
Received Date: 1 April 2017

Revised Date: 28 April 2017

Accepted Date: 2 May 2017

Please cite this article as: M. Maryami, M. Nasrollahzadeh, E. mehdipour, S. Mohammad Sajadi, Green synthesis of the Pd/perlite nanocomposite using *Euphorbia nerifolia* L. leaf extract and evaluation of its catalytic activity, *Separation and Purification Technology* (2017), doi: <http://dx.doi.org/10.1016/j.seppur.2017.05.003>

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Green synthesis of the Pd/perlite nanocomposite using *Euphorbia neriifolia* L.
leaf extract and evaluation of its catalytic activity

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ABSTRACT

A facile and one-step green process to synthesize palladium nanoparticles (Pd NPs) dispersed on perlite is reported. In this study, for the first time, we describe the successful assembly of the Pd/perlite nanocomposite using *Euphorbia neriifolia* L. leaf extract as a reducing and stabilizing agent. The Pd/perlite nanocomposite showed high efficiency in the catalytic reduction of nitroarenes such as 4-nitrophenol (4-NP), 2,4-dinitrophenylhydrazine (2,4-DNPH) to the corresponding amines. This catalyst also could exhibited a high activity towards the reduction of organic dyes such as Congo red (CR), Rhodamine B (RhB) and methyl orange (MO) by NaBH₄ in aqueous solution with high level of reusability. The catalytic reduction reactions were monitored by employing UV-Vis spectroscopy. The structure, morphology, and physicochemical properties were characterized by various analytical techniques such as transmission electron microscopy (TEM) images, field emission scanning electron microscope (FESEM), energy-dispersive X-ray spectroscopy (EDS), X-ray diffraction analysis (XRD) and FT-IR spectroscopy.

Keywords: *Euphorbia neriifolia* L., Pd/perlite nanocomposite; Reduction, Nitroarenes; Organic dyes

1. Introduction

Synthetic organic dyes from the textile, paper, plastics and cosmetic industries have led to serious contamination onto land and water in many countries worldwide. Weathering of organic dyes through oxidation, hydrolysis, or other chemical reactions occurring in the wastewater phase can produce toxic metabolites [1-4].

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