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PII: S2468-0230(18)30366-3
DOI: https://doi.org/10.1016/j.surfin.2018.08.006
Reference: SURFIN 232

To appear in: *Surfaces and Interfaces*

Received date: 17 July 2018
Revised date: 27 August 2018
Accepted date: 30 August 2018

Please cite this article as: S. Mohammad Sajadi , Kamal Kolo , Shorish M. Abdullah , Samir M. Hamad , Hana. S. Khalid , Ali. T. Yasin , Green synthesis of highly recyclable CuO/ eggshell nanocomposite to efficient removal of aromatic containing compounds and reduction of 4-Nitrophenol at room temperature, *Surfaces and Interfaces* (2018), doi: https://doi.org/10.1016/j.surfin.2018.08.006

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ABSTRACT

The CuO/ eggshell nanocomposite (NCs) was green synthesized using the extract of the pomegranate dried peel in a green root as a novel adsorbent nanocatalyst to efficient removal of aromatic compounds of crude oil sample from Shiwashok oil field in Iraqi Kurdistan as a model. Also, it was employed to reduction of 4-nitrophenole (4-NP) to 4-aminophenol (4-AP) at room temperature. The characterization of nanocomposite was using FE-SEM, EDS, elemental mapping and XRD analytical techniques. The spectrophotometrically results strongly demonstrated the excellent ability of nanocomposite on removing the aromatic containing compounds from the light crude oil sample and also reduction of 4-NP. Furthermore, the biosynthesized nano-adsorbent is quite active and stable for many cycles in both reactions. Facile and clean synthesis, simple preparation procedure, alterable supports, low cost and highly efficiency are the best features of this method.

Keywords: Light crude oil, Green synthesis, CuO/ eggshell NCs, Catalytic activity, Recyclability.

1. Introduction

Dispersion of nitro compounds in ecosystem is currently an important concern for their chemically and biologically stability. Because of their toxicity in aquatic ecosystems and their mutagenic or carcinogenic properties, the removal of them become a problematic issue and therefore, presenting and developing an efficient and eco- friendly processes to removal or convert harmful nitro compounds into safe intermediates is of great importance, [1–4].

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