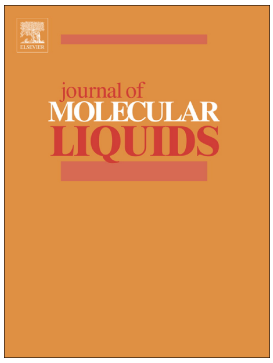

Removal of humic acid from aqueous solution using photocatalytic reaction on perlite granules covered by Nano TiO2 particles

H. Joolaei, M. Vossoughi, A. Rashidi Mehr Abadi, A. Heravi

PII: S0167-7322(17)31152-2
DOI: doi: 10.1016/j.molliq.2017.06.098
Reference: MOLLIQ 7544

To appear in: *Journal of Molecular Liquids*

Received date: 15 March 2017
Revised date: 17 June 2017
Accepted date: 21 June 2017

Please cite this article as: H. Joolaei, M. Vossoughi, A. Rashidi Mehr Abadi, A. Heravi , Removal of humic acid from aqueous solution using photocatalytic reaction on perlite granules covered by Nano TiO2 particles, *Journal of Molecular Liquids* (2017), doi: 10.1016/j.molliq.2017.06.098

Removal of Humic Acid from aqueous solution using

photocatalytic reaction on perlite granules covered by Nano particles.

H. Joolaei , M.Vossoughi, A. Rashidi Mehr abadi, A. Heravi

1. Introduction

One of the substances ubiquitously found in surface, ground, and soil waters is natural organic matter(NOM). The concentration of NOM in surface waters typically ranges from 0.1mg/L to 20mg/L. Humic acid (HA), as a major component of NOM, represents a major fraction of dissolved organic compounds in natural waters [1,2,3,4].

Humic acids are a product of microbiological, chemical, and photochemical transformation of plants and animal residues. In fact, they are complex mixtures of components, which can not be presented by any particular formula[5,6,7]. The main constituents of HA are aromatic and alphatic strucures as well as carboxylic, phenolic-OH , amino and quinone groups. HA carries an electric negative charge, resulting from the dissociation of carboxylic and phenolic-OH groups.

HA has been associated with the formation of toxic and cancerogenic disinfection byproducts (DBPs), such as Trihalomethanes, one of the most important DBPs which is formed through the chlorination process of drinking water. They can also cause environmental or health-related issues in water networks, particularly in water refining processes. Moreover, they can be a substrate for micro-organism growth, and thus result in clotting and trouble in the filtration unit. They can also contribute to bio fouling in pipelines carrying drinking water.

In a similar vein, HA can result in an undesirable odor and color ,yellow or brown, in the drinking water [8, 2,9]. Therefore, elimination of HA from natural waters is of paramount importance.