

Accepted Manuscript

Comparative study of modified expanded perlite with hexadecyltrimethylammonium-bromide and gallic acid for boron adsorption

Pelin Demircivi, Gulhayat Nasun Saygili



PII: S0167-7322(17)34832-8

DOI: <https://doi.org/10.1016/j.molliq.2018.01.116>

Reference: MOLLIQ 8570

To appear in: *Journal of Molecular Liquids*

Received date: 11 October 2017

Revised date: 5 January 2018

Accepted date: 20 January 2018

Please cite this article as: Pelin Demircivi, Gulhayat Nasun Saygili , Comparative study of modified expanded perlite with hexadecyltrimethylammonium-bromide and gallic acid for boron adsorption. The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. Molliq(2017), <https://doi.org/10.1016/j.molliq.2018.01.116>

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.

Comparative study of modified expanded perlite with hexadecyltrimethylammonium-bromide and gallic acid for boron adsorption

Pelin Demircivi^{a*}, Gulhayat Nasun Saygili^b

^{a*}Yalova University, Chemical and Process Engineering Department, Yalova, Turkey
Tel: +902268155409; Fax: +902268155401; e-mail: pelindemircivi@gmail.com

^bIstanbul Technical University, Chemical Engineering Department, Istanbul, Turkey

ABSTRACT

Expanded perlite-based novel adsorbents for boron adsorption were evaluated by the modification with hexadecyltrimethylammonium bromide (HDTMA) and gallic acid (GA). The samples were characterized by XRD, SEM and FTIR analysis. The adsorption of boron was examined at different HDTMA/GA concentrations, solution pH, initial concentration, temperature and contact time. Inert electrolyte effect on boron adsorption was also investigated. The optimum pH was found between pH 7-9. At the optimum pH level, boron adsorption capacities of HDTMA-perlite and GA-perlite were calculated as 833 mg/g and 2500 mg/g, respectively. The adsorption kinetic data was best described by pseudo second-order kinetic model for both HDTMA-perlite and GA-perlite samples. The adsorption process was found to be endothermic, and positive entropy values the increase of randomness at solid/liquid interface.

Keywords: Boron, Batch adsorption, HDTMA, Gallic acid, Perlite

1. Introduction

Although, boron exists naturally in environment, it is also released to environment by industrial discharge. Boron mines and boric acid plants are the main sources for the boron pollution [1]. Besides, boric acid and boron salts have widely used in the

Download English Version:

<https://daneshyari.com/en/article/7843101>

Download Persian Version:

<https://daneshyari.com/article/7843101>

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