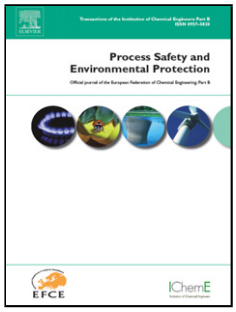
Accepted Manuscript



Title: A review on graphene oxide and its composites preparation and their use for the removal of $As^{3+}$and As^{5+} from water under the effect of various parameters: Application of isotherm, kinetic and thermodynamics

Authors: Sharf Ilahi Siddiqui, Saif Ali Chaudhry

PII: S0957-5820(18)30567-6
DOI: https://doi.org/10.1016/j.psep.2018.07.020
Reference: PSEP 1464

To appear in: *Process Safety and Environment Protection*

Received date: 31-3-2018
Revised date: 4-7-2018
Accepted date: 20-7-2018

Please cite this article as: Siddiqui SI, Chaudhry SA, A review on graphene oxide and its composites preparation and their use for the removal of $As^{3+}$and As^{5+} from water under the effect of various parameters: Application of isotherm, kinetic and thermodynamics, *Process Safety and Environmental Protection* (2018), https://doi.org/10.1016/j.psep.2018.07.020

A review on graphene oxide and its composites preparation and their use for the removal of $As^{3+}$and As^{5+} from water under the effect of various parameters: Application of isotherm, kinetic and thermodynamics

Sharf Ilahi Siddiqui and Saif Ali Chaudhry*

Environmental Chemistry Research Laboratory, Department of Chemistry, Jamia Millia Islamia, New Delhi 110025, India

*Email: saifchaudhary09@gmail.com
Contact No: +917827092932

High level exposure of arsenic through water is a calamity for developing countries and is associated with diabetes, hypertension, neurological arteriosclerosis, cardiovascular and cancer along with others severe diseases. The removal of arsenic has become urgent but most of the treatment technologies are costly except adsorption which is inexpensive, simple and safe to handle. Graphene oxide and its composite based membranes, thin films, paper-like materials, and solid composite materials have got attention for water treatment. Because of the unique physicochemical characteristics, magnetic character, oxidizing ability, and structural defects, graphene oxide and its composite provide an advantage for arsenic treatment. This review summarizes the arsenic treatment application of graphene oxide and graphene oxide based materials with selected examples, mostly from the latest literature. The ideas of preparation, characterization of graphene oxide and its composite using fourier-transform infrared spectroscopy, Raman spectroscopy, X-ray diffraction spectroscopy, X-ray photoelectron spectroscopy, scanning electron microscopy, transmission electron microscopy, thermogravimetric analysis and vibrating-sample magnetometer, has been explored in detail. Batch studies of graphene oxide and its based materials for arsenic removal from water have been highlighted in terms of affecting parameters. The adsorption affinity and mechanism have