

## Accepted Manuscript

Optimization of effective parameters in the synthesis of nanopore anodic aluminum oxide membrane and arsenic removal by prepared magnetic iron oxide nanoparticles in anodic aluminum oxide membrane via ultrasonic-hydrothermal method

Akram Maghsodi, Laleh Adlnasab, Meisam Shabanian, Mehran Javanbakht

PII: S1350-4177(18)30395-X  
DOI: <https://doi.org/10.1016/j.ultsonch.2018.07.003>  
Reference: ULTSON 4220

To appear in: *Ultrasonics Sonochemistry*

Received Date: 10 March 2018  
Revised Date: 1 July 2018  
Accepted Date: 3 July 2018

Please cite this article as: A. Maghsodi, L. Adlnasab, M. Shabanian, M. Javanbakht, Optimization of effective parameters in the synthesis of nanopore anodic aluminum oxide membrane and arsenic removal by prepared magnetic iron oxide nanoparticles in anodic aluminum oxide membrane via ultrasonic-hydrothermal method, *Ultrasonics Sonochemistry* (2018), doi: <https://doi.org/10.1016/j.ultsonch.2018.07.003>

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.



# Optimization of effective parameters in the synthesis of nanopore anodic aluminum oxide membrane and arsenic removal by prepared magnetic iron oxide nanoparticles in anodic aluminum oxide membrane via ultrasonic-hydrothermal method

Akram Maghsodi<sup>1</sup>, Laleh Adlnasab<sup>1\*</sup>, Meisam Shabani<sup>2</sup>, Mehran Javanbakht<sup>3</sup>

<sup>1</sup>Department of chemistry, Faculty of Chemistry and Petrochemical Engineering, Standard Research Institute, P.O. Box: 31745-139, Karaj, Iran

<sup>2</sup>Department of Petrochemical and Polymer, Faculty of Chemistry and Petrochemical Engineering, Standard Research Institute, P.O. Box: 31745-139, Karaj, Iran

<sup>3</sup> Department of Chemistry, Amirkabir University of Technology, Tehran, Iran

## Abstract

In this study, a new anodized aluminum oxide (AAO) nanostructure membrane was synthesized by anodization process under a constant voltage, in oxalic acid solution that was improved with trace amounts of sulfuric acid at room temperature. The effect of various parameters on the morphology of the synthesized nanostructures such as voltage, electrolyte composition, anodization time and type of stripping solution were investigated. According to the results, corrosion of the walls, size regularity, diameter and number of the pores increased in the presence of sulfuric acid ( $0.018 \text{ mol.L}^{-1}$ ). Nitrogen adsorption-desorption analysis confirmed significant porosity, array and uniformity of the pore size in the synthesized nanoporous membrane. A new modification method was used based on ultrasonic-hydrothermal method to modify the synthesized AAO with  $\text{Fe}_3\text{O}_4/\text{SiO}_2$  nanoparticles for metals and metalloids removal from aqueous solution. In this method,  $\text{Fe}_3\text{O}_4/\text{SiO}_2$  nanoparticles were placed very regularly and uniformly on the surface and inside the pores. This modification was confirmed by

Download English Version:

<https://daneshyari.com/en/article/7702254>

Download Persian Version:

<https://daneshyari.com/article/7702254>

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