

Accepted Manuscript

Highly efficient removal of fluoride from aqueous media through polymer composite membranes

J. Nunes-Pereira, R. Lima, G. Choudhary, P.R. Sharma, S. Ferdov, G. Botelho, R.K. Sharma, S. Lanceros-Méndez

PII: S1383-5866(17)34213-2
DOI: <https://doi.org/10.1016/j.seppur.2018.05.015>
Reference: SEPPUR 14599

To appear in: *Separation and Purification Technology*

Received Date: 22 December 2017
Revised Date: 7 May 2018
Accepted Date: 7 May 2018

Please cite this article as: J. Nunes-Pereira, R. Lima, G. Choudhary, P.R. Sharma, S. Ferdov, G. Botelho, R.K. Sharma, S. Lanceros-Méndez, Highly efficient removal of fluoride from aqueous media through polymer composite membranes, *Separation and Purification Technology* (2018), doi: <https://doi.org/10.1016/j.seppur.2018.05.015>

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.



Highly efficient removal of fluoride from aqueous media through polymer composite membranes

J. Nunes-Pereira^{a, b, c, *}, R. Lima^b, G. Choudhary^d, P. R. Sharma^d, S. Ferdov^b,
G. Botelho^c, R. K. Sharma^d and S. Lanceros-Méndez^{f, g, *}

^a Centre for Mechanical and Aerospace Science and Technologies (C-MAST-UBI),
Universidade da Beira Interior, Rua Marquês d'Ávila e Bolama, 6201-001 Covilhã,
Portugal

^b Centro de Física, Universidade do Minho, 4710-057 Braga, Portugal

^c IB-S – Institute of Science and Innovation for Bio-Sustainability, University of Minho,
4710-057, Braga, Portugal

^d Department of Chemistry, Indian Institute of Technology, Jodhpur, Rajasthan, India

^e Centro de Química, Universidade do Minho, 4710-057, Braga, Portugal

^f BCMaterials, Basque Centre for Materials, Applications and Nanostructures,
UPV/EHU Science Park, 48940 Leioa, Spain

^g IKERBASQUE, Basque Foundation for Science, 48013, Bilbao, Spain

Abstract

Different aluminum and calcium based particles, montmorillonite (MMT), zeolites (NaY), bayerite (BAY) and hydroxyapatite (CaHAp), were compared and evaluated for water defluorination. The effect of parameters such as temperature of the medium, concentration (mass of adsorbent), reaction time and pH on the defluorination capacity were studied for the particles with best performance. MMT and CaHAp adsorbents showed increased fluoride rejections in batch experiments (≈ 45 and 100 %). The defluorination capacity of MMT is influenced by the concentration and pH, while for CaHAp is independent of the evaluated parameters within the measured range. Further, polymer composite membranes based on poly(vinylidene fluoride-hexafluoropropylene) (PVDF-HFP) and the adsorbents with higher defluorination capacity were prepared by thermally induced phase separation in order to produce active filters for fluoride removal from water. The composite membranes presented a homogeneous porous structure with degrees of porosity ranging between ≈ 20 and 76 % and average pore size in the micron range. The permeability of the composite membranes ranged between

Download English Version:

<https://daneshyari.com/en/article/7043605>

Download Persian Version:

<https://daneshyari.com/article/7043605>

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