Desalination and Water Treatment
www.deswater.com

doi: 10.1080/19443994.2015.1044914

57 (2016) 11782–11788
May

Taylor & Francis
Taylor & Francis Group

Application of nanofilter in removal of phosphate, fluoride and nitrite from groundwater

Nader Yousefi[a], Ali Fatehizedeh[b], Kamal Ghadiri[a], Nezam Mirzaei[a], Seyed Davoud Ashrafi[a], Amir Hossein Mahvi[a,c,d,*]

[a]*Department of Environmental Health Engineering, School of Public Health, Tehran University of Medical Sciences, Tehran, Iran, Tel. +00982188954914; emails: yousefinader@gmail.com (N. Yousefi), kamalgh2005@gmail.com (K. Ghadiri), nezammirzaei@yahoo.com (N. Mirzaei), d_ashrafi@yahoo.com (S.D. Ashrafi), Tel. +00982188954914; Fax: +0098216462267; email: ahmahvi@yahoo.com (A.H. Mahvi)*
[b]*Department of Environmental Health Engineering, School of Public Health, Isfahan University of Medical Sciences, Isfahan, Iran, email: fatehizadeh@gmail.com (A. Fatehizedeh)*
[c]*Center for Solid Waste Research, Institute for Environmental Research, Tehran University of Medical Science, Tehran, Iran*
[d]*National Institute of Health Research, Tehran University of Medical Sciences, Tehran, Iran*

Received 13 July 2014; Accepted 18 April 2015

ABSTRACT

At present, nanofiltration (NF) technologies find the ever greater use in the water industry, particularly, drinking water supplies. The concentrations of most anions in the groundwater sources are much higher than surface water and in some cases are higher than drinking water standards. In this regard, the aim of this study was to investigate the possibility of application of nanofilters in removing phosphate, fluoride, and nitrite from aqueous solutions. In this research, the effect of different factors including initial concentrations of nitrate, phosphate, and fluoride along with the flow rate were investigated. The results showed that with an increase in the initial concentrations of phosphate, fluoride, and nitrite, along with an increase in flow rate, the removal efficiencies decreased. The maximum removal efficiencies for phosphate, fluoride, and nitrite were 98, 82, and 87%, respectively. According to the findings, NF membrane could be recommended for removing nitrates, fluoride, and phosphate from aqueous solutions.

Keywords: Nanofiltration; Eutrophication; Fluorosis; Blue baby; Groundwater

*Corresponding author.