

Application of Nano Technology in Purifying Water

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Abstract

In this work, the methods of filtration water such as controlling the size of pores and integrating nanocarbon membrane filtration with electropolarization using an electroconductive nanocarbon-based were investigated. The consequence exposed that carbon nanotubes array (CNTA (6,6,5)) with about 60 (molecule/tube.ns) of water flux and 100% of salt rejection has high-efficiency on desalination procedures and driving the most water flux amounts for filtering was achieved. Also for the condition under alternatively polarization (between $\pm 1V$) furnished a high amount of water flux for removing pollutions from water by membrane fouling. So by combining these approaches, an effectual avenue for water treatment will open.

Keywords: Desalination, Nanocarbon, Membrane filtration, Controlling interval, Polarization

1. Introduction

About 70% of the Earth has been made of water and nearly 800 million people can't live without it. With this promising numbers, it seems to be fine for human society not to be concern about it. Unfortunately, most of this amount water is in icy mood or consist on seawaters which these people would not be able to utilize for drinking and by increasing the population the waster of water got to the high level which the amount would be vanished [1,2].

So the requirement of water cause manufacture equipment which can be useful in process of water treatment. In this years, discovering many methods in Nano-Technology's field solve this big challenge of the current era. In this field, nanotube and nanopore have illustrated their approval application in water treatment. There are filtration materials made of a sheet of nanoporous graphene which blocks salt ions while letting water molecules through. These sheets form of carbon are called Multiwalled Carbon Nanotube (MWCNT) have many types of methods.

The controlling interval of this sheets is one of them which have an extraordinary effect on purifying seawaters. As shown in Fig. 1, by changing the distance between adjacent sheets

the procedure of purifying can improve the status of desalination.

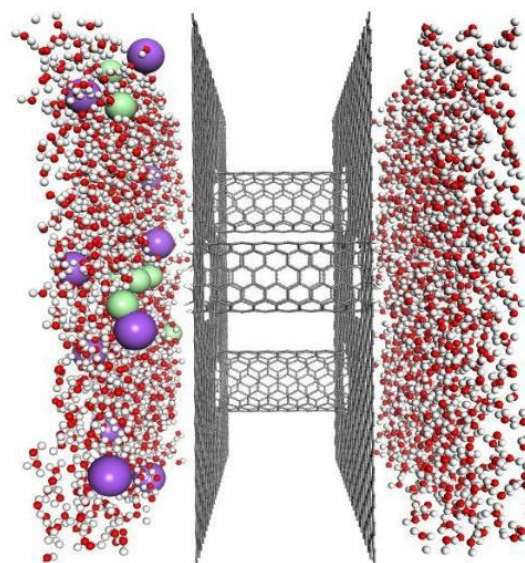


Fig. 1. MWCNT membrane with two graphene sheets which have the most efficient in purifying water.

Integrating nanocarbon membrane filtration with electric field for driving effective membrane fouling mitigation is another method of desalination which has just entered the Nano-Technology market and competes with other methods. In this approach, there is a electropolarized membrane (EM) which can alternate square-wave potentials among ± 1 volt with 60 second pulse width illustrated a