Revolutionary Desalination System

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alter the efficiency and cost which are precondition challenges for sustainability outgrowth.We hypothesized that using kaolin to remove heavy metals and organic compounds, functionalized metal-oxy-hydroxide hybrid membrane to remove bacteria and viruses and highly-advanced well-dispersed and geometrically-modified Carbon-Nano-tubes(CNT)for salt-rejection is a novel solution for this dilemma. Herein, we introduce a novel chemically-treated kaolinite, synthesized, functionalized aluminum/iron-oxy-hydroxide Nanofibers. They were dip-coated for surface modification of Nylon-6 membrane. Extraordinarily,CNT were functionalized, well-dispersed into non-covalent BF-a-benzoxazine-acid modified to be vertically-aligned-CNT. Incredibly, the system resulted in;98.5% heavy metal removal,97% salt rejection,99.8%biological contaminant removal costing only 60$ and 9.7 bar as a feed pressure that's 20% of the pressure used in current desalination plants. Results show the drinkability of water produced by our system according to WHO standards. The feasibility of the project was studied on the large scale and the profit was 710,000,000$/year with 0.36$/m3 that's nearly one-third of the price offered by current desalination techniques concluding the remarkable success of our hypothesis using novel engineered Nano materials. . Many tests such as X-ray-diffraction(XRD),Scanning-Electron-Microscopy(SEM),Transmission-electron-microscopy(TEM) were performed to characterize the products. The implementation of this system holds the promise in a wide range of applications such as securing potable water for domestic, agriculture and industrial use. The heavy metals can be desorbed and reused in(chemical, medical, detergent,..) industries and nuclear stations adding more value to the system.

Awards Won:

Fourth Award of $500