AN APPROACH TO MEMBRANE PROCESS OPTION FOR REMOVAL OF FLUORIDE FROM DRINKING WATERS

A Jafari,[a,*] AH Mahvi,[a] S Nasseri,[a, b] R Rezaee,[c] R Davoodi[d]
Tehran, Sanandaj, and Kermanshah, Iran

SUMMARY: **This paper discusses the trends in the use of membranes in water treatment and, in particular, for the removal of fluoride (F). Membrane, along with the adsorption process, is considered to be an effective process for the rejection of various pollutants, including F. The benefit of membrane, over other effective processes, such as adsorption, is that pathogens, parasites, and other pollutants can be removed simultaneously. In addition, the control of the breakpoint in the adsorption process requires continuous monitoring of the water quality and special equipment for F measurement. Although the point of use (POU) application of domestic reverse osmosis (RO) and nanofiltration (NF) are growing in some regions, they require considerable knowledge about how to use and operate the manufactured material. The availability of energy is also an obstacle to the widespread use of membrane, although an official committee or authority can easily help families with the preparation of small devices. Other abundant energy sources, such as solar and wind power, may be able to assist with the development of the application of membranes in remote areas to purify water with high F and total dissolved solids (TDS). In general, economic analysis has shown that F removal using membrane can be affordable for some communities.**

Key words: Fluoride mitigation; Membrane process; Nanofiltration; Reverse osmosis.

[a]Department of Environmental Health Engineering, School of Public Health, Tehran University of Medical Sciences, Tehran, Iran; [b]Center for Water Quality Research (CWQR), Institute for Environmental Research (IER), Tehran University of Medical Sciences, Tehran, Iran; [c]Kurdistan Environmental Health Research Center, Kurdistan University of Medical Sciences, Sanandaj, Iran; Kermanshah Water and Wastewater Company, Kermanshah, Iran;
*For correspondence: Ali Jafari, Department of Environmental Health Engineering, School of Public Health, Tehran University of Medical Sciences, Tehran, Iran; E-mail: Jafari_a99@yahoo.com;