ABSTRACT

The aquifer of the Tula Valley in Mexico is recharged by the infiltration of wastewater used for agricultural irrigation. This aquifer is considered to be a possible source of water for Mexico City, and although, in general, the water is good quality it still contains hardness and specific emerging pollutants. This research aims to identify a suitable treatment process based on membrane nanofiltration as it is a proven technology. Four nanofiltration membranes were compared using the critical flux concept in order to select the two that produced the largest amount of permeate. Membrane fouling was assessed by investigating the deposition of calcium using SEM images. To control hardness scaling, pretreatment with 150% of lime was employed. Finally, one membrane was selected based on its capability to remove carbamazepine, bisphenol A, triclosan, butilbenzylphthalate, and 4-nonylphenol. The selected membrane was operated at 800 kPa, producing 87.30 l m⁻² h⁻¹.

Keywords: Critical flux; Drinking water; Fouling; Nanofiltration; Unintentional water reuse; Emerging pollutants