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Materials

Removal of emerging contaminants (PhACs) in water by polymer membranes

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Maria C.B.S.M. Montenegro^a

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Human activity and population growth have led to the increase of pollutants in surface waters. Among the main pollutants are the active pharmaceutical compounds (PhACs). These have been detected in effluents from wastewater treatment plants (WWTP), demonstrating resistance to elimination by conventional treatments. In this way concentrations of these compounds that could be toxic and cause harmful effects on human health and aquatic species can reach the freshwater bodies and domestic networks (1). The membrane filtration processes stand out as promising alternatives for the final quality of the water, easy operation, low costs and less space required. The polysulfone membranes (PSU) have been used in microfiltration and ultrafiltration processes due to their physical-chemical resistance and thermal stability. However, its main disadvantage is fouling of the membrane due to its hydrophobic nature, which decreases the permeate flow over time. To counteract this problem additives are incorporated in the membrane to improve its hydrophilic character (2). The objective of this work is to study the effect of the presence and concentration levels of PSU, polyvinylpyrrolidone (PVP) and polyethylene glycol (PEG) on the hydrophilic characteristics of the membranes. The influence of the molecular weight of the PVP and PEG additives separately on the performance of the membranes will also be evaluated. In the future, the incorporation into the membrane of chelating chemical compounds will be evaluated for the removal of different compounds, in particular non-steroidal anti-inflammatory drugs (NSAIDs), in waters for domestic consumption.

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