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### Evaluation of the ppm-h concept for end-of-life RO membrane into recycled NF and UF membranes

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Thin Film Composite polyamide membranes have been worldwide used in desalination and water recycling plants. However, once their lifespan is exhausted they are often disposed into the landfills which are the last priority according to the main pyramidal waste management principles of the European Directive 2008/98/EC on waste (prevention, preparing for re-use, recycling, recovery and disposal). The present study, as part of the LIFE+ ENV/ES/000751 TRANSFOMEM European project, investigates the transformation of end-of-life membranes that were treating brackish water or seawater to be recycled as nanofiltration (NF) and ultrafiltration (UF) membranes. Such process is a simple, low energy, surface modification technique based on polyamide chemical attack by free chlorine. The ppm-h concept it was evaluated which implies different exposure times of end-of-life membranes at diverse concentrations of sodium hypochlorite (NaOCl) solutions. All the transformation experiments were carried out at alkaline conditions ( $\text{pH} > 10$ ) at room temperature and without stirring. Two different exposure doses were set in order to obtain nanofiltration and ultrafiltration membrane performances. The membrane performances were evaluated filtering synthetic brackish water containing NaCl,  $\text{MgSO}_4$  and dextrose. The surface properties of the transformed membranes were also analyzed by scanning electron microscopy (SEM) and attenuated total reflection-Fourier Transform Infrared (ATR-FTIR). Results showed that ppm-h concept is not valid for all cases.

#### Biography

Raquel Garcia Pacheco completed her project Master's degree in Hydrology and Water Resources (UAH-URJC, Madrid, 2010-2011) and the degree in Chemical Engineering (URJC, Madrid, 2003-2008). She is currently conducting her PhD studies about recycling and reuse of end-of-life membranes at IMDEA WATER. She has published as a co-author 5 scientific papers (2 in reputed journals) and is currently writing 2 papers as first author. She has also published 3 book chapters and has 8 congress presentations. She has participated at CONSOLIDER TRAGUA Project (2009-2012) and in the Yolanda's Typhon emergency (treating water operation with ERU WATSAN of Spanish Red Cross). Currently she participates in the REMTAVARES Project (2010-2017) and is the Technical responsible of the LIFE ENV/ES/000751 TRANSFOMEM Project (2014-2018).

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