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Improved flux and anti-biofouling performances of reverse osmosis membrane via surface layer-by-layer assembly

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Abstract

Thin film composite (TFC) polyamide reverse osmosis (RO) membranes are naturally prone to fouling, especially the biofouling, due to their inherent physicochemical surface properties. In the current study, highly efficient anti-biofouling membrane was fabricated by assembly of poly acrylic acid and potent anti-microbial agent tobramycin on a commercial TFC RO membrane surface using the layer-by-layer technique. The successful modification was verified by XPS, and the membrane surface hydrophilicity was substantially improved as detected by contact angle measurement. Membrane prepared under optimized condition shows 18% increased water flux and slightly enhanced (0.4%) salt rejection properties. The antifouling performance is significantly improved, as the modified membrane demonstrates 37% and 26% higher flux than the virgin membrane after three-cycling

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