

Preparation and characterization of poly(vinyl alcohol)-sulfonated graphene oxide thin film composite as forward osmosis membrane

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Forward osmosis (FO) is considered energy-efficient since this is an osmotic pressure-driven process. However, membrane fabrication is one area that hampers the implementation of FO as a leading desalination technology. Herein, the thin layer composite, TFC FO membrane performance was enhanced by modifying its structural make-up by incorporating a hydrophilic nanoparticle (sulfonated graphene oxide, sGO) to the support layer (polyvinyl alcohol, PVA). On this support, the active polyamide (PA) layer was formed through interfacial polymerization to form TFC FO membrane. Results showed that the inherent hydrophilicity of PVA and mechanical strength were enhanced as sGO was incorporated to the PVA. Modified PVA TFC FO membrane exhibited higher water flux with moderate J_s/J_v value compared to pristine PVA membrane. This work was supported by the National Research Foundation of Korea funded by the Ministry of Science and ICT (No. 2016R1A2B1009221 and No. 2017R1A2B2002109), and the Ministry of Education (No. 2009-0093816).