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Abstract

Thin film nanocomposite (TFN) membranes incorporated with graphene quantum dots (GQDs) were fabricated with enhanced water permeability and antifouling property. Owing to the small size, stable dispersion and active functional groups, GQDs were embedded into polyamide (PA) layer during the interfacial polymerization of piperazine (PIP) and trimesoyl chloride (TMC) in a facile way. The surface chemical features and morphologies of the resultant TFN membranes were characterized by Fourier transform infrared (FTIR) spectroscopy, X-ray photoelectron spectroscopy (XPS), water contact angle, zeta potential, scanning electron microscope (SEM) and atomic force microscopy (AFM) measurements. The surface roughness of the TFN membranes decreased and the surface hydrophilicity of the TFN membranes enhanced with the increase of the GQDs content. According to nanofiltration (NF) experiments, the highest water flux of the TFN membranes reached