

Titanium isopropoxide combined amphiphilic graft copolymer membrane for ultrafiltration

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Hybrid membrane of amphiphilic graft copolymer poly(vinyl chloride)-g-poly(oxyethylene methacrylate) (PVC-g-POEM) and titanium isopropoxide (TTIP) is fabricated for ultrafiltration water treatment. With the addition of TTIP, the surface pore size and surface porosity increased, resulting in improved water permeance. Self-assembly of TTIP with the POEM side chains induced well-organized structure with high porosity and high water content, which enhanced antifouling properties of the membranes. Treatment in 80 °C water enhanced both BSA rejection and flux ratio recovery (FRR) value, attributed by accelerated dissolution of TTIP. The PVC-g-POEM/TTIP membrane prepared at 25 °C shows the best performance, reaching 338 L m⁻² h⁻¹ bar⁻¹ (LMH) water permeance, 89.4 % BSA rejection, and 91.9 % FRR.