

The effect of nanomaterials on the biofouling alleviation polymeric membranes

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Global water scarcity caused by increasing densely populated and industrialized regions. Henceforth, membrane-based purification plant installations meaningfully enlarged worldwide. However, one of the crucial challenges in any membrane process is fouling which has different types of organic and colloidal fouling, scaling, and biofouling. Flux and antifouling properties of mixed matrix membranes (MMM) are yet to attain satisfactory status. While, the issue of biofouling can be minimized or removed via operating conditions optimization, feed pretreatment and hydraulic and chemical cleaning,

these techniques often increase the total operational cost of the membranes as well as shorten their lifetime. Recently, the development of new materials or the surface modification of current membrane to make them less prone to fouling has become a point of interest for both researchers and industry. The aim of this study is mitigating the biofouling of polyethersulfone (PES) ultrafiltration (UF) membranes via blending of thermoexfoliated vermiculite (VMT) and mesoporous carbon nanoparticles (MCN).

Keywords: Antibacterial; biofouling; mesoporous carbon; mixed matrix membrane; vermiculite