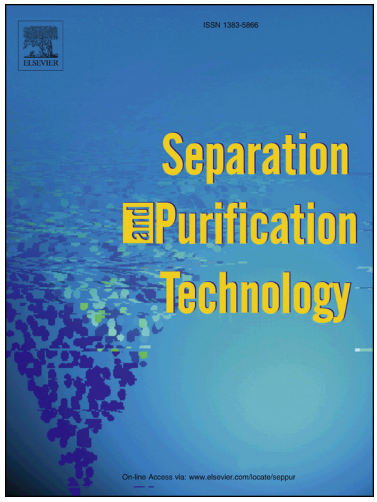

Antimicrobial three dimensional woven filters containing silver nanoparticle doped nanofibers in a membrane bioreactor for wastewater treatment

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Abstract

Antimicrobial three dimensional (3D) woven fabric filters are fabricated by wrapping the weft yarn with electrospun nanofibers containing 2 wt.% silver nanoparticles (AgNPs). For comparison, 3D fabrics with the same structure composed of commercial antimicrobial yarns containing Ag ion and control yarns of the same types are also fabricated. The disk diffusion test shows that the fabric and the yarns with AgNPs nanofibers and Ag ions suppress the growth of bacterial colonies. A long term filtration performance test show that the fabric filter containing AgNPs has 40 – 50% higher fluxes and substantially larger flux recovery proportions than those of the corresponding control filter. The scanning electron microscopy and confocal laser