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Hybrid nanofibers of TiO₂-silicone and TiO₂-Ag-silicone for high water flux photocatalytic degradation of dairy effluent

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Abstract

TiO₂ and TiO₂-Ag nanofibers were produced by electrospinning technique and surface coated on silicone elastomer discs (diameter: 10.0 mm; thickness: 2.0 mm) by dipcoating method. The coated discs were characterized by various morphological and physicochemical techniques (like SEM, TEM, XRD, FTIR, EDS and UV). These characterizations reveal that the surface morphology of electrospun nanofibers remain intact by the dipcoating technique. The produced TiO₂- and TiO₂-Ag silicone discs were utilized as photocatalysts to degrade dairy waste water with an efficient water flux and water photosplitting properties.

Key Words: Silicone Elastomer; Electrospinning; Silver titanium nanomaterials; Dairy effluent; Water Flux; Photodegradation; Water Photosplitting