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

Muzafar A. Kanjwal^{a,*}, Martin Almb, Peter Thomsen^b, Nasser A.M. Barakat^c, Ioannis S. Chronakis^{a, **}

^aNano-BioScience Research Group, DTU-Food Technical University of Denmark, , Soltofts plads, B 227, 2800 Kgs. Lyngby, Denmark

^bBioModics ApS, Gregersensvej 7, DK-2630 Taastrup, Denmark

^cDepartment of Textile Engineering, Chonbuk National University, Jeonju 561-756, Republic of Korea

* Corresponding author. Tel.: (+45 45254941) E-mail addresses: muka@food.dtu.dk (M.A. Kanjwal),

** Corresponding author. Tel.: (+45 40206413) E-mail addresses: ioach@food.dtu.dk (I.S. Chronakis),

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