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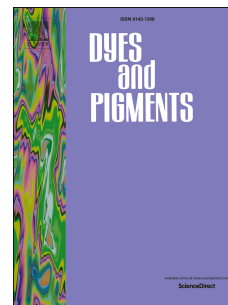
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Photoactive Cotton Fabric: Synthesis, Characterization and Antibacterial Evaluation of Anthraquinone-Based Dyes Linked to Cellulose

Vinícius Cardoso^a, Tiago Rittmeyer^a, Rodrigo J. Correa^{a,*}, Gabriela Coelho Brêda^b, Rodrigo Volcan Almeida^b, Grazieli Simões^c, Bruna M. de França^a, Priscila N. de Azevedo^a, Josué S. Bello Forero^{a,**}

^a Laboratório de Fotoquímica David E. Nicodem, Instituto de Química, Universidade Federal do Rio de Janeiro, CT, Bloco A, Cidade Universitária – Ilha do Fundão, CEP 21941-909, Rio de Janeiro- RJ, Brazil.

^b Laboratório de Microbiologia Molecular e Proteínas, Instituto de Química, Universidade Federal do Rio de Janeiro, Cidade Universitária – Ilha do Fundão, CEP 21941-909, Rio de Janeiro- RJ, Brazil.

^c Laboratório de Espectroscopia de Fotoelétrons, Instituto de Química, Universidade Federal do Rio de Janeiro, Bloco A – Sala 402, Centro de Tecnologia, Cidade Universitária, Rio de Janeiro- RJ, Brazil.

* Corresponding author

** Corresponding author

E-mail addresses: jsbforero@gmail.com (J.S.B. Forero), rodrigojosecorrea@gmail.com (R.J. Correa)

ABSTRACT

In the present work, we report a facile and low-cost method for the preparation of cotton fabric, covalently linked to three anthraquinonic (ANQs) dyes, as efficient cellulosic material with antimicrobial properties under visible light irradiation. The modified cotton fabrics were characterized by infrared (FTIR), diffuse reflectance UV-Vis spectroscopy (DRUV), thermogravimetric analysis (TGA), scanning electron microscope (SEM) and X-ray photoelectron spectroscopy (XPS) techniques, in order to confirm the linkage between ANQs and cellulosic fibers. The antimicrobial activity of modified cotton fibres was evaluated under irradiation (400-800 nm) against *Escherichia coli*. The results showed the high bactericidal potential of materials with inhibition up to 99,9%. The self-cleaning phototoxic activity, due to the highly reactive singlet oxygen (1O_2), was confirmed by the characteristic phosphorescence emission of this transient in 1270 nm.

Keywords: Bactericidal, cotton fabric, anthraquinone, photosensitizer, singlet oxygen.

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