

Floating TiO₂-cork nano-photocatalysts for water purification using sunlight

Maria Leonor Matias¹, Maria Morais¹, Ana Pimentel¹, Francisco X. Vasconcelos¹, Ana S. Reis Machado², Joana Rodrigues³, Elvira Fortunato¹, Rodrigo Martins^{1*}, Daniela Nunes^{1*}

¹CENIMAT/i3N, Department of Materials Science, School of Science and Technology, NOVA University Lisbon and CEMOP/UNINOVA, 2829-516 Caparica, Portugal

²LAQV-REQUIMTE, Department of Chemistry, NOVA School of Science and Technology, Universidade NOVA de Lisboa, Campus de Caparica, 2829-516 Caparica, Portugal

³Physics Department & I3N, Aveiro University, Campus Universitário de Santiago, 3810-193 Aveiro, Portugal

Supplementary information

Figure S1 shows the Raman spectroscopy measurements of the cork substrates (pristine together with the functionalized one).

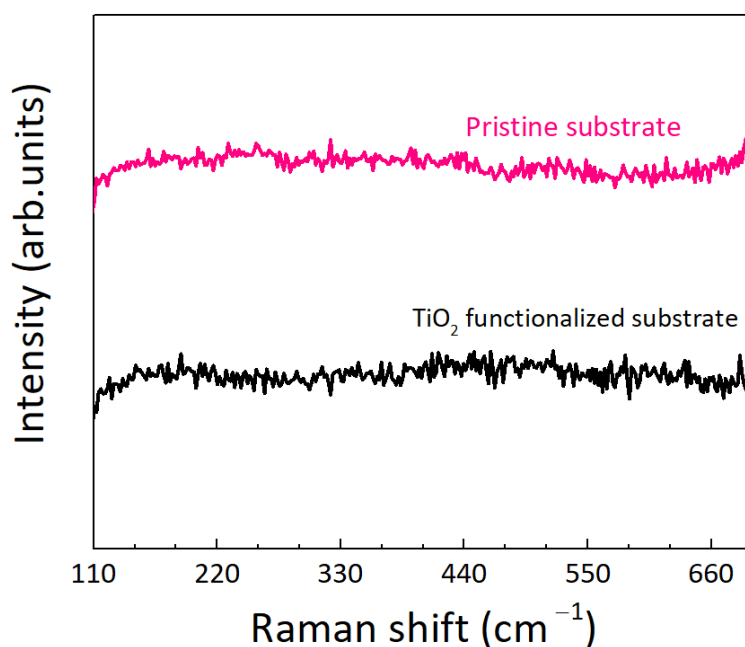


Figure S1

Figure S1 - Raman spectra of the cork substrates (pristine and TiO₂ functionalized one).

Figure S2 shows the absorption curve of the TiO₂ nanopowder synthesized in the absence of the cork substrates. The inset reveals the presence of very fine particles highly agglomerated.

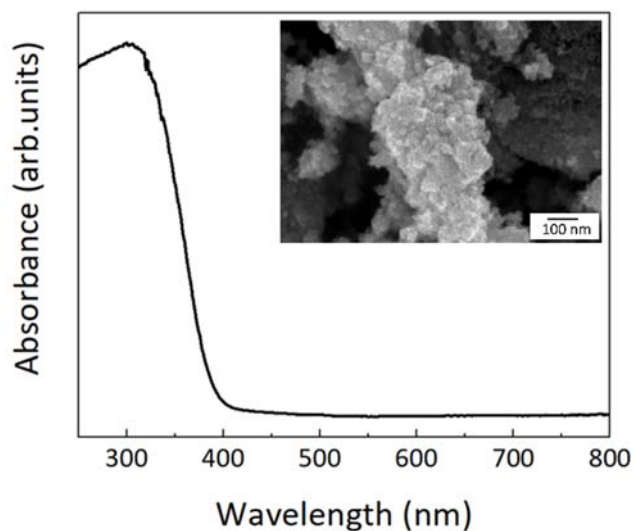


Figure S2 - Absorption curve of the synthesized TiO_2 nanopowder (in the absence of the cork substrates). The inset shows the SEM image of the TiO_2 nanopowder.

Figure S3 shows the EDS analysis of the cork substrates (pristine together with the functionalized one).

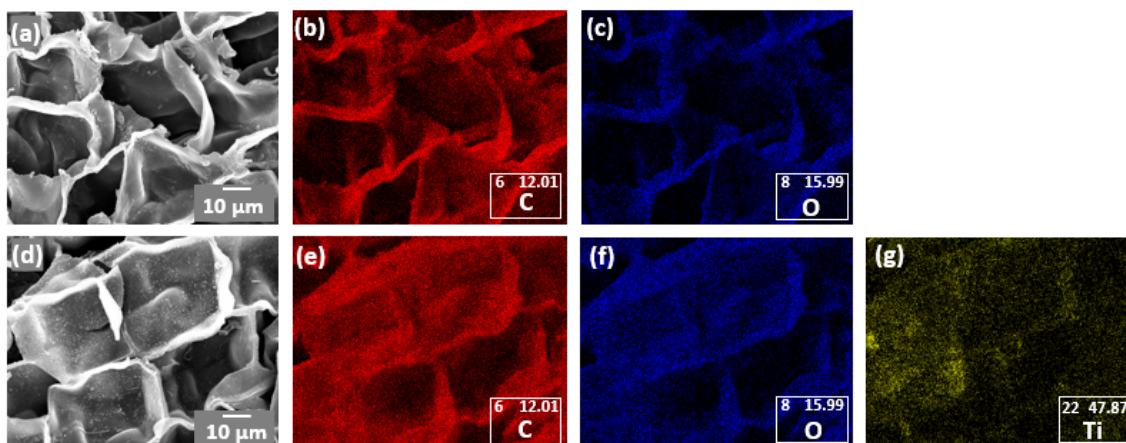


Figure S3 - SEM images of the cork substrates: (a) pristine substrate and (d) TiO_2 functionalized substrate. The corresponding EDS maps of C ((b) and (e)), O ((c) and (f)) and Ti (g) are also visible.

Figure S4 shows the prepared RhB dye solutions with the pristine and TiO_2 functionalized cork substrates during the photocatalytic experiments under natural sunlight. No-stirring or oxygenation were needed during the reactions. As visible, due to the floating characteristic of cork, the substrates can be easily collected from the solution without the need of complex experimental equipment.

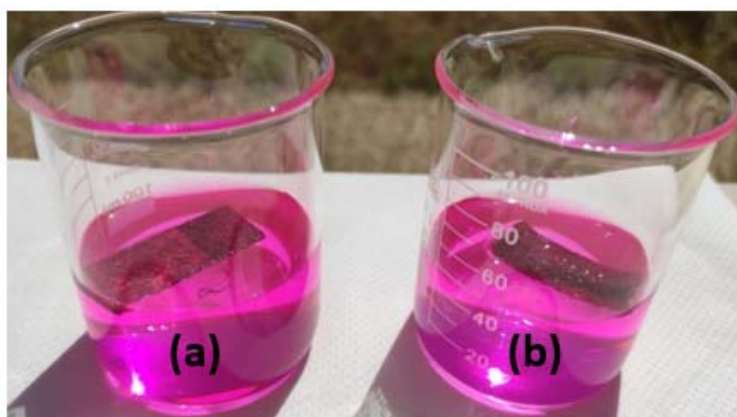


Figure S4 - Photocatalytic experiments with the cork substrates under natural sunlight: **(a)** pristine substrate and **(b)** TiO_2 functionalized substrate.

Figure S5 shows the comparison between the solar irradiance spectrum of the MiniSol model LSH-7320 and the reference AM 1.5.

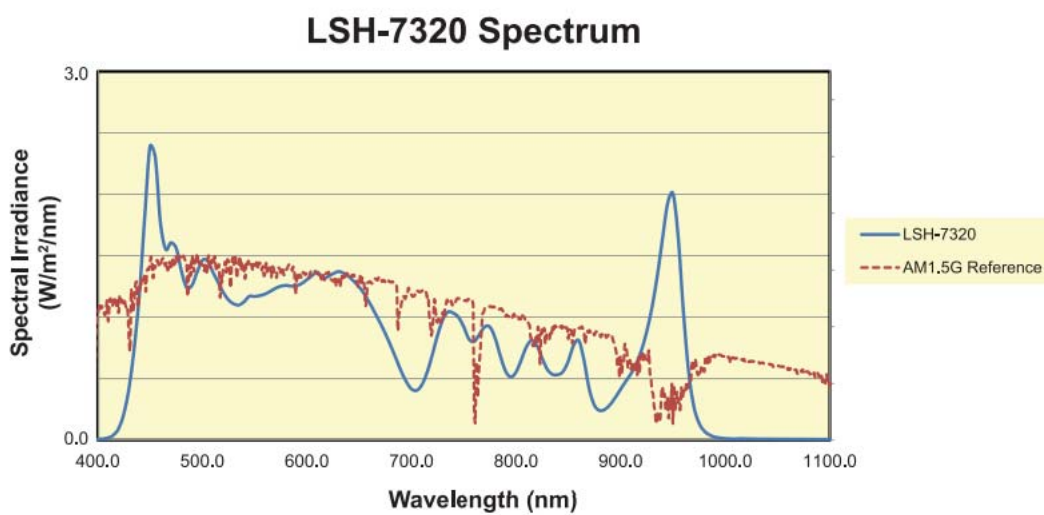


Figure S5 - Spectral irradiance versus wavelength (from 400 to 1100 nm) of the MiniSol model LSH-7320 and the reference AM 1.5.