

Supporting information

WETTABILITY, PHOTOACTIVITY AND ANTIMICROBIAL ACTIVITY OF GLAZED CERAMIC TILES COATED WITH TITANIA FILMS CONTAINING TUNGSTEN

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1. Emission spectra of the light sources employed for photocatalytic experiments

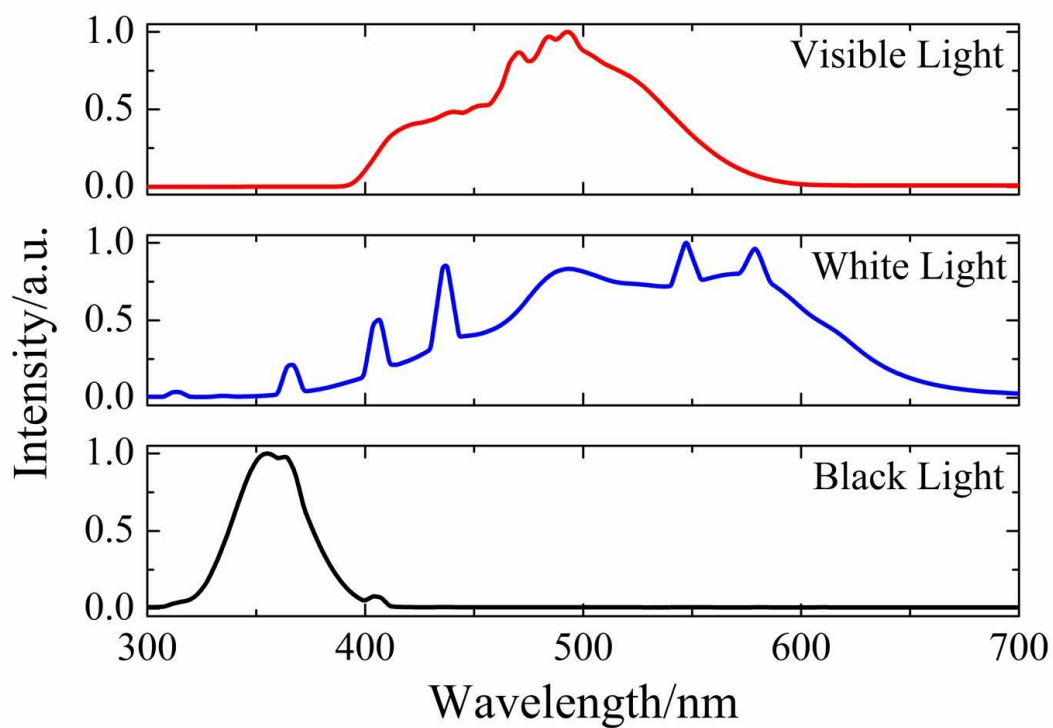


Figure S1. Emission spectra of *vis light* (Xenon Lamp with filters of copper (II) sulfate and polycarbonate), *white light* (Fluorescent Tube) and *black lighth* (UV Lamp).

2. Grain size histograms obtained from SEM images measurements.

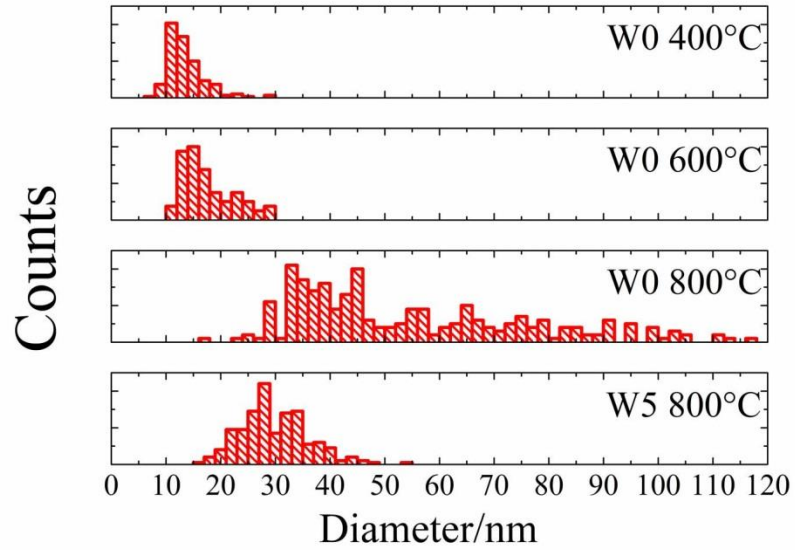


Figure S2. Grain size histograms for W0 annealed at 400°C, 600°C and 800°C; and W5 annealed at 800°C.

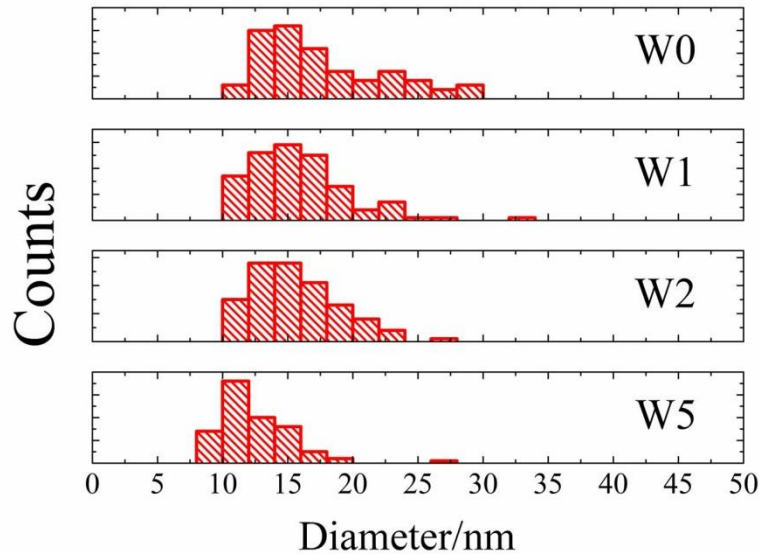


Figure S3. Grain size histogram of the W0, W1, W2 and W5 annealed at 600°C.

3. XPS spectra for W0 and W5 samples

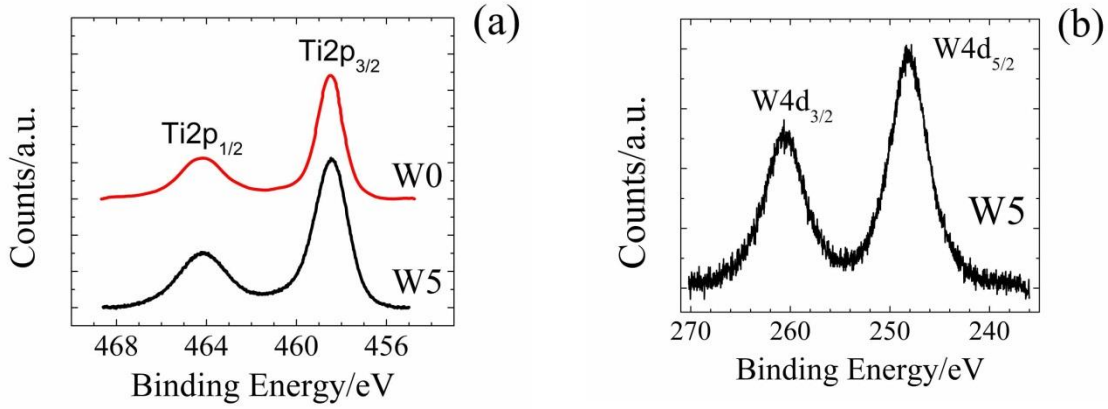


Figure S4. XPS spectra for Ti 2p (a) and W 4d (b) regions for the samples W0 and W5 annealed at 600°C.

4. Surface W/Ti ratio varying tungsten precursor.

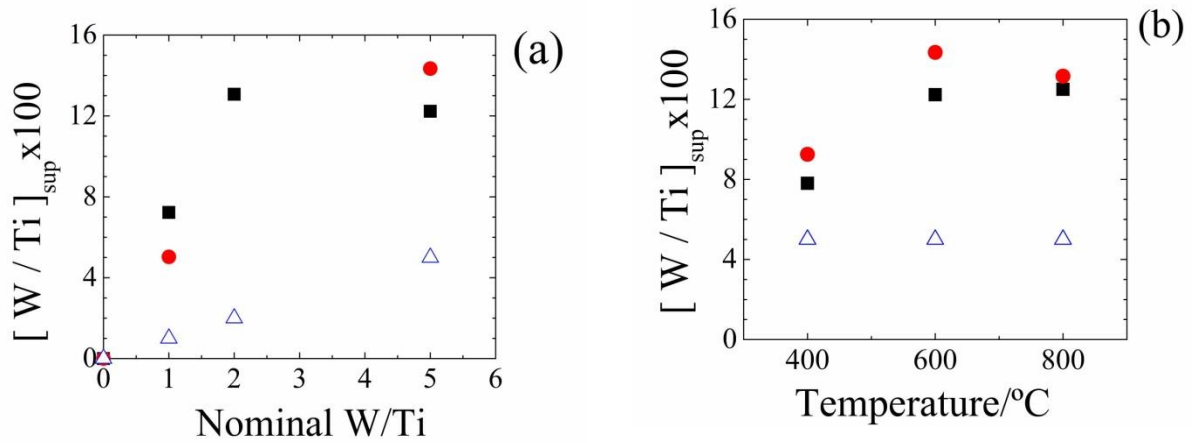


Figure S5. Surface W/Ti ratio varying tungsten precursor: ammonium metatungstate (squares) and tungsten ethoxide (circles). Dependence on (a) W/Ti nominal ratio and (b) annealing temperature for samples W5. The W/Ti Nominal is represented with triangles.

5. Crystal violet reflectance spectra for pristine TiO_2 and W5.

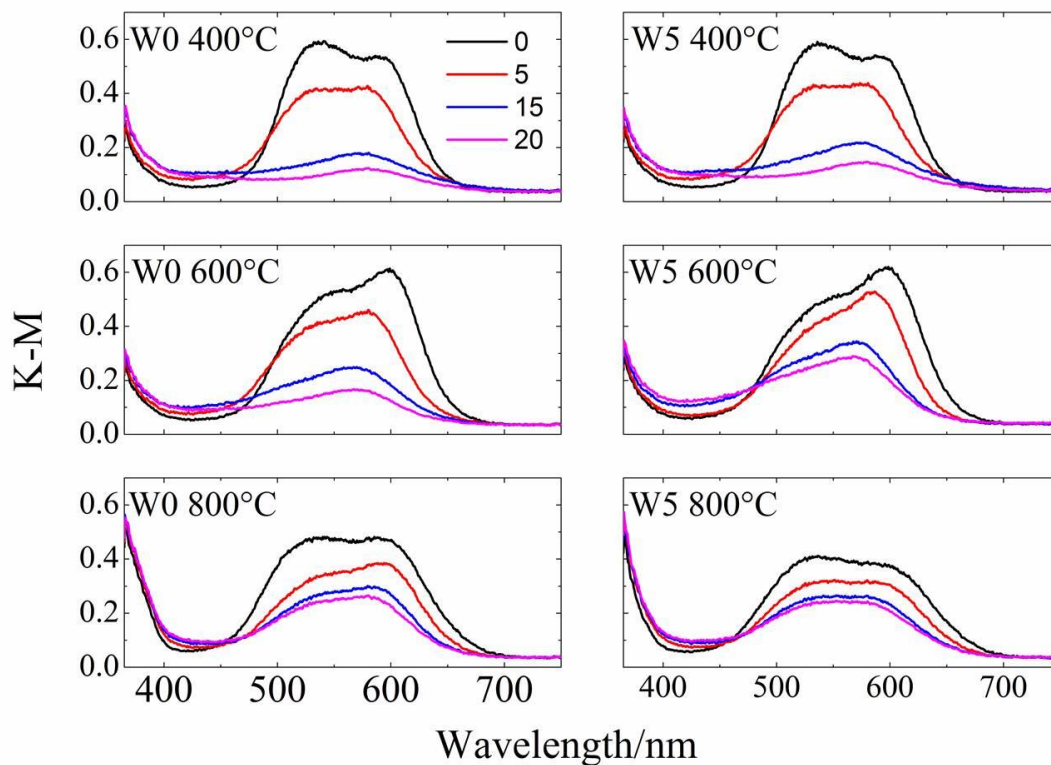


Figure S6. Diffuse reflectance spectra for crystal violet deposited over tiles coated with TiO_2 (W0) or 5% W doped TiO_2 (W5) films, exposed under halogen illumination during the indicated time. The reflectance was converted using the Kubelka-Munk equation [1].

- [1] J.H. Nobbs, Kubelka-Munk Theory and the Prediction of Reflectance, *Rev. Prog. Color. Relat. Top.* 15 (2008) 66–75. doi:10.1111/j.1478-4408.1985.tb03737.x.

Photocatalytic performance under different light conditions

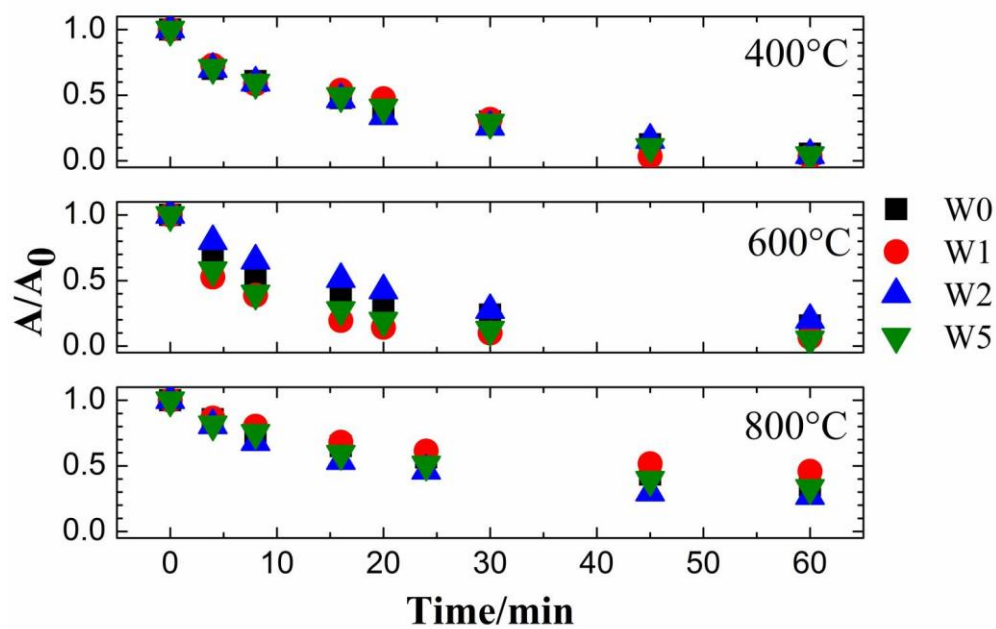


Figure S7. Photocatalytic performance of covered tiles under a *black light tube*.

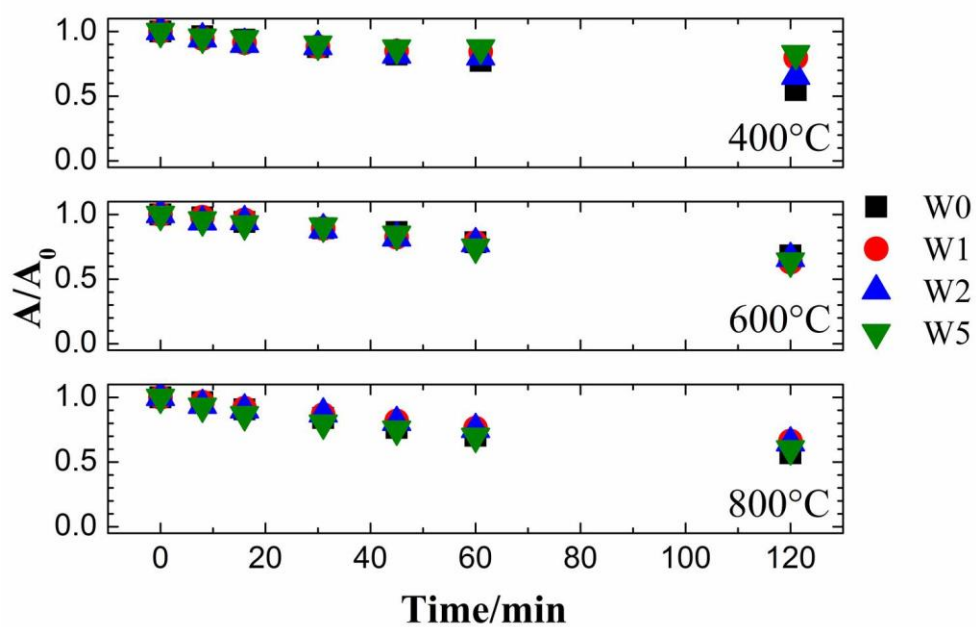


Figure S8. Photocatalytic performance of covered tiles under a *white light fluorescent tube*.

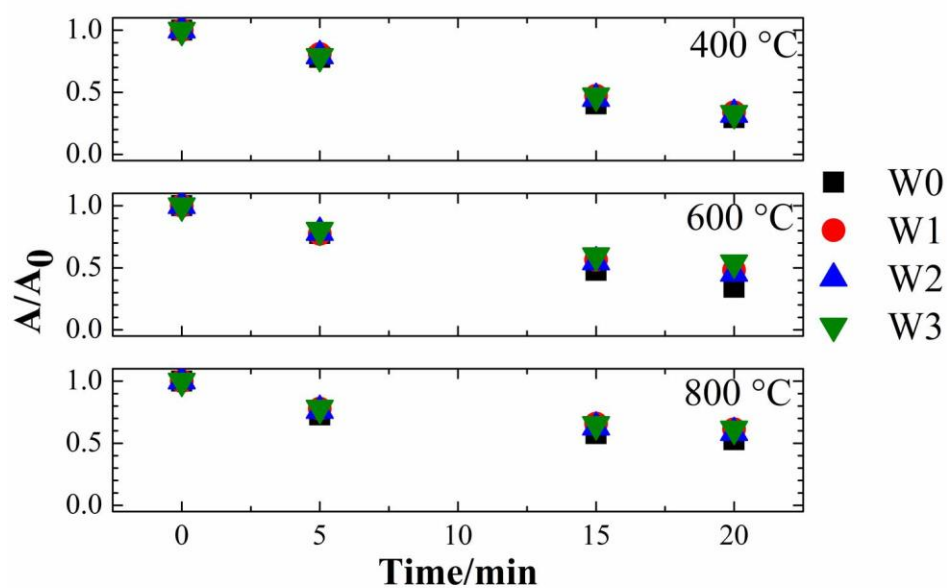


Figure S9. Photocatalytic performance of covered tiles under *vis* light illumination.

6. Reflectance spectra for covered and un-covered ceramic tiles

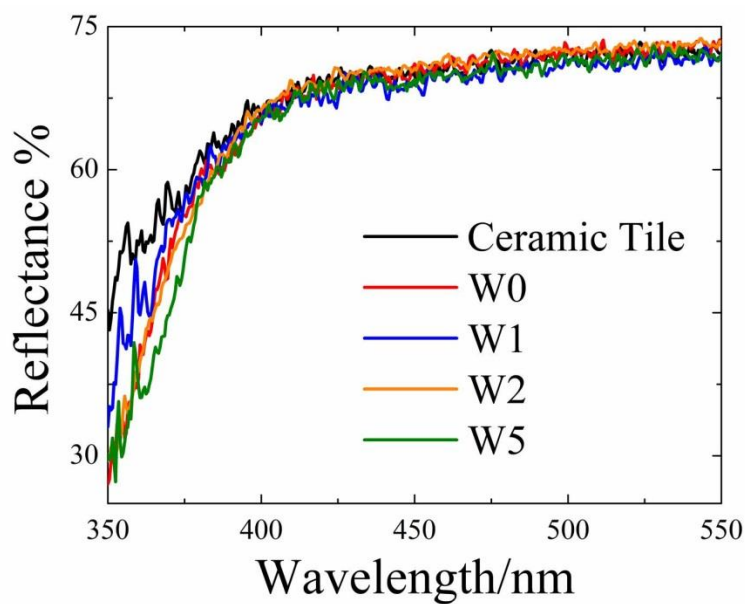


Figure S10. Reflectance spectra of covered ceramic tiles annealed at 600 °C. The black line correspond to the un-covered ceramic tile.

7. Ceramic tiles coating scale-up

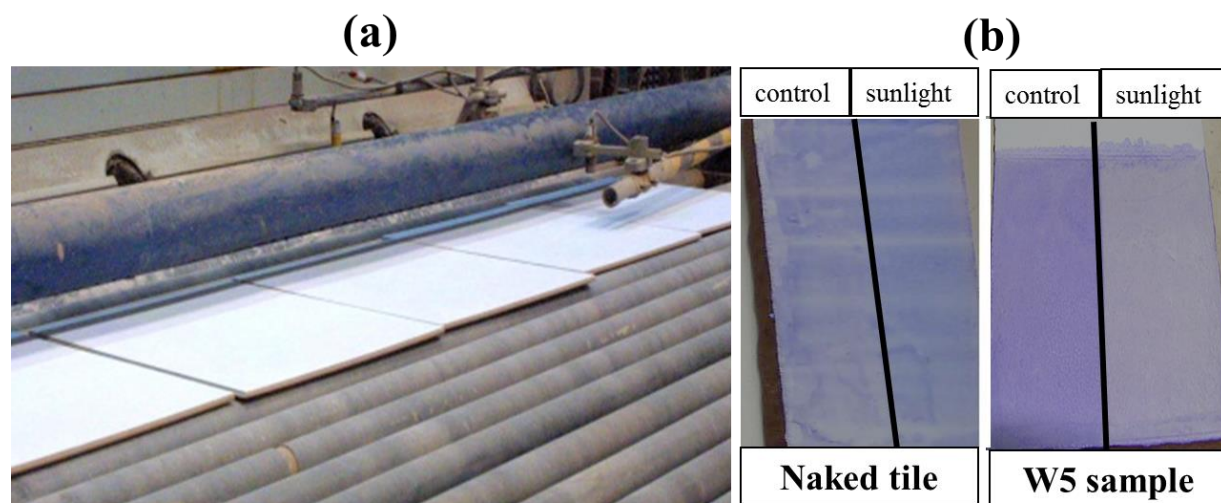


Figure S11. Milano glazed ceramic tiles coated with W-TiO₂ annealed in an industrial oven (600°C, 1 hour). (a) coated tiles coming out the oven during industrial processing, (b) CV degradation test using the industrial processed ceramic tiles exposed 20 min to spring sunlight (2:00 pm, latitude -38.75). CV was deposited on a naked ceramic tile (left) and on the ceramic tile coated with W5 sample (right). The surface at the left of black line was masked during sunlight exposition for control. CV photodegradation is negligible on the bare tile and nearly complete on the W-TiO₂ tile after 40 min sunlight exposure.