

Supporting Information for

From Solution to Microstructures in Minutes: Microdroplet-Derived Stand-alone TiO₂ Surfaces for Simultaneous Water Harvesting and Treatment

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Supporting Information Content

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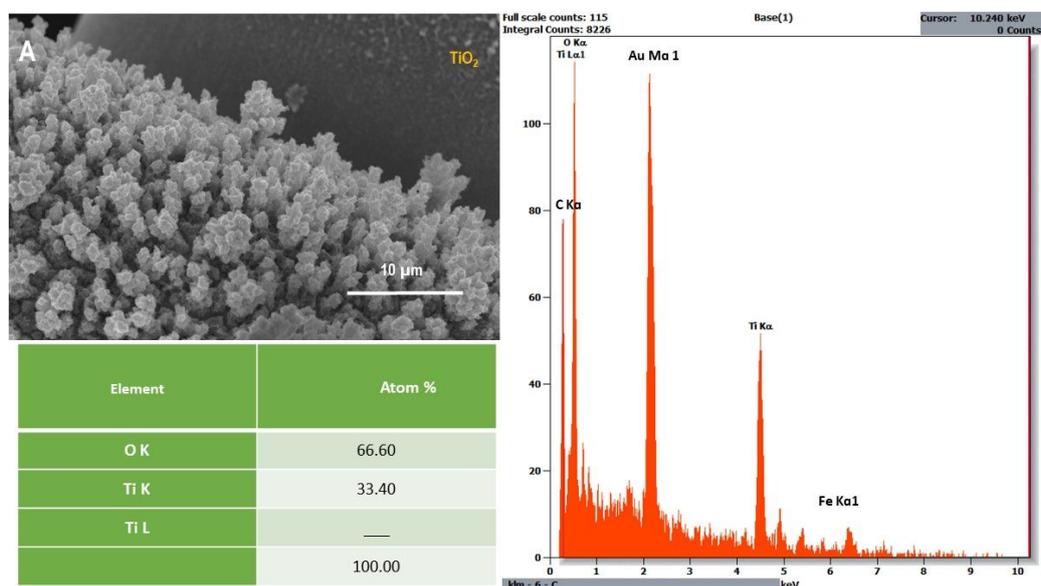


Figure S1. FESEM image and EDS spectrum of TiO₂ microstructures. The EDS-derived atomic percentages are presented in the table. The carbon peaks in the EDS spectra are attributed to carbon tape used to fix the sample on the SEM stub, with some contribution possibly from the organic counterpart of the precursors deposited during ESD. The Fe peak is attributed to the stainless-steel wire mesh.

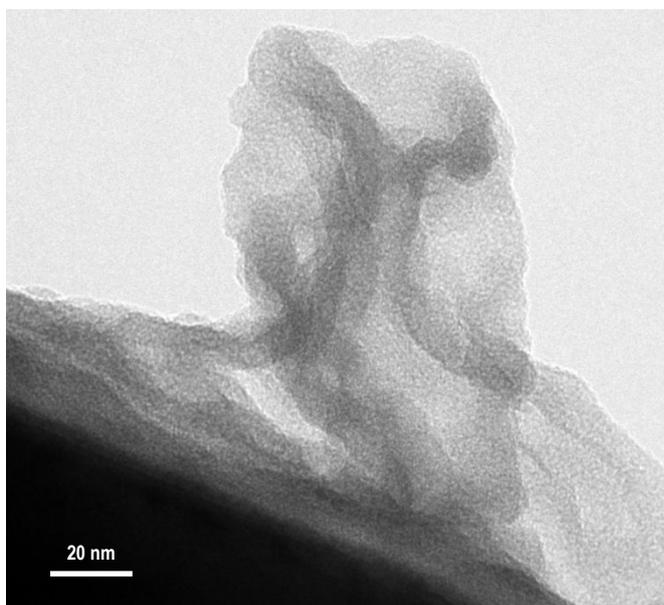


Figure S2. TEM image of TiO₂ structures formed after two minutes of deposition time.

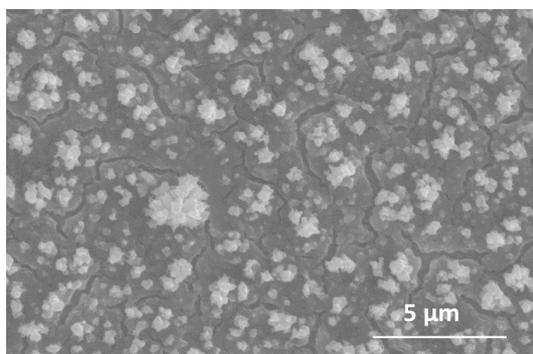


Figure S3. FESEM image of deposited TiO₂ on an ITO plate.

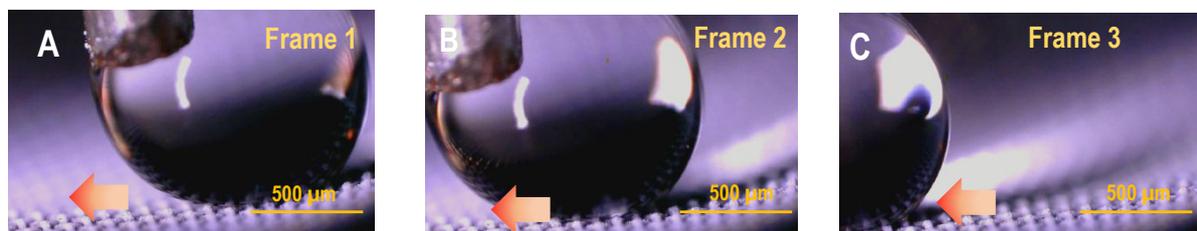


Figure S4. A water droplet roll-off experiment on TiO₂ microstructure surface.

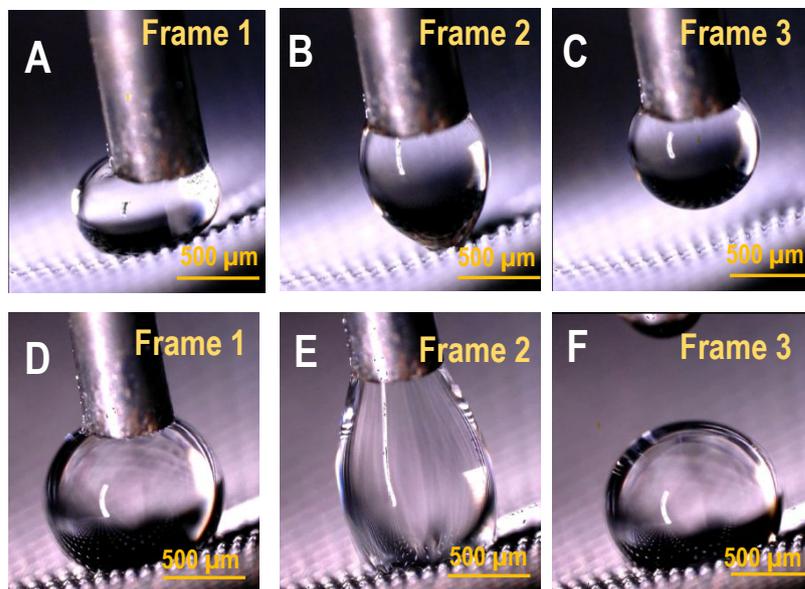


Figure S5. A water droplet adhesion experiment on (A-C) TiO₂ microstructure surface and on (D-F) SS wire mesh showing the superhydrophobicity of the TiO₂ structures.

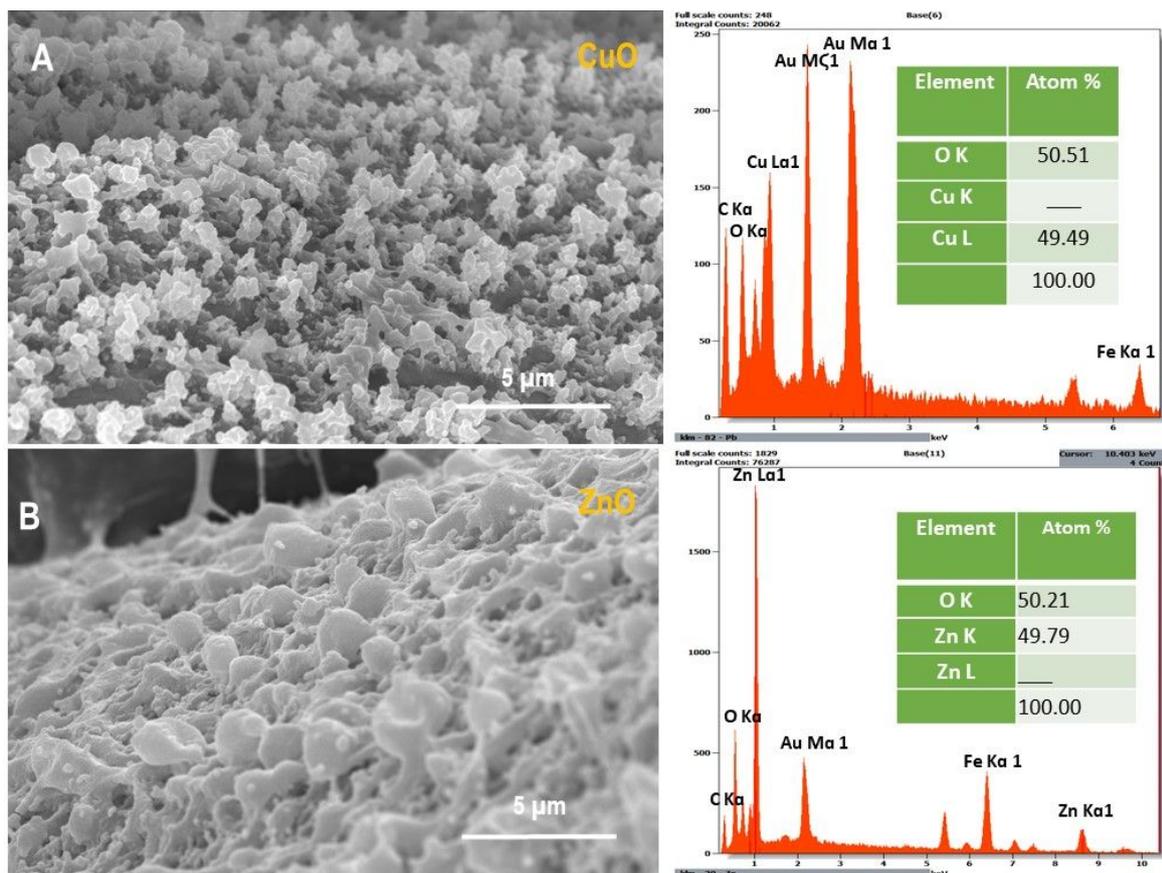


Figure S6. FESEM images and EDS spectra of A) CuO and B) ZnO microstructures. Elemental percentages are presented as insets.

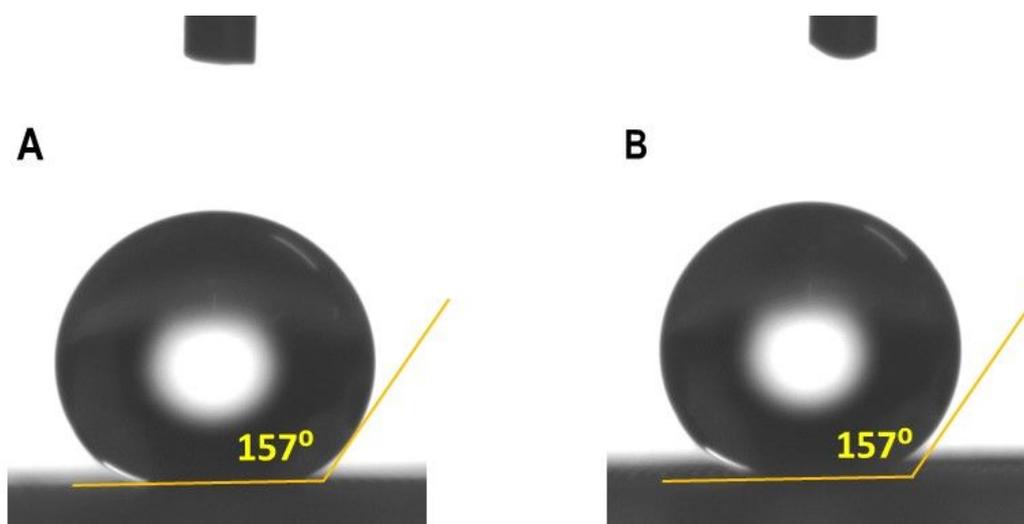


Figure S7. The contact angles of A) CuO-coated SS mesh and B) ZnO-coated SS mesh.

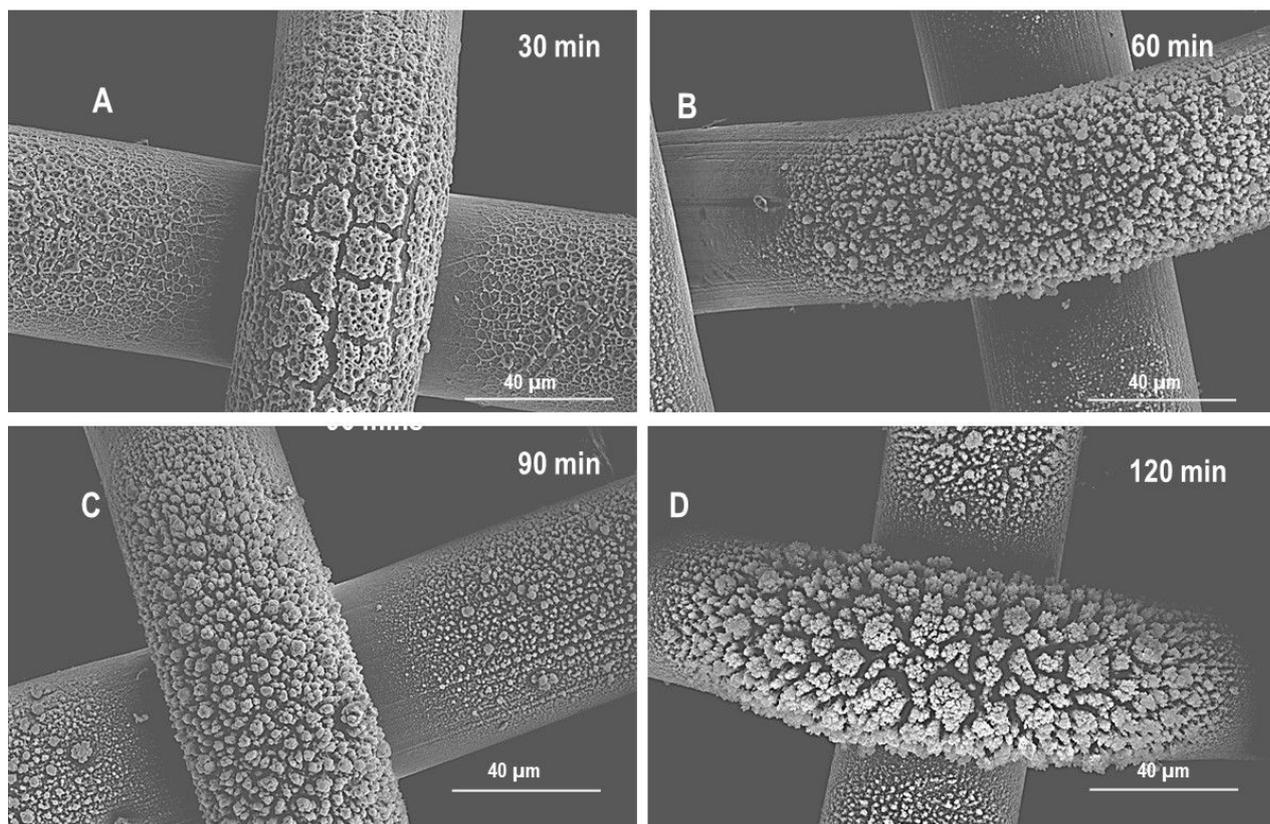


Figure S8. FESEM images of TiO₂ microstructures after ESD of A) 30 min, B) 60 min, C) 90 min, and D) 120 min at a junction of a wire-mesh.

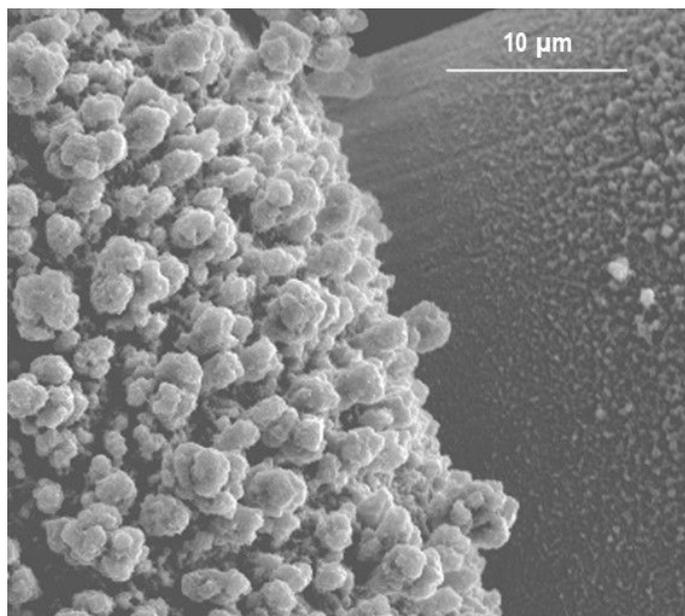


Figure S9. FESEM images of TiO₂ microstructures at higher deposition rate.

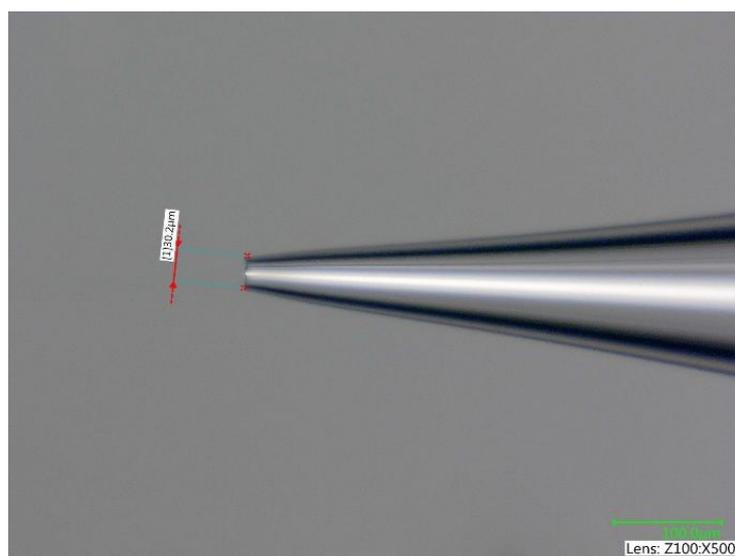


Figure S10. Optical image of a nESI tip (30 μm).

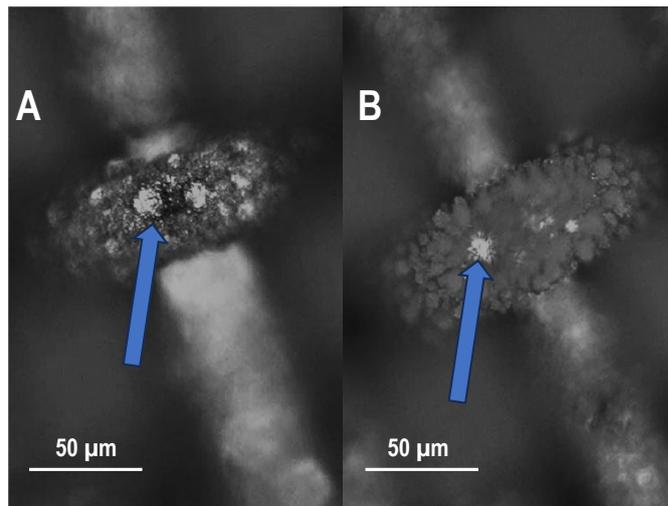


Figure S11. Atmospheric water harvesting on the TiO_2 microstructure, A) water nucleation on 1 h electro sprayed surface and B) water nucleation on 2 h electro sprayed surface.

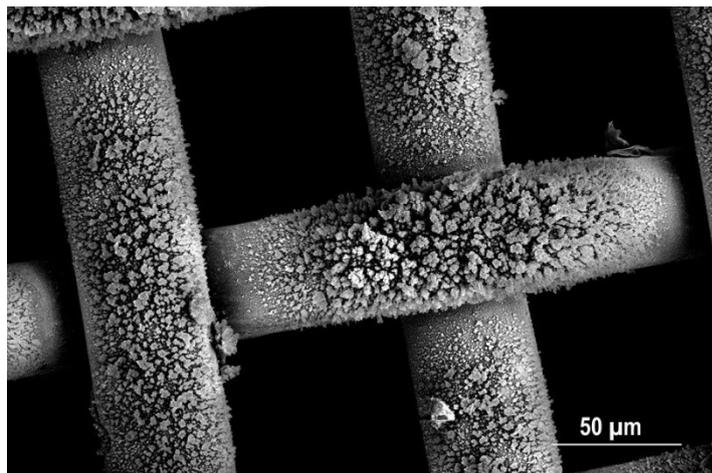


Figure S12. FESEM of the surface immersed in water for 1 h.

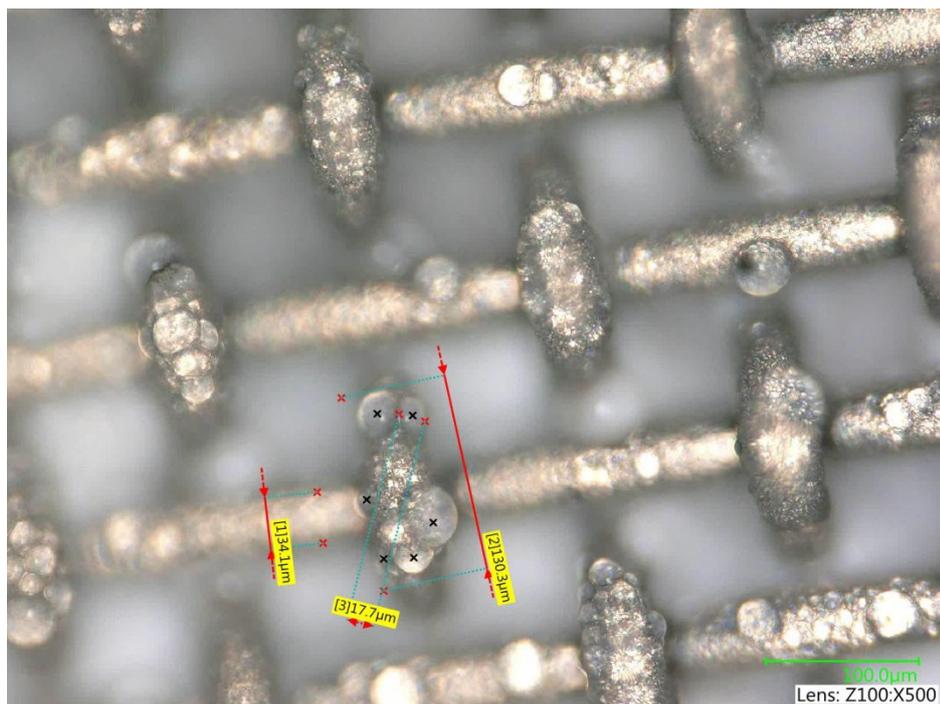


Figure S13. Optical image of TiO₂ microstructures during the AWC experiment. The length measurements indicate the area that was considered for calculating the AWC efficiency.

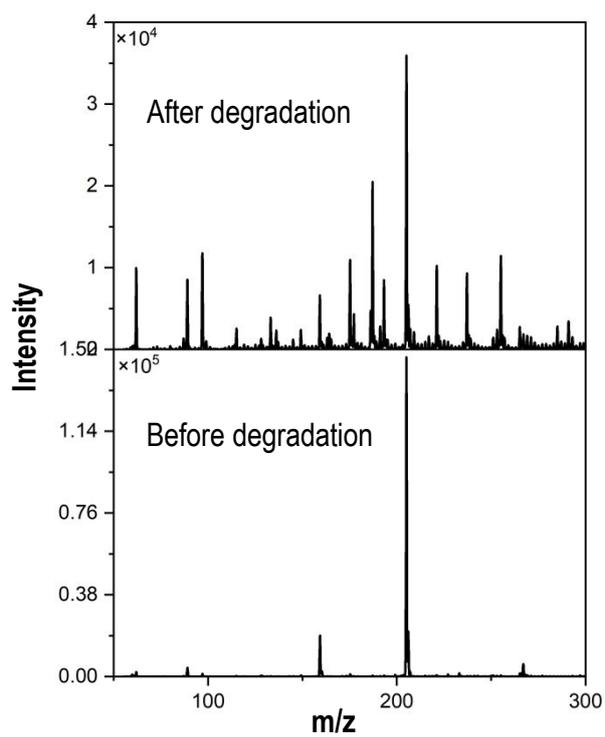


Figure S14. Mass spectrum showing photocatalytic degradation of ibuprofen on TiO₂ surface.

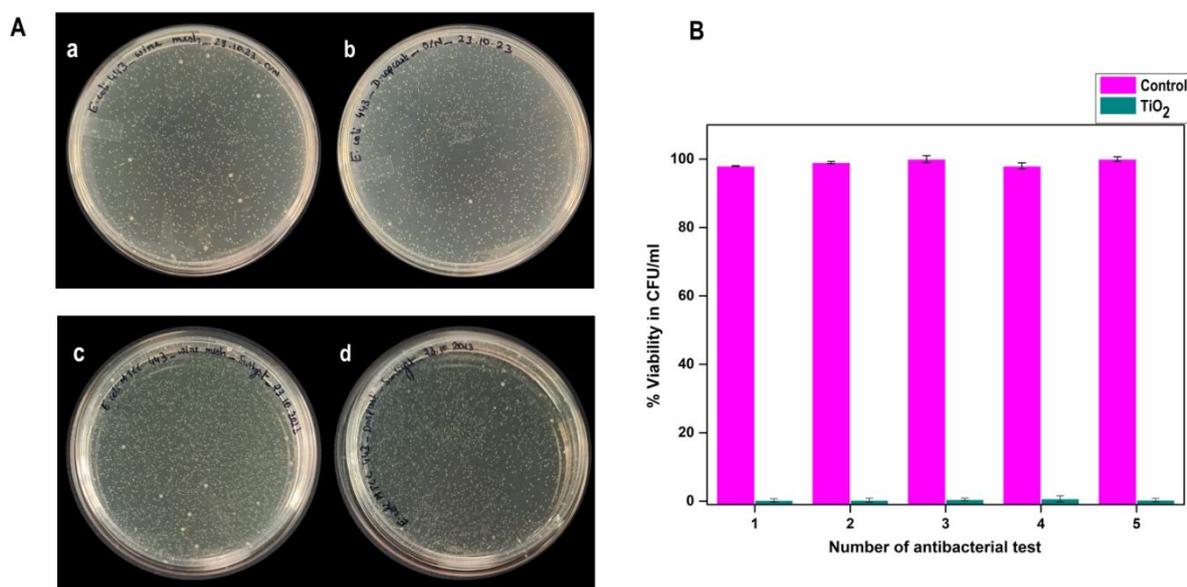
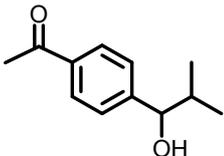
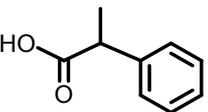
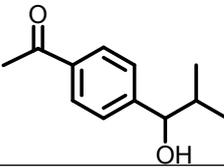
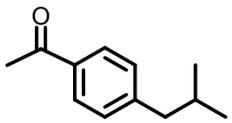
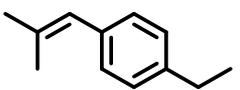
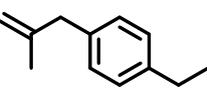
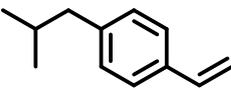
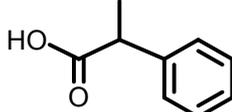
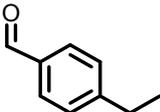


Figure S15. A) Growth of *E.coli* colonies on a) SS mesh, b) drop casted TTIP on an SS mesh, c) SS mesh after sunlight exposure, d) drop casted TTIP on SS mesh after sunlight exposure. B) Bar diagram showing the retained antibacterial activity of the TiO₂ surface after 5 repeated cycles of exposure of *E.coli* bacteria.

Table S1. Ibuprofen degradation products and m/z of the corresponding negative ions.

m/z of negative ions	Structures of degraded product molecules
255	Water adducts of <i>m/z</i> 237
237	
221	
193	

191	
177	 
175	
159	  
149	
133	

Video S1 is available separately as an AVI file.