

Table S1: Details to calculate Quantum yield and number of incident photons

<p style="text-align: center;">Quantum yield calculation:</p> <p>The quantum yield (lost bacteria CFU per incident UV photon per gram catalyst) has been calculated by knowing the number of lost Bacteria CFU, and dividing it by number of UV incident photons by grams of TiO₂ catalyst used. The number of UV incident photons has been calculated as follows:</p>	
Powder catalysts:	<p>Beaker radius = 2.5 cm Beaker cross sectional area = $2.5 \times 2.5 \times 3.14 = 19.6 \text{ cm}^2$</p> <p>Total incident power = $(0.136 \text{ W/cm}^2) \times 19.6 \text{ cm}^2 = 2.67 \text{ W}$</p> <p>Total incident energy in 1 h = $2.67 \text{ W} \times 1 \text{ h} \times 60 \text{ min} \times 60 \text{ s/min} = 9612 \text{ J}$</p> <p>UV incident energy (5% photons shorter than 400 nm) = $9612 \text{ J} \times 5/100 = 480.6 \text{ J}$</p> <p>$480.6 \text{ J UV} = (nhhc/\lambda) = n \times [6.626 \times 10^{-34} \text{ J/s}] \times [3 \times 10^8 \text{ m/s}] / [400 \times 10^{-9} \text{ m}]$</p> <p>Where n = number of photons, h is Planck constant, c is speed of light, λ is UV wavelength in m</p> <p>$480.6 = n \times [0.05] \times 10^{-17} =$</p> <p>Number of incident UV photons = $\sim 9612 \times 10^{17} = 9.612 \times 10^{20}$ photons</p>
Film catalysts:	<p>Total exposed catalyst area = $2 \text{ slides} \times 2.5 \times 7.5 \text{ cm}^2/\text{slide} = 37.5 \text{ cm}^2$</p> <p>Total incident power = $0.136 \text{ W/cm}^2 \times 37.5 \text{ cm}^2 = 5.1 \text{ W}$</p> <p>Total incident energy in 3 h = $5.1 \text{ W} \times (3 \text{ h}) \times (60 \text{ min/h}) \times (60 \text{ s/min}) = 55080 \text{ J}$</p> <p>Total incident UV energy = $55080 \times 5/100 = 2754 \text{ J}$</p> <p>$nh\nu = nhhc/\lambda \text{ meter}$</p> <p>$2754 \text{ J} = n \times [6.626 \times 10^{-34} \text{ J/s} \times \{(3 \times 10^8 \text{ m/s}) / (400 \times 10^{-9} \text{ m})\}]$</p> <p>$2754 \text{ J} = n \times 0.05 \times 10^{-17}$</p> <p>Number of incident UV photons = $55080 \times 10^{17} = 55 \times 10^{20}$</p>