

Electronic Supporting Information for

Improving photocatalytic oxygenations mediated by polymer supported photosensitizers using semiconductor quantum dots as ‘light antennas’

Víctor Fabregat, M. Isabel Burguete, Santiago V. Luis* and Francisco Galindo*

Universitat Jaume I, Departamento de Química Inorgánica y Orgánica

Av. Sos Baynat, s/n, E-12071 Castellón (Spain)

E-mail: luiss@uji.es, francisco.galindo@uji.es

Experimental section

Quantum dots (Lumidot) and ADPA were purchased from Sigma-Aldrich. Methanol was ultra-pure grade. UV/Vis absorption measurements were recorded on a Hewlett–Packard 8453 spectrophotometer. Steady-state fluorescence spectra were recorded on a Spex Fluorolog 3–11 fluorimeter equipped with a 450 W xenon lamp. Fluorescence spectra were recorded in the front-face mode. The scanning electron microscope (SEM) samples were prepared by slow evaporation of suspensions of the materials directly onto the sample holder. Images were acquired on a JEOL 7001F SEM at beam energy 5.0 kV. Polymers Pc and Pa were prepared as previously described.¹ Hybrids with adsorbed QDs were prepared as follows: 12 mg of Pa or Pc were weighed and suspended with sonication (5 min) in 3 mL of MeOH. To these samples, variable volumes (25 to 200 μ L) of toluene solutions of commercial QD480 or QD530 (5 mg/mL) were added, with overnight agitation. Samples for irradiations were used directly. Irradiations were conducted with a 450 W xenon lamp as light source and using a monochromator to select the wavelength of 450 nm (\pm 1 nm). The reactions were conducted in closed, air equilibrated, quartz cells containing 12 mg of material in 3 mL of methanol, with continuous magnetic stirring.

¹ V. Fabregat, M. I. Burguete, F. Galindo, S. V. Luis, *Env. Sci. Pollut. Res.* **2014**, *21*, 11884–11892.

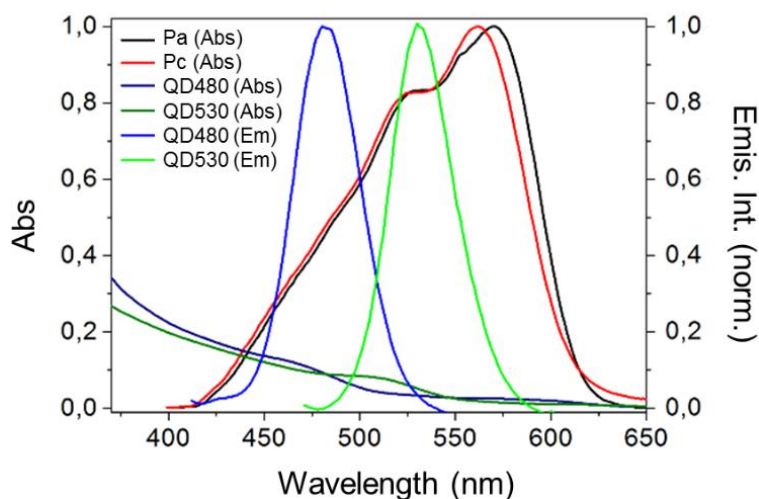
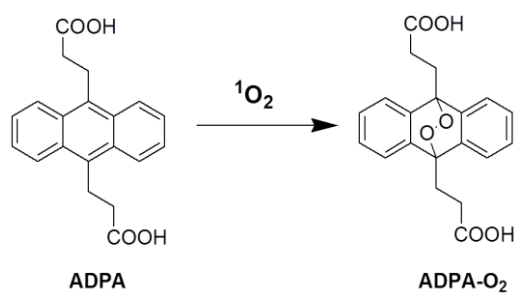


Figure S1. Absorption spectra of QD480 and QD530. Normalized emission spectra of Pc, Pa, QD480 and QD530.



Scheme S1. Reaction of 9,10-antracenedipropionic acid with singlet oxygen.

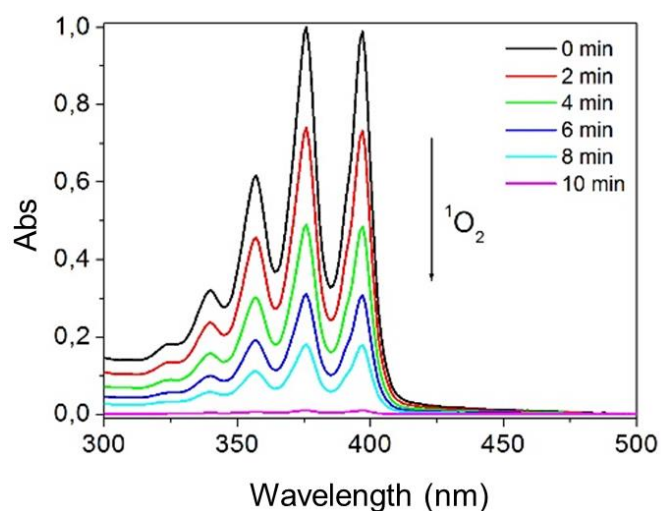


Figure S2. Representative example of reaction of ADPA (1.2×10^{-4} M in MeOH) with singlet oxygen (photocatalyst is QD530@Pa (4 mg/mL); loading is $41.7 \mu\text{g}$ QD/mg polymer; excitation wavelength is 450 nm).