TiO_2 and TiO_2-carbon hybrid photocatalysts for diuron removal from water

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Supplementary Materials

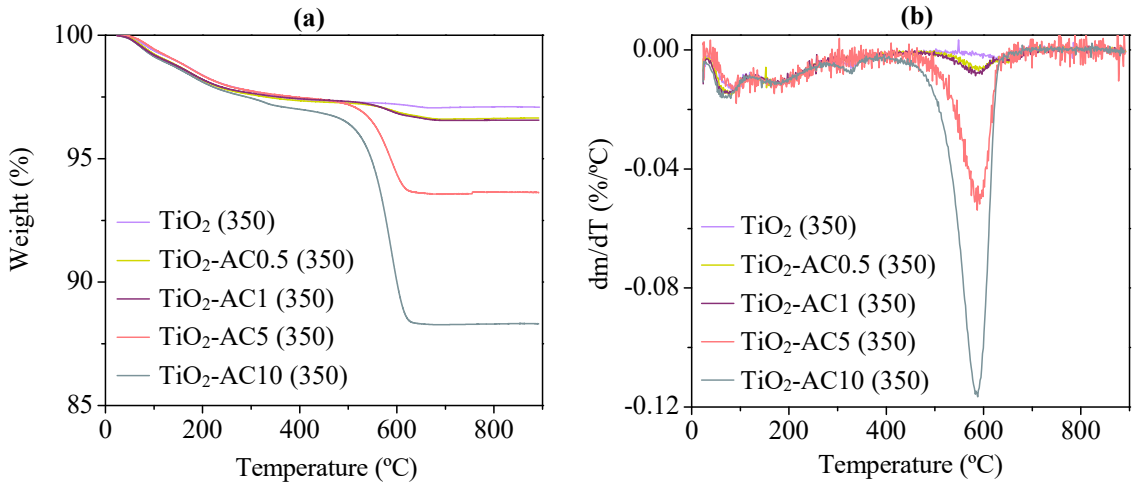

Figure S1. (**a**) TG and (**b**) DTG curves for TiO_2 (350) and the TiO_2-ACx (350) samples.

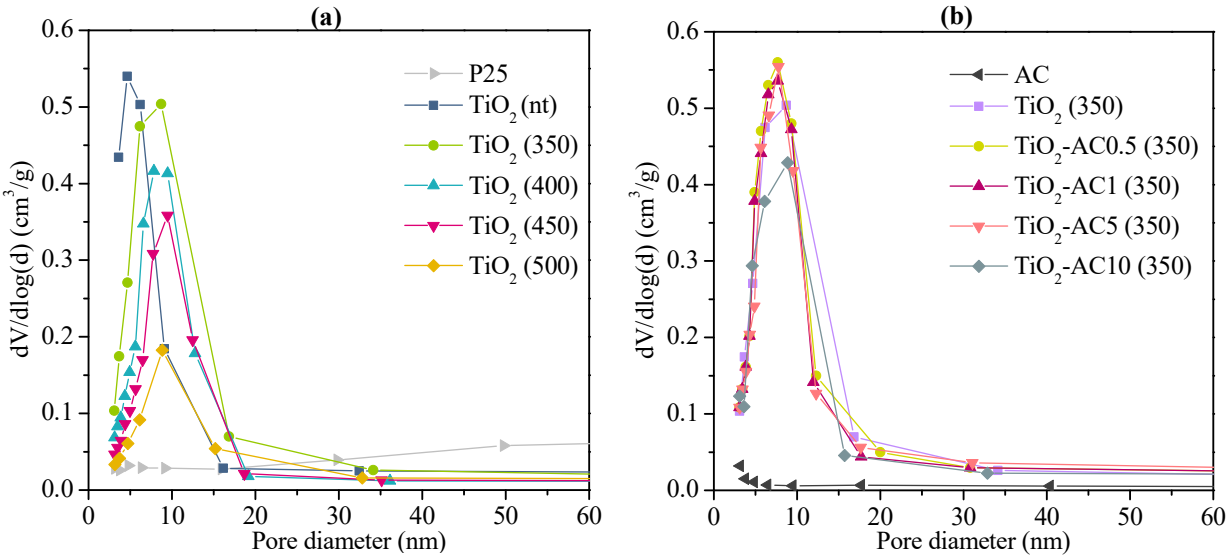

Figure S2. Pore size distribution determined from the nitrogen adsorption isotherms by means of the BJH method.

Table S1. Weight loss (wt. %) in the four temperature intervals observed in the TG-DTG profiles (Figure S2) and calculated carbon content.

T interval (ºC) / Sample	Weight loss (wt. %)				C content (wt. %)
	25-120	120-270	270-400	450-650	
TiO_2 (350)	0.8	1.3	0.5	0.2	0.0
TiO_2-AC0.5 (350)	0.9	1.3	0.4	0.6	0.4
TiO_2-AC1 (350)	1.0	1.2	0.3	0.7	0.5
TiO_2-AC5 (350)	0.8	1.4	0.4	3.8	3.6
TiO_2-AC10 (350)	1.1	1.3	0.6	8.5	8.3

Table S2. Textural properties for P25, TiO_2 (nt) and TiO_2 (T) samples (Set 1) and for AC, TiO_2 (350) and TiO_2-ACx (350) samples (Set 2).

Set	Sample	S_{BET} (m^2/g)	$V_{DR\ N_2}$ (cm^3/g)	V_{meso} (cm^3/g)	V_T (cm^3/g)
1	P25	57	0.02	0.12	0.17
	TiO_2 (nt)	296	0.11	0.17	0.32
	TiO_2 (350)	144	0.05	0.18	0.25
	TiO_2 (400)	98	0.04	0.13	0.18
	TiO_2 (450)	72	0.05	0.10	0.15
	TiO_2 (500)	45	0.02	0.07	0.09
2	AC	491	0.25	0.02	0.27
	TiO_2 (350)	144	0.05	0.18	0.25
	TiO_2-AC0.5 (350)	154	0.06	0.18	0.27
	TiO_2-AC1 (350)	151	0.06	0.15	0.25
	TiO_2-AC5 (350)	164	0.06	0.16	0.26
	TiO_2-AC10 (350)	173	0.07	0.15	0.25

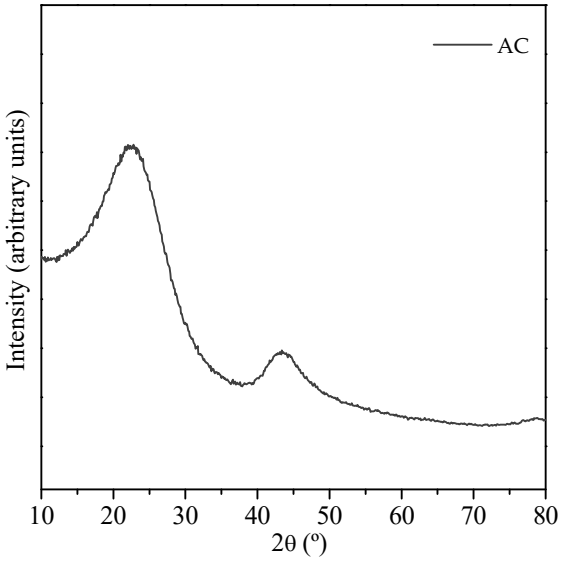

Figure S3. XRD pattern for AC.

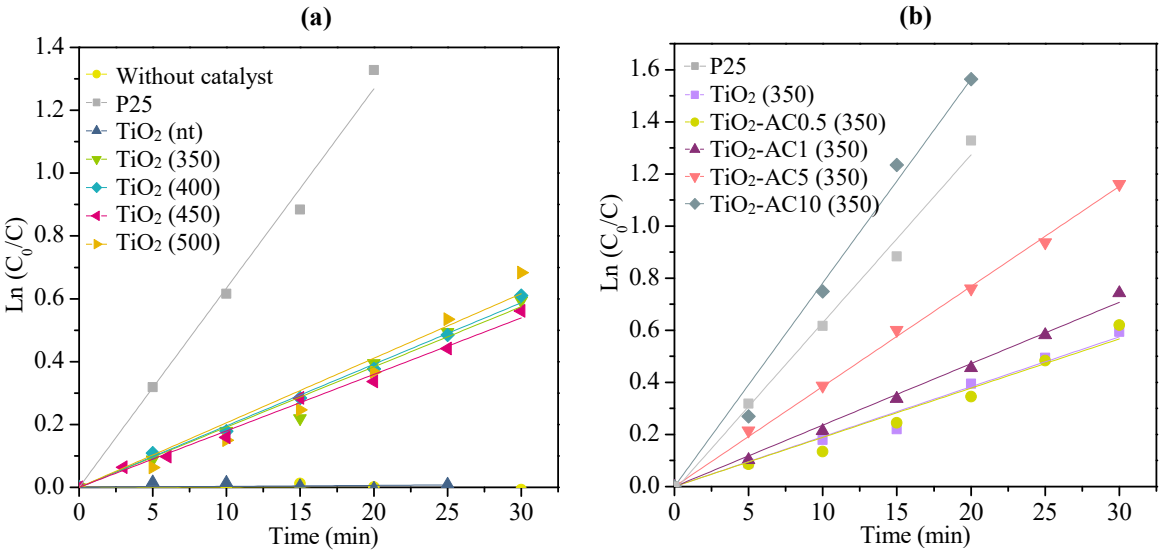

Figure S4. Ln(C_0/C) *vs*. irradiation time for: (**a**) P25, TiO_2 (nt) and TiO_2 (T) photocatalysts and (**b**) P25 and TiO_2-ACx (350) (x = 0, 0.5, 1, 5 and 10 wt. %) hybrid photocatalysts. Reaction: degradation of diuron under simulated solar light.

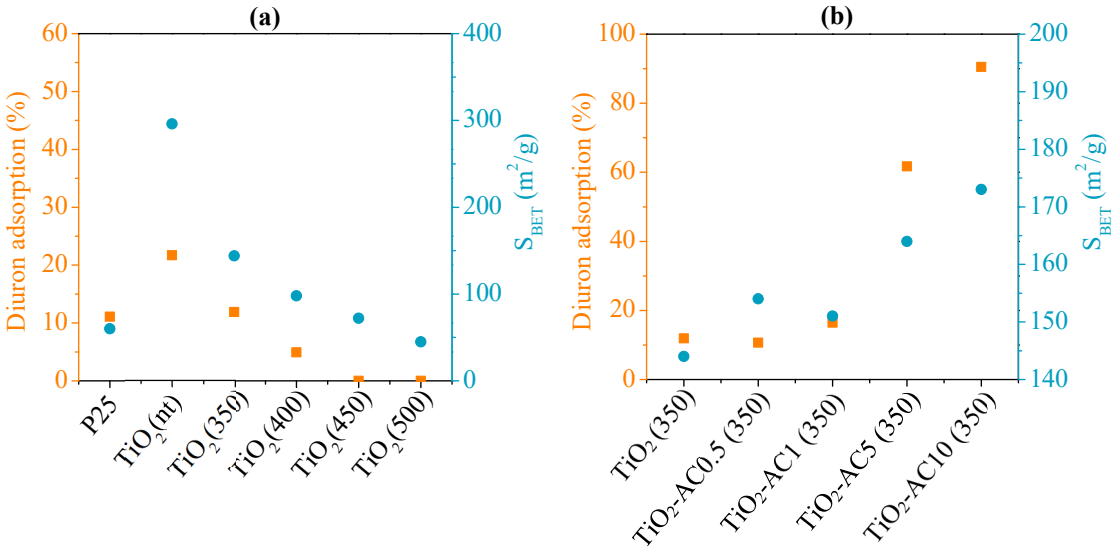

Figure S5. Diuron adsorption (as % respect to the initial diuron concentration) after 2h in dark and S_{BET} values for: (**a**) P25, TiO_2 (nt) and TiO_2 (T) photocatalysts and **(b)** TiO_2-ACx (350) (x = 0, 0.5, 1, 5 and 10 wt. %).

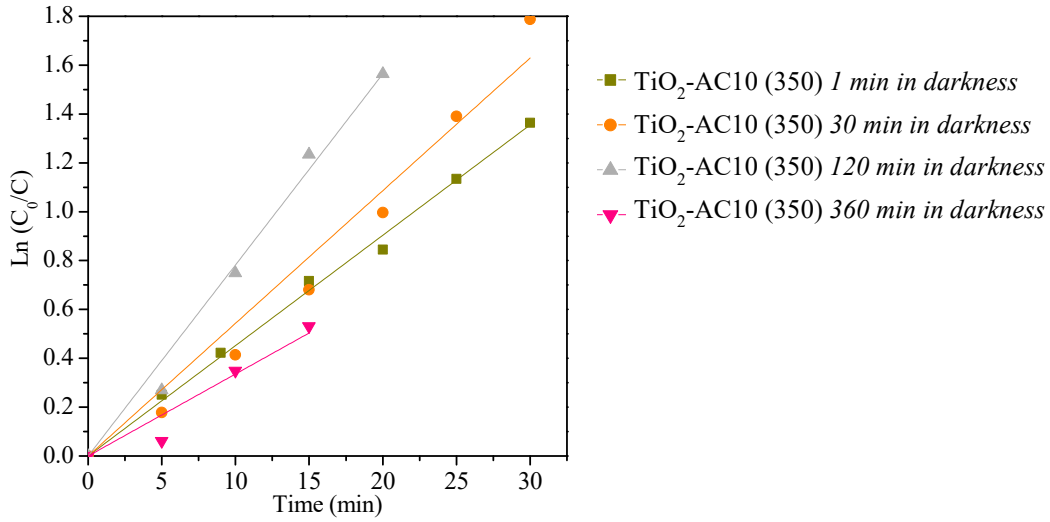

Figure S6. Ln(C_0/C) *vs*. irradiation time for TiO_2-AC10 (350) sample after 1, 30, 120 or 360 min in dark conditions. Reaction: diuron degradation under simulated solar light.

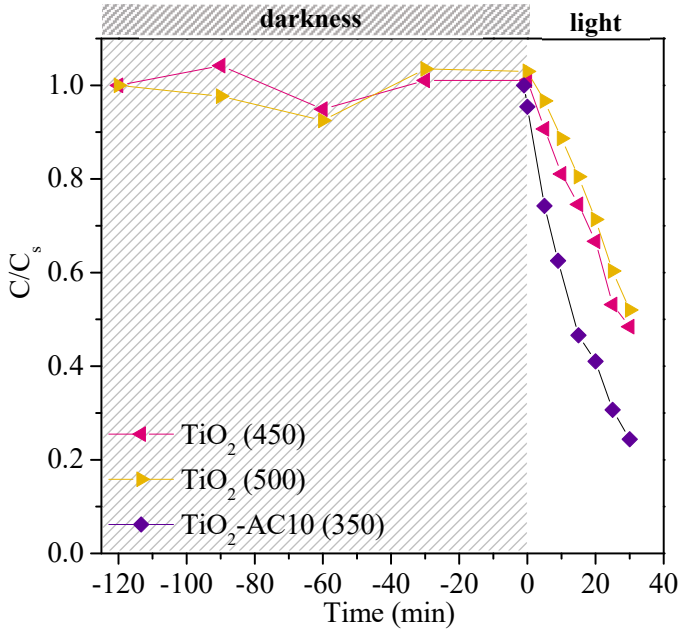

Figure S7. Evolution of the relative diuron concentration *vs* time in dark and under illumination conditions for TiO_2-AC10 (350) sample (1 min in darkness) and for TiO_2 (450) and TiO_2 (500) samples (2 h in darkness).

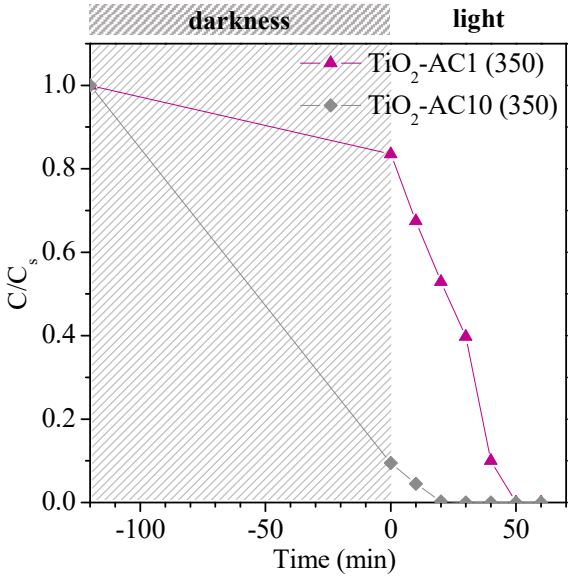

Figure S8. Relative diuron concentration *vs* time in darkness (2 h) and under illumination conditions (1 h) for TiO_2-AC1 (350) and TiO_2-AC10 (350) samples (after 1 h irradiation the complete removal of diuron was observed).

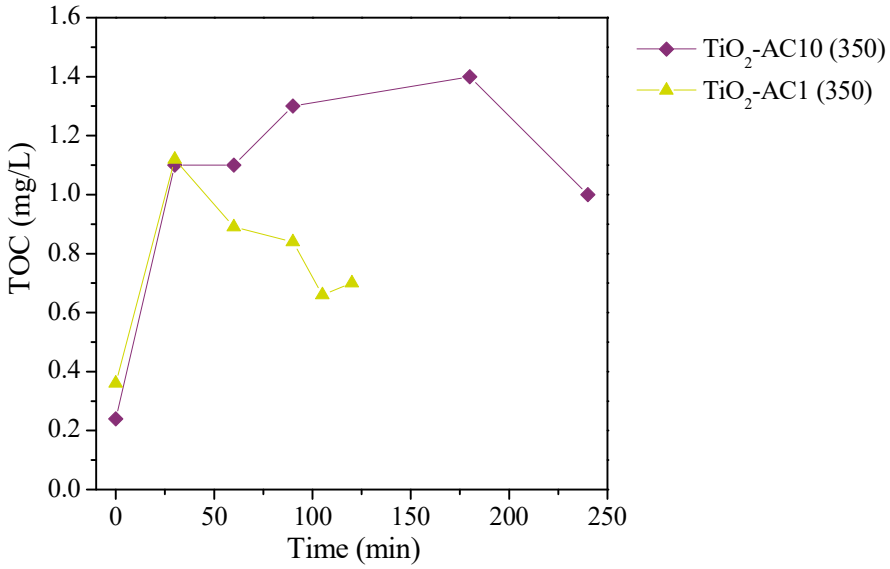

Figure S9. TOC values *vs* irradiation time determined during reuse of TiO_2-AC1 (350) and TiO_2-AC10 (350) hybrid photocatalysts. Reaction: diuron degradation under simulated solar light.

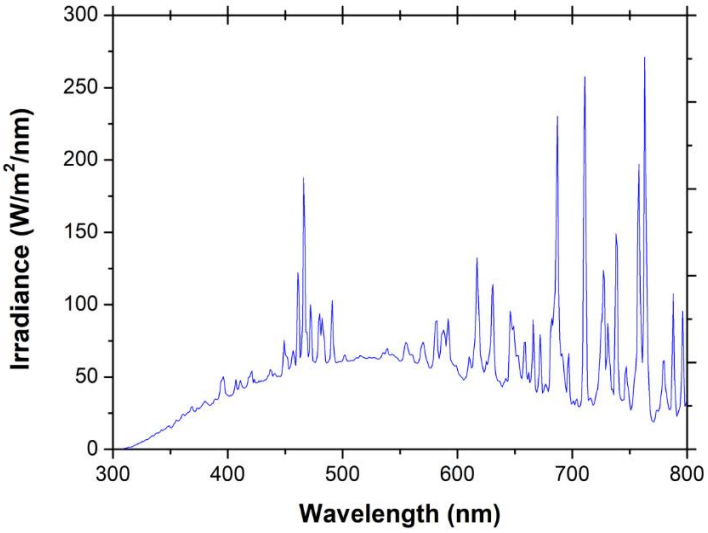

Figure S10. Spectral distribution of the simulated solar light. Measurements have been performed using a wideband RPS900-W rapid portable spectroradiometer from International Light Technology.