

Electronic Supplementary Information (ESI)

A positive effect of anatase and rutile on the brookite-photocatalyzed degradation of phenol

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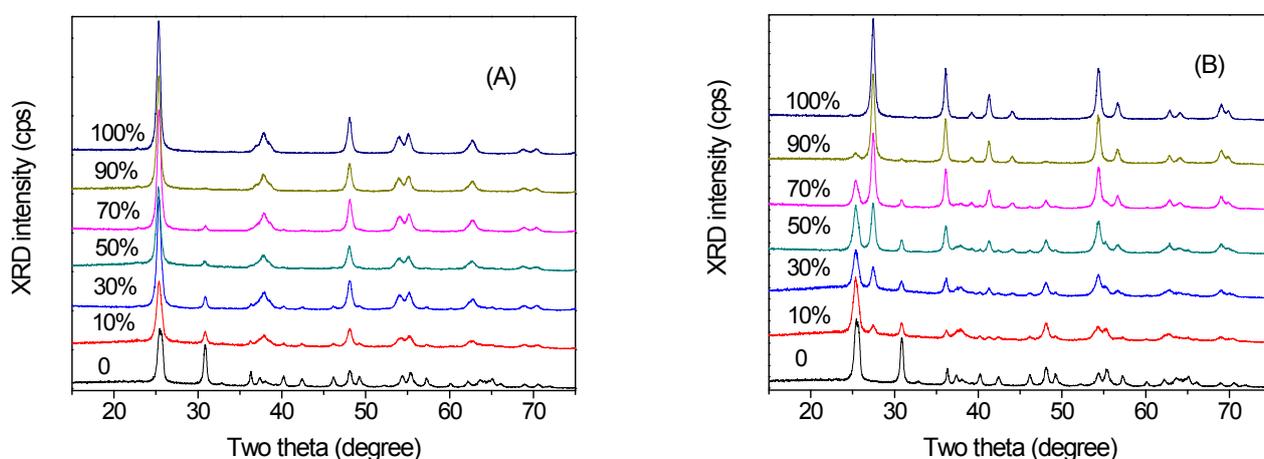


Fig. S1. XRD patterns of (A) cAT/sBT, and (B) sRT/sBT, at different weight percentages of cAT or sRT.

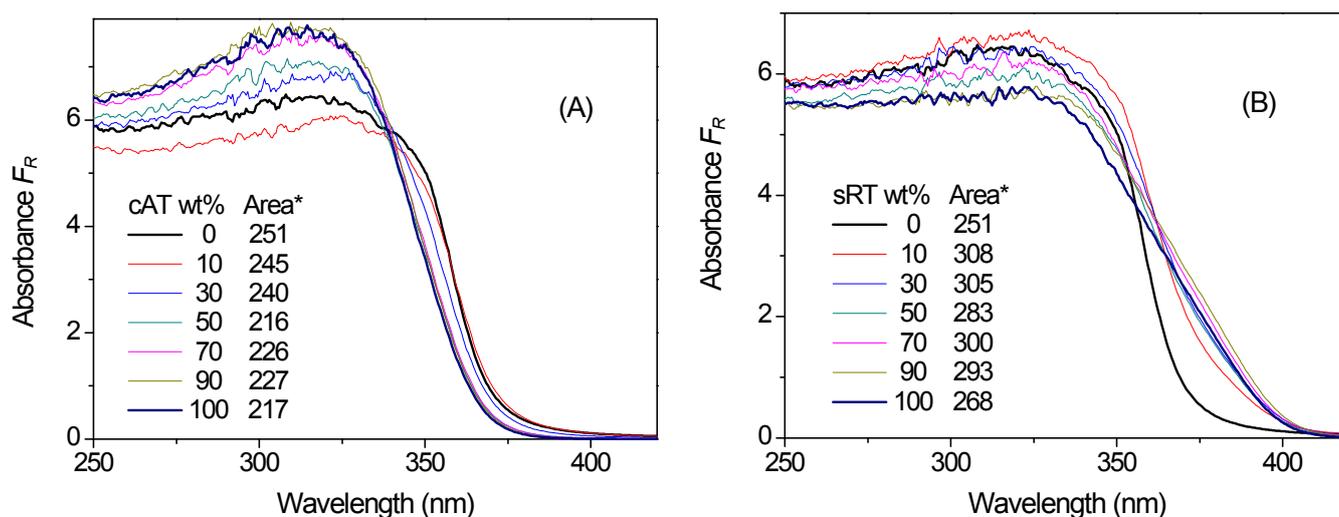


Fig. S2. Diffuse reflectance spectra of (A) cAT/sBT, and (B) sRT/sBT at different weight percentages of cAT or sRT, as indicated by the legends, where (Area*) represent the integrated area at $\lambda \geq 320$ nm. The reflectance (R) is transferred to the Kubelka–Munk (K–M) absorbance, by the equation, $F_R = (1-R)^2/2R$.

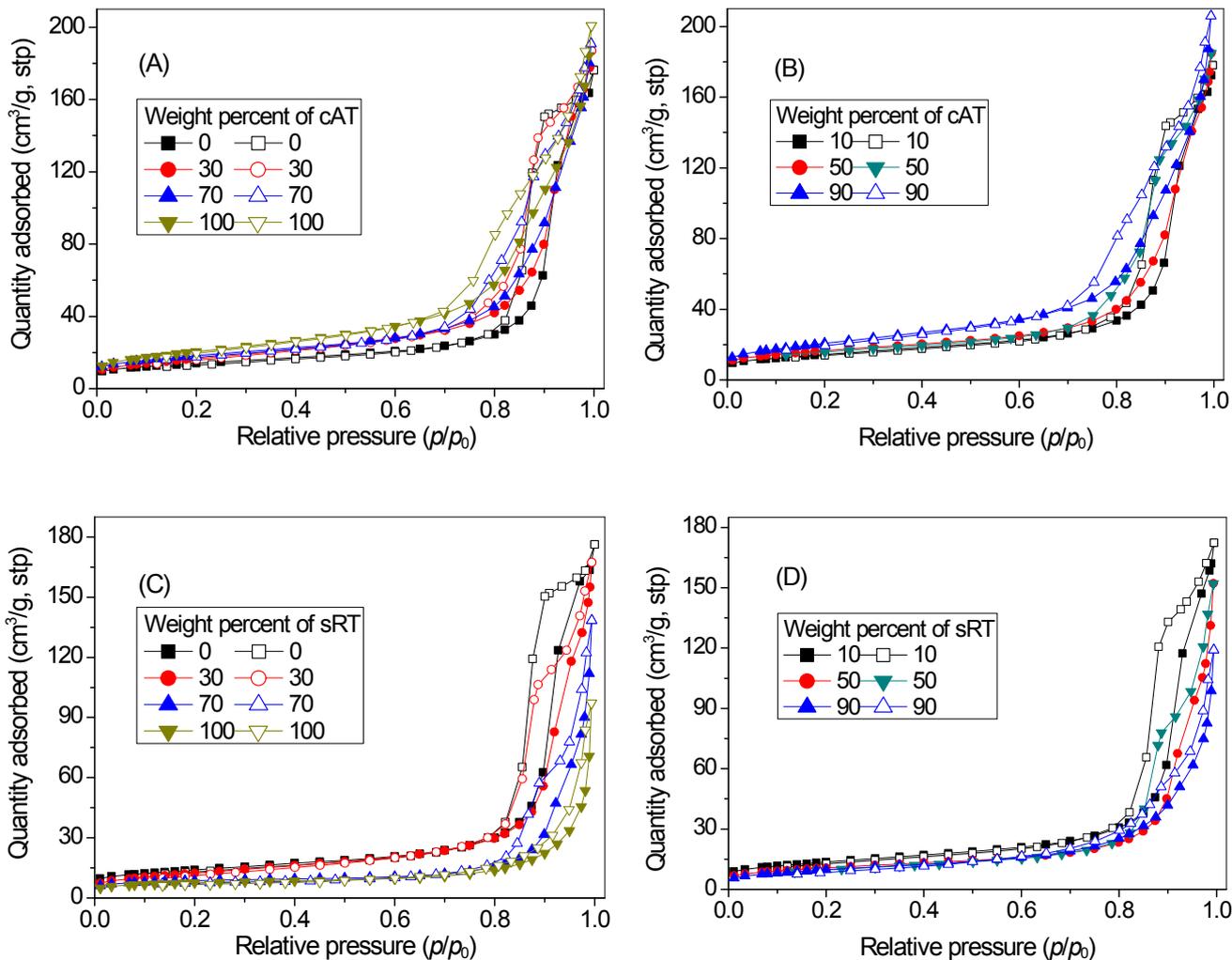


Fig. S3. Adsorption (solid symbols) and desorption (open symbols) isotherms of N₂ at 77 K on (A, B) cAT/sBT, and (C, D) sRT/sBT, at different weight percentages of cAT or sRT, as indicated by the legends.

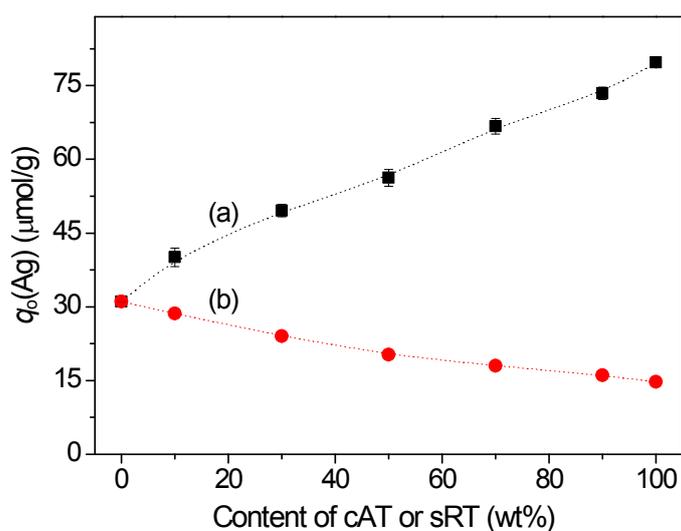


Fig. S4. Amount of Ag⁺ ions adsorbed on the oxide in aqueous suspension, measured in the dark and before light irradiation. These data correspond to those used in Figure 4 of the text.

Table S1. Physical Parameters of cAT/sBT and sRT/sBT at Different Weight Percents^a

Samples		d_{XRD} (nm)	A_{sp} (m ² /g)	V_{p} (cm ³ /g)	V_{m} (cm ³ /g)	d_{p} (nm)	E_{g} (eV)
sBT		20.4	48.3	0.273	0.00434	22.2	3.37
cAT	10%	21.0 (11.9)	50.7	0.275	0.00399	20.1	3.35
	30%	22.1 (14.5)	56.1	0.286	0.00389	19.7	3.34
	50%	20.6 (14.5)	60.1	0.289	0.00202	18.2	3.32
	70%	20.5 (16.0)	65.4	0.295	0.00135	16.9	3.30
	90%	21.7 (17.2)	71.1	0.308	0.00081	15.2	3.29
	100%	– (18.0)	73.4	0.311	0.00059	14.8	3.25
sRT	10%	21.6 (16.3)	46.3	0.266	0.00402	21.0	3.10
	30%	21.8 (18.0)	41.5	0.259	0.00311	22.6	3.08
	50%	22.6 (16.6)	37.3	0.235	0.00226	25.5	3.07
	70%	22.8 (17.6)	31.9	0.214	0.00166	30.1	3.06
	90%	21.4 (18.6)	28.1	0.184	0.00080	34.5	3.05
	100%	– (18.3)	25.3	0.151	0.00044	35.7	3.04

^a d_{XRD} , average crystallite size of brookite (anatase or rutile) in the mixed oxide, calculated by using Scherrer equation, according to the full-widths at half-maximum of (121) brookite at $2\theta = 30.8^\circ$ [(101) anatase at $2\theta = 25.3^\circ$, or (110) rutile at $2\theta = 27.4^\circ$]; A_{sp} , the BET specific surface area determined by N₂ adsorption; V_{p} , total pore volume from the desorption branch; V_{m} , micropore volume from a t -plot; d_{p} , average pore size; E_{g} , band gap energy estimated by a derivative method.