

Investigating the Synergistic Effect of Decoration and Doping in Silver/Strontium Titanate for Air Remediation

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Table S1. Theoretical molar ratios between elements in Ag-STO samples

Wt.% Ag	nSr	nAg	nTi
1	0.98	0.02	1
2.5	0.96	0.04	1
4	0.93	0.07	1
5.8	0.90	0.10	1
8	0.86	0.14	1

Table S2. Ag-STO samples structural parameters extracted from Rietveld refinements of the Miniflex measurements

Sample	STO (1:3)	1.0 wt.% Ag-STO	2.5 wt.% Ag-STO	4.0 wt.% Ag-STO	5.8 wt.% Ag-STO	8.0 wt.% Ag-STO
Phase	SrTiO ₃	SrTiO ₃	SrTiO ₃	SrTiO	SrTiO ₃	SrTiO ₃
Sp. Group	$Pm\bar{3}m$	$Pm\bar{3}m$	$Pm\bar{3}m$	$Pm\bar{3}m$	$Pm\bar{3}m$	$Pm\bar{3}m$
a/Å	3.90712(4)	3.90729(9)	3.90536(6)	3.90870(2)	3.90721(4)	3.90769(4)
Wt.%	94.5(1)	94.1(1)	98.7(1)	97.6(1)	96.1(1)	95.1(1)

Phase	Ag	Ag	Ag	Ag	Ag	Ag
Sp. Group	$Fm\bar{3}m$	$Fm\bar{3}m$	$Fm\bar{3}m$	$Fm\bar{3}m$	$Fm\bar{3}m$	$Fm\bar{3}m$
a/Å	-----	4.0867(3)	4.0874(2)	4.0874(2)	4.0887(1)	4.0900(1)
Wt. %	-----	0.62(2)	1.3(1)	2.4(1)	3.9(1)	4.9(1)
Phase	TiO ₂	TiO ₂	TiO ₂	TiO ₂	TiO ₂	TiO ₂
Sp. Group	$I4_1/amd$	$I4_1/amd$	$I4_1/amd$	$I4_1/amd$	$I4_1/amd$	$I4_1/amd$
a/Å	3.758(2)	3.733(3)	-----	-----	-----	-----
c/Å	9.943(8)	10.07(1)	-----	-----	-----	-----
Wt. %	5.5(1)	5.3(1)	-----	-----	-----	-----
U/Å ²	0.0055(2)	-0.0053(9)	0.0040(3)	0.151(3)	0.0037(1)	0.0034(1)
Rp	0.0305	0.0524	0.0497	0.0471	0.0239	0.0236
R(F ²)	0.0487	0.0566	0.0406	0.0388	0.0353	0.0356

Table S3. Structural parameters extracted from Rietveld refinements of XRD patterns collected on the 8.0 wt.% Ag-STO samples using the Miniflex measurements

Sample					
Phase	SrTiO₃	SrTiO₃	SrTiO₃	SrTiO₃	SrTiO₃
Treatment	900 °C	1100 °C 15 h	1000 °C 10 h	1100 °C 10 h	1100 °C 2 h
Sp. Group	<i>Pm$\bar{3}m$</i>	<i>Pm$\bar{3}m$</i>	<i>Pm$\bar{3}m$</i>	<i>Pm$\bar{3}m$</i>	<i>Pm$\bar{3}m$</i>
a/Å	3.90769(4)	3.90698(6)	3.90781(4)	3.90688(5)	3.90645(6)
Wt.%	95.1(1)	97.3(1)	95.2(1)	96.3(1)	95.8(1)
Phase	Ag	Ag	Ag	Ag	Ag
Sp. Group	<i>Fm$\bar{3}m$</i>	<i>Fm$\bar{3}m$</i>	<i>Fm$\bar{3}m$</i>	<i>Fm$\bar{3}m$</i>	<i>Fm$\bar{3}m$</i>
a/Å	4.0900(1)	4.0870(1)	4.0886(1)	4.0875(1)	4.0879(1)
Wt.%	4.9(1)	2.7(1)	4.8(1)	3.6(1)	4.2(1)
U/Å ²	0.0034(1)	-0.0029(3)	0.0028(2)	-0.0054(3)	0.0010(3)
Rp	0.0236	0.0254	0.0198	0.0260	0.0485
R(F ²)	0.0356	0.0370	0.0395	0.0642	0.0469

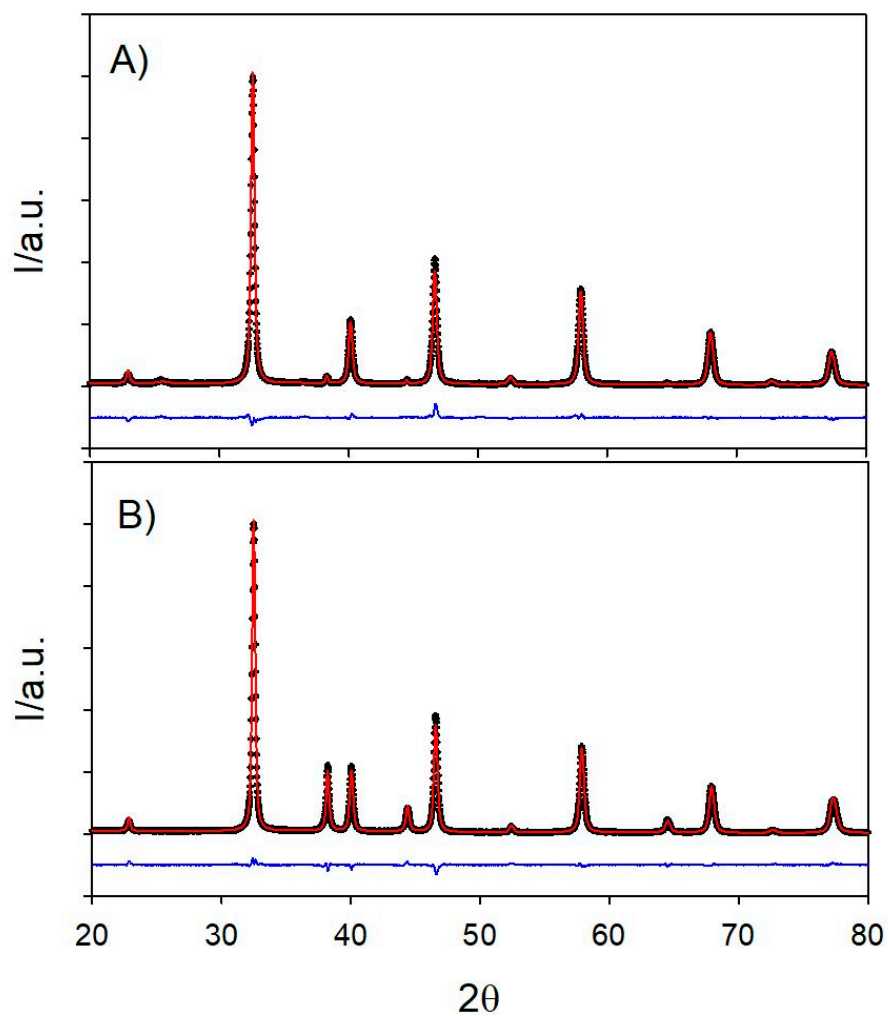


Figure S1. Rietveld refinements of 1.0% Ag-STO (panel A) and 5.8% Ag-STO (panel B) samples. Experimental XRPD patterns, fitted curve and residuals are depicted as black symbols, red and blue curves, respectively.

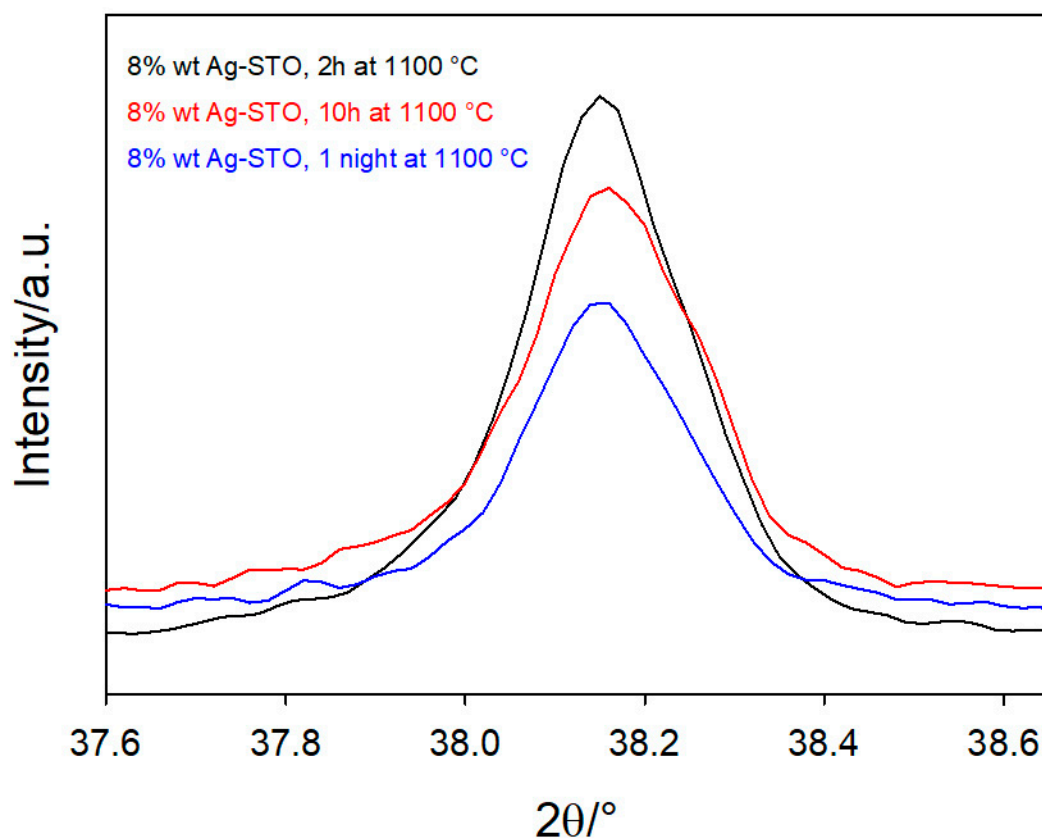


Figure S2. Zoom of the diffraction peak Ag(111) for the 8.0%wt.Ag-STO photocatalysts exposed for different times at the highest temperature (1100 °C).

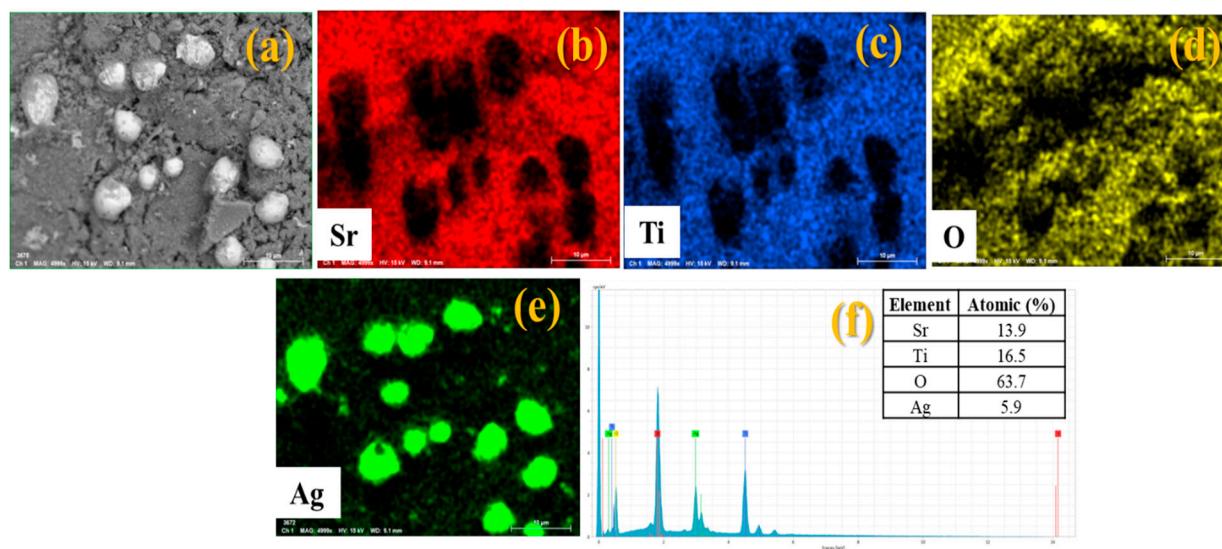


Figure S3. SEM image (a), elemental mapping of Strontium (b), Titanium (c), Oxygen (d), Silver (e), and EDX spectrum (f) of 8.0 wt.% Ag-STO_1100C_2h photocatalyst.

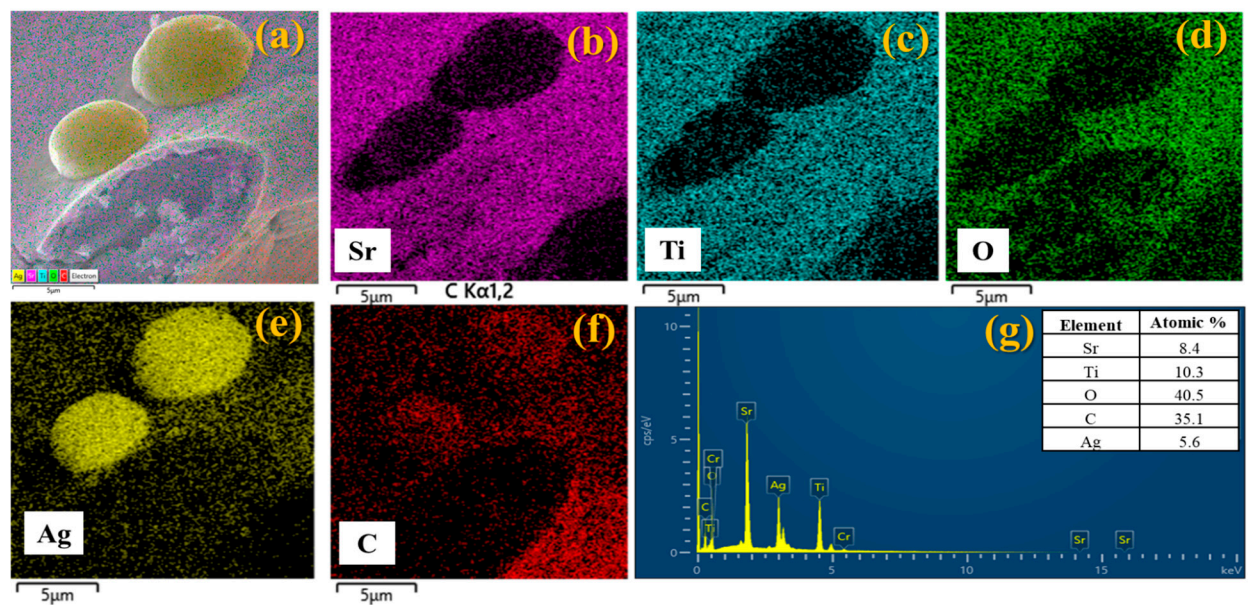


Figure S4. SEM image (a), elemental mapping of Strontium (b), Titanium (c), Oxygen (d), Silver (e), Carbon (f), and EDX spectrum (g) of 8 wt.% Ag-STO_{1100C_10h} photocatalyst.

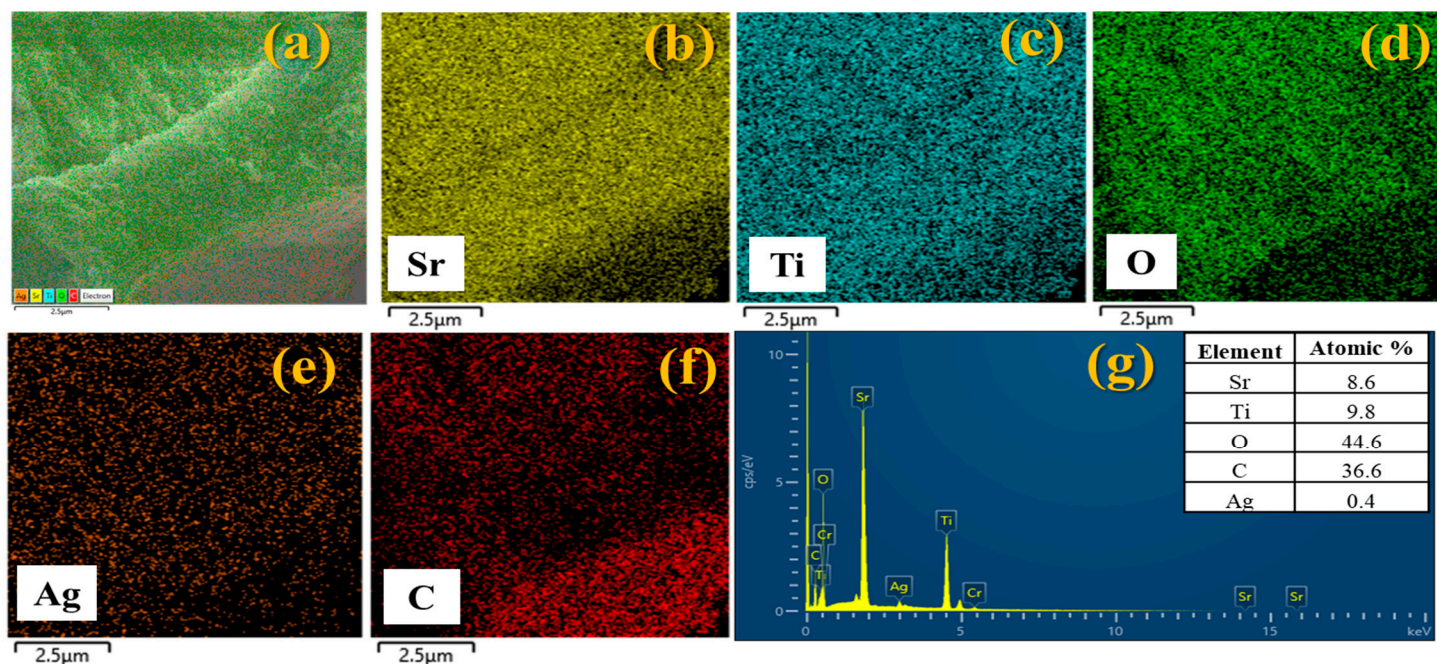


Figure S5. SEM image (a), elemental mapping of Strontium (b), Titanium (c), Oxygen (d), Silver (e), and EDX spectrum (f) of 8 wt.% Ag-STO_{1100C_15h} photocatalyst.

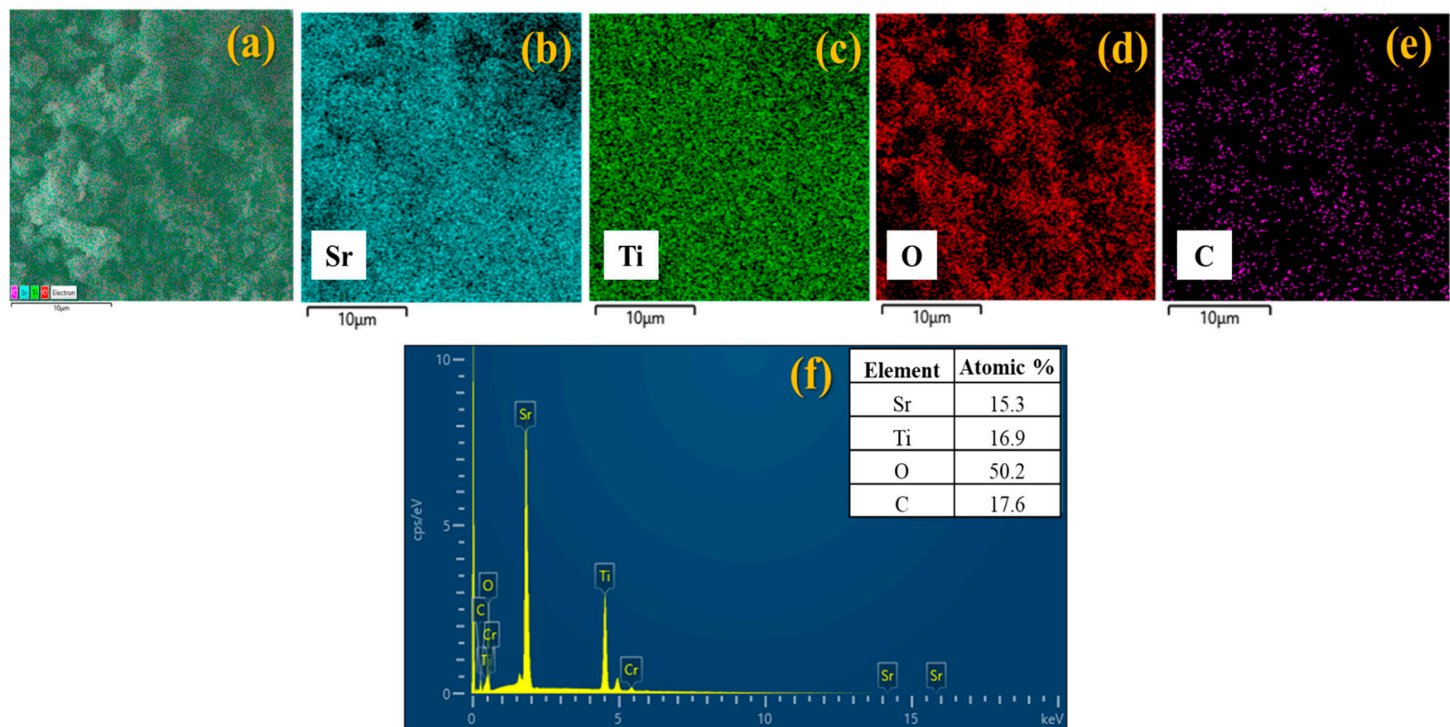


Figure S6. SEM image (a), elemental mapping of Strontium (b), Titanium (c), Oxygen (d), Carbon (e), and EDX spectrum (f) of STO (1:5) photocatalyst.

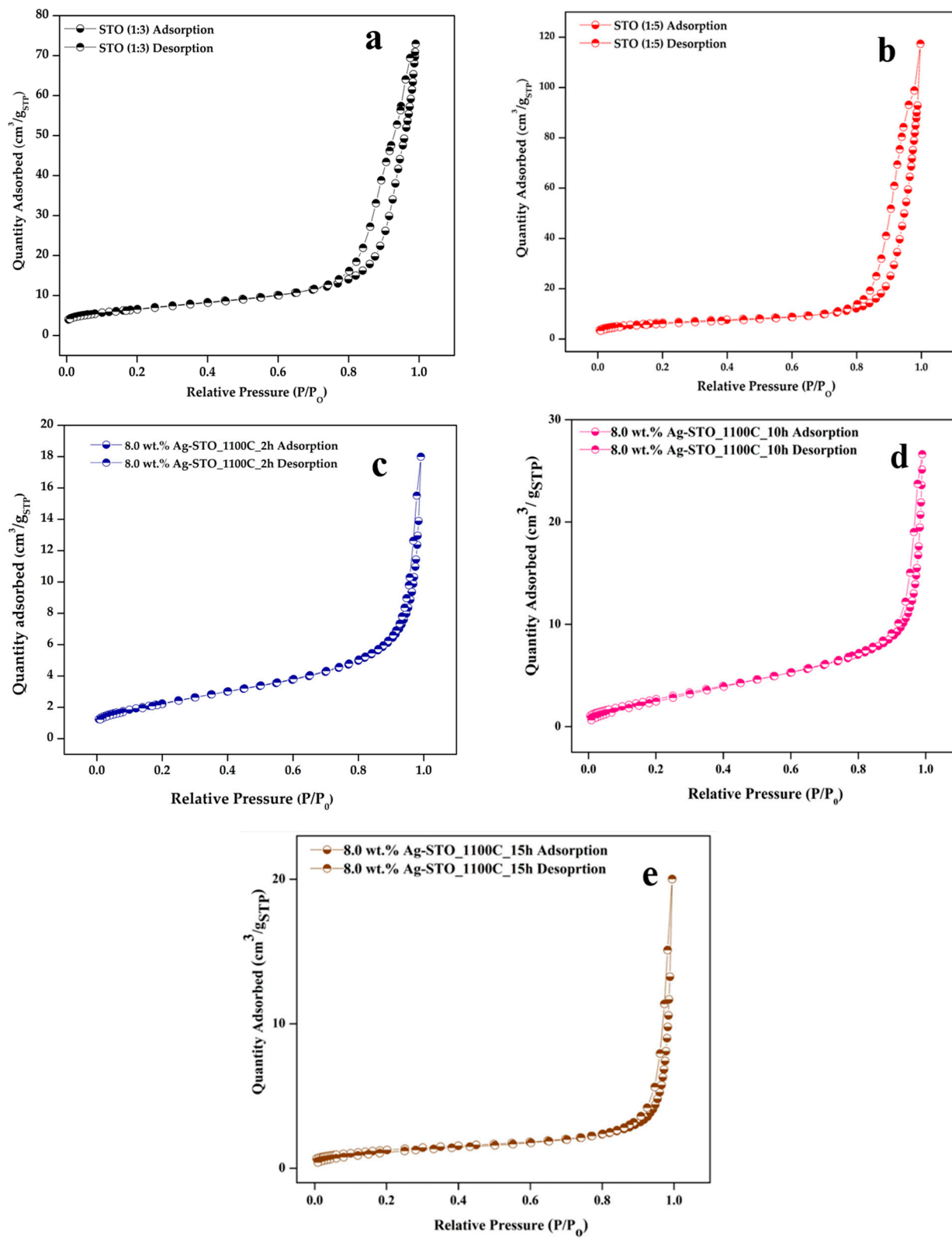


Figure S7. N_2 adsorption/desorption isotherms at -196°C ;

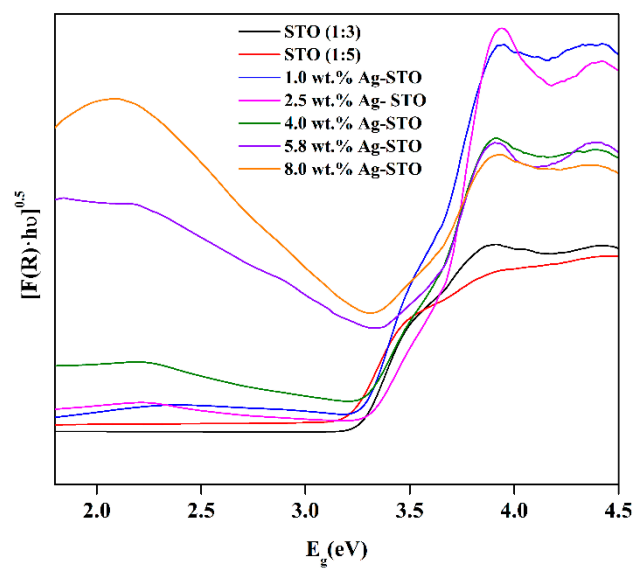


Figure S8. Tauc Plot of Ag-STO photocatalysts at 900°C.

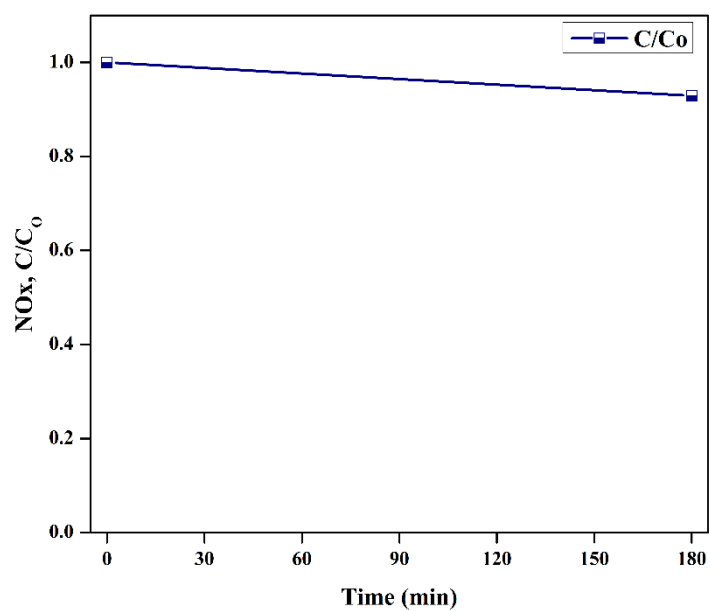


Figure S9. Photolysis study for NO_x degradation under LED light without any catalyst.

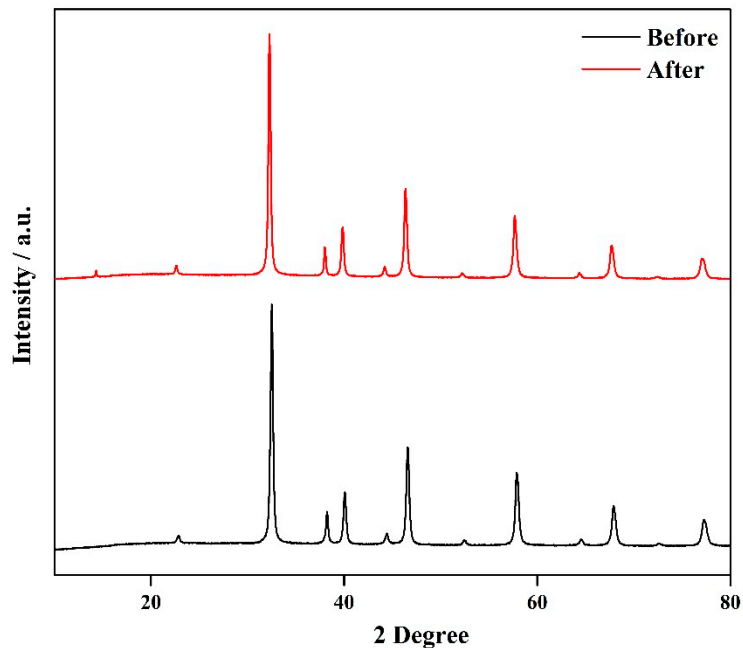


Figure S10. XRPD pattern of the 8.0 wt.% Ag-STO photocatalyst (a) before and (b) after ten successive photocatalytic reactions.

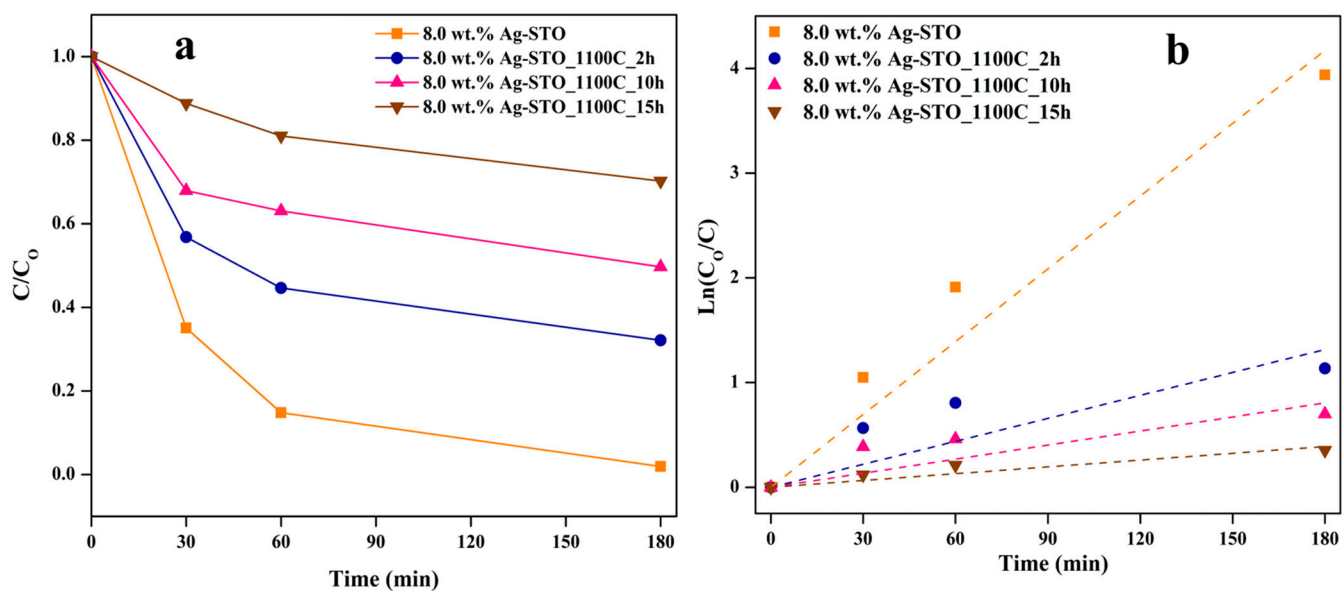


Figure S11. NO_x photocatalytic removal efficiency C/C_0 as a function of time and (b) First-order kinetic plot of 8.0 wt.% Ag-STO photocatalyst calcined at 1100°C with different heat treatment conditions.