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## Supplementary Materials

### for

# Oxygen Vacancy Enhanced Photocatalytic Activity of Pervoskite SrTiO<sub>3</sub>

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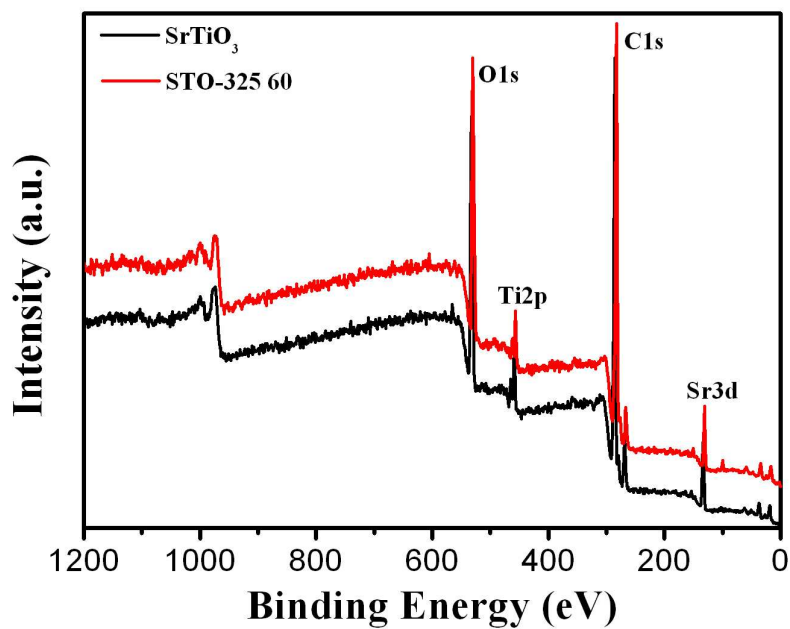
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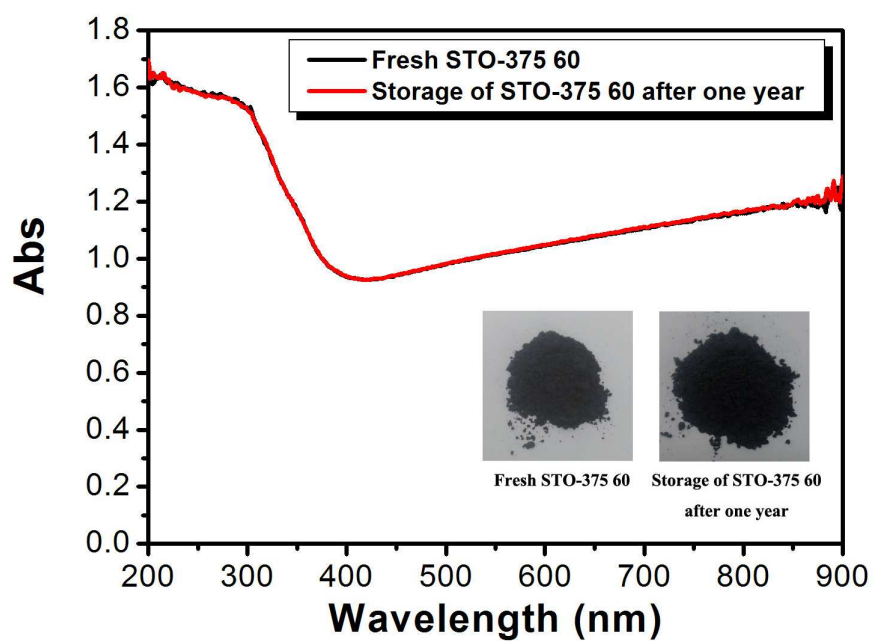
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**Figure S1.** Full XPS survey of pristine SrTiO<sub>3</sub> and STO-325 60.



**Figure S2.** (a) The diffuse reflectance UV-Vis spectra of STO-375 60 (fresh and stored for a year); (b) optical image of STO-375 60 (fresh and stored for a year).

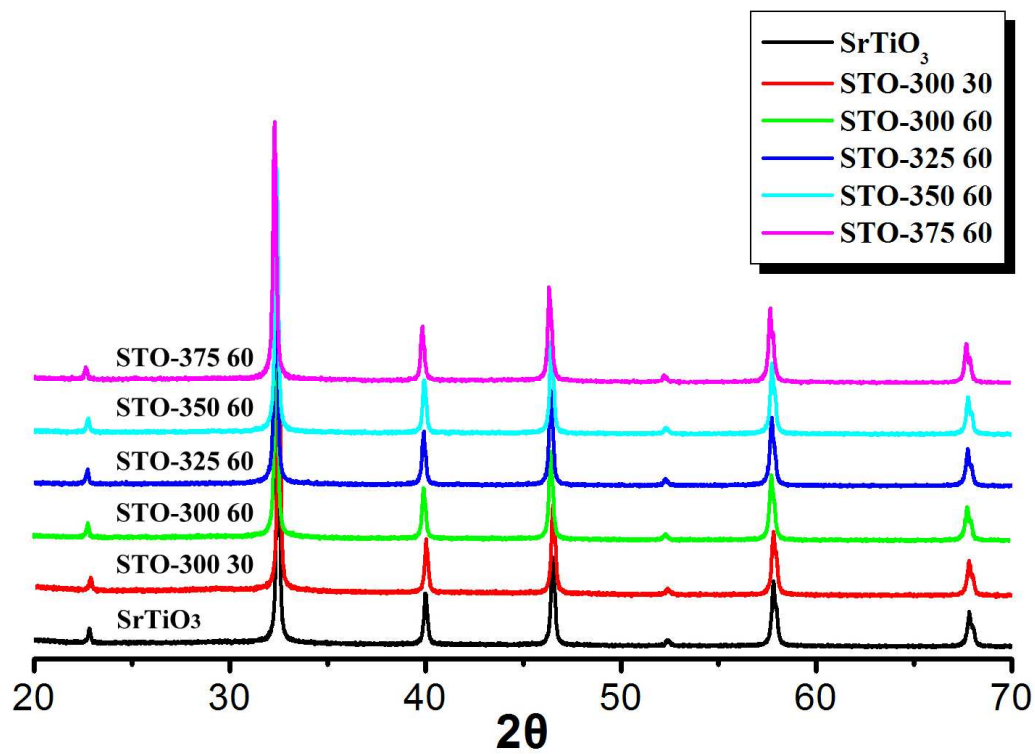
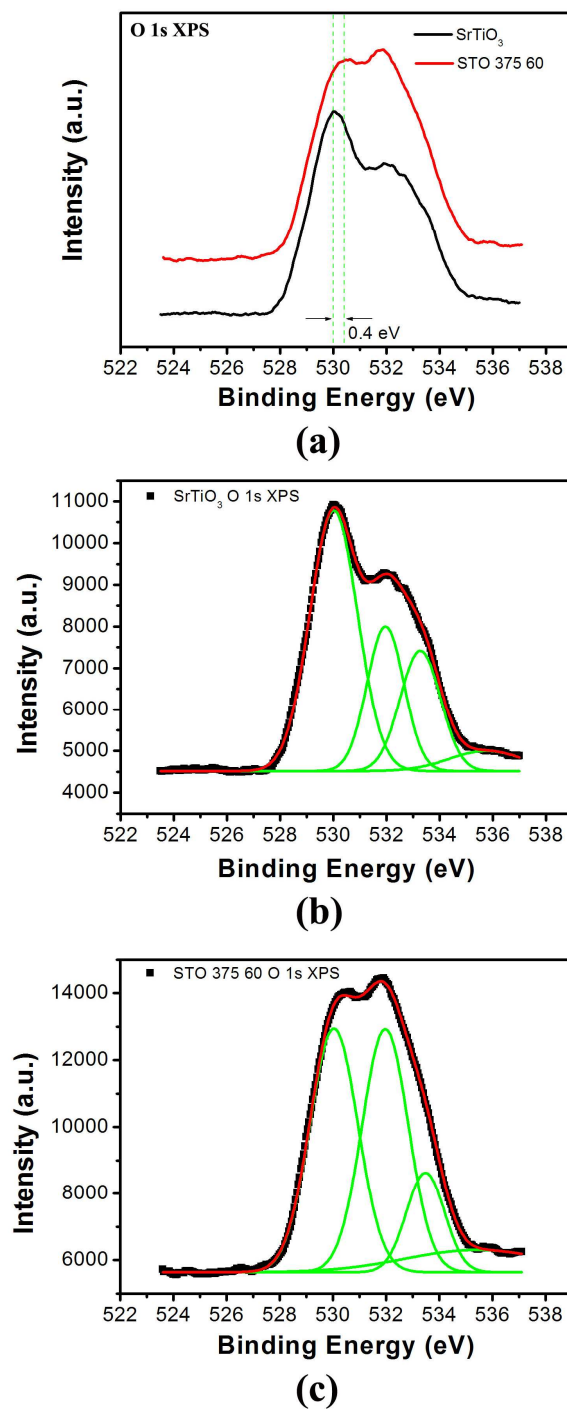
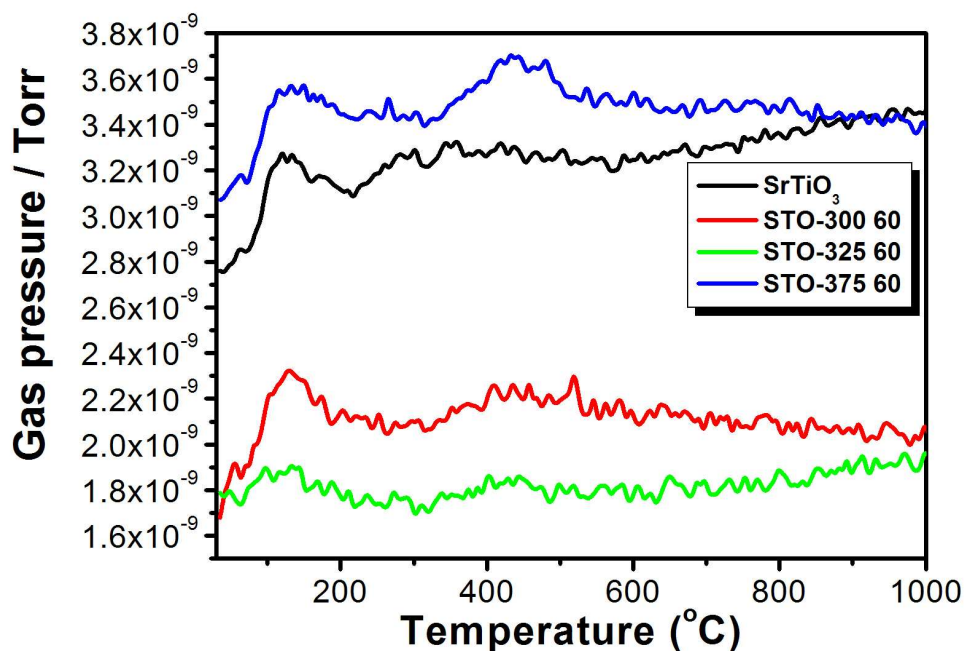


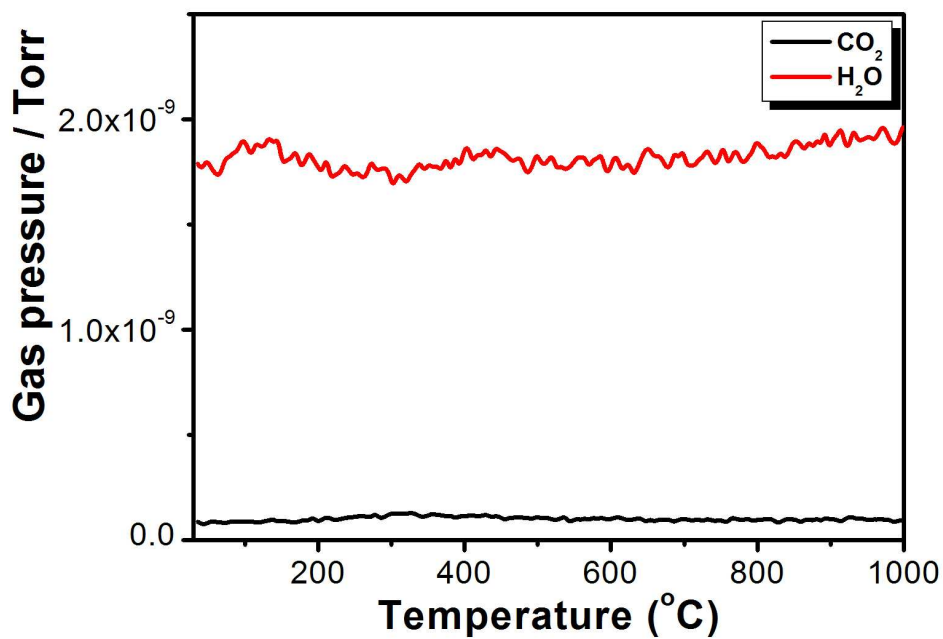
Figure S3. XRD pattern of pristine  $\text{SrTiO}_3$  and STO samples.



**Figure S4.** (a) O 1s XPS of pristine SrTiO<sub>3</sub> and STO-375 60; (b) the O 1s spectra of pristine SrTiO<sub>3</sub> can be described as the superposition of three peaks by Gaussian distribution, located around 530.0 eV, 531.9 eV and 533.4 eV, respectively; (c) the O 1s spectra of STO-375 60 can be described as the superposition of three peaks by Gaussian distribution, located around 530.0 eV, 531.9 eV and 533.4 eV, respectively.



**Figure S5.** The  $\text{H}_2\text{O}$  mass spectra monitored the gas coming out from samples during TGA measurement of pristine  $\text{SrTiO}_3$  and STO samples.



**Figure S6.** The  $\text{CO}_2$  and  $\text{H}_2\text{O}$  mass spectra monitored the gas coming out from samples during TGA measurement of STO-325 60.