nanomaterials

MDPI

Supplementary Material

Photocatalytic Overall Water Splitting by $SrTiO_3$ with Surface Oxygen Vacancies

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1. Physical Characterization

A HITACHI SU8010 scanning electron microscope equipped with a field-emission gun operated at 5.0 kV was used to characterize the morphology of the as-obtained product. The size distribution of $SrTiO_3$ and $SrTiO_3$-C950 particles was determined by Malvern laser particle size analyzer (Malvern Nano-ZS90). High-resolution transmission electron microscopy (HRTEM) was performed on a JEM-2100F instrument at an accelerating voltage of 200 kV. The powder X-ray diffraction patterns (XRD) were collected at room temperature using a scan speed of 0.1 s/step on a Bruker D8 Advance Diffractometer (40 kV, 40 mA) with Cu Kα radiation (1.5418 Å). X-ray photoelectron spectroscopy (XPS) was carried out on Thermo Scientific Escalab 250Xi with Al Kα as the excitation source. The UV/Vis diffuse reflection spectra were taken on a Shimadzu UV-2550 spectrophotometer with an integrated sphere attachment, and $BaSO_4$ was used as the reference sample. Electron paramagnetic resonance (EPR) signals were recorded on a Bruker A300-10/12/S-LC spectrometer with a frequency of 9.87 GHz at room temperature.

2. Supplementary Figures

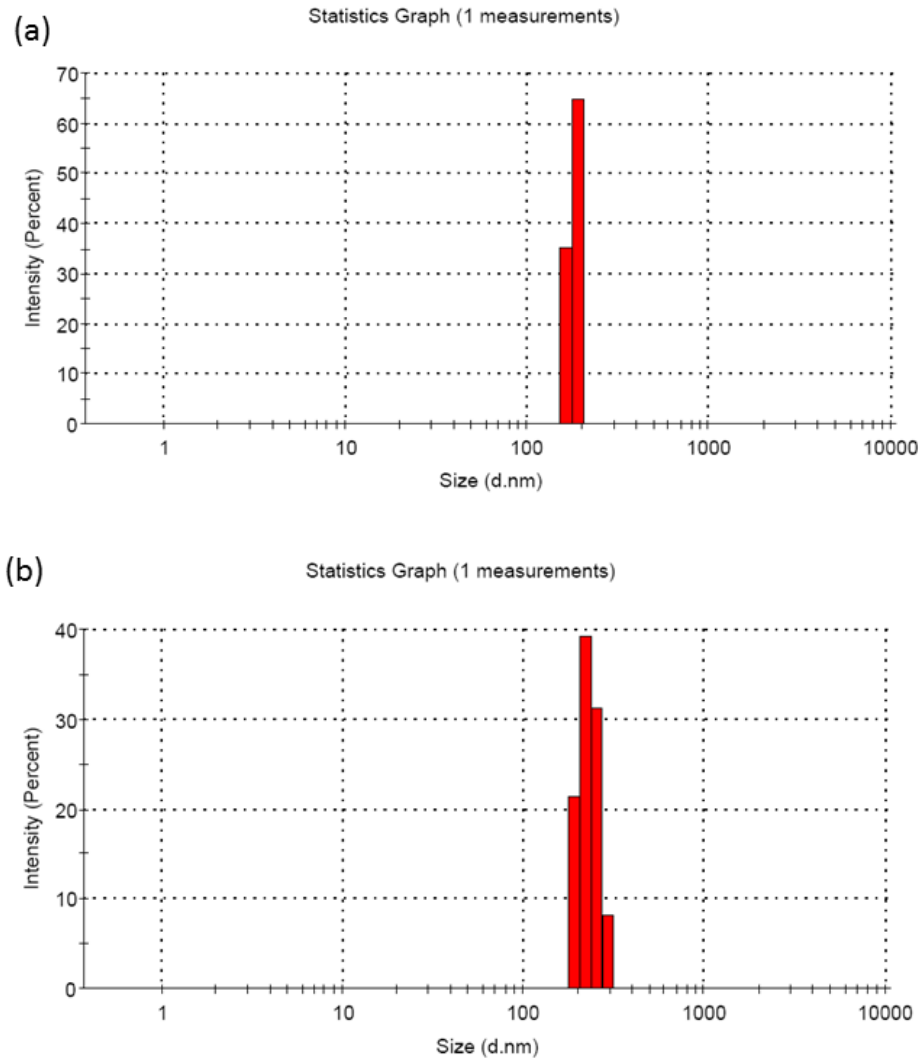

Figure S1. Particle size distribution of $SrTiO_3$ before (**a**) and after (**b**) carbon reduction process under 950 °C

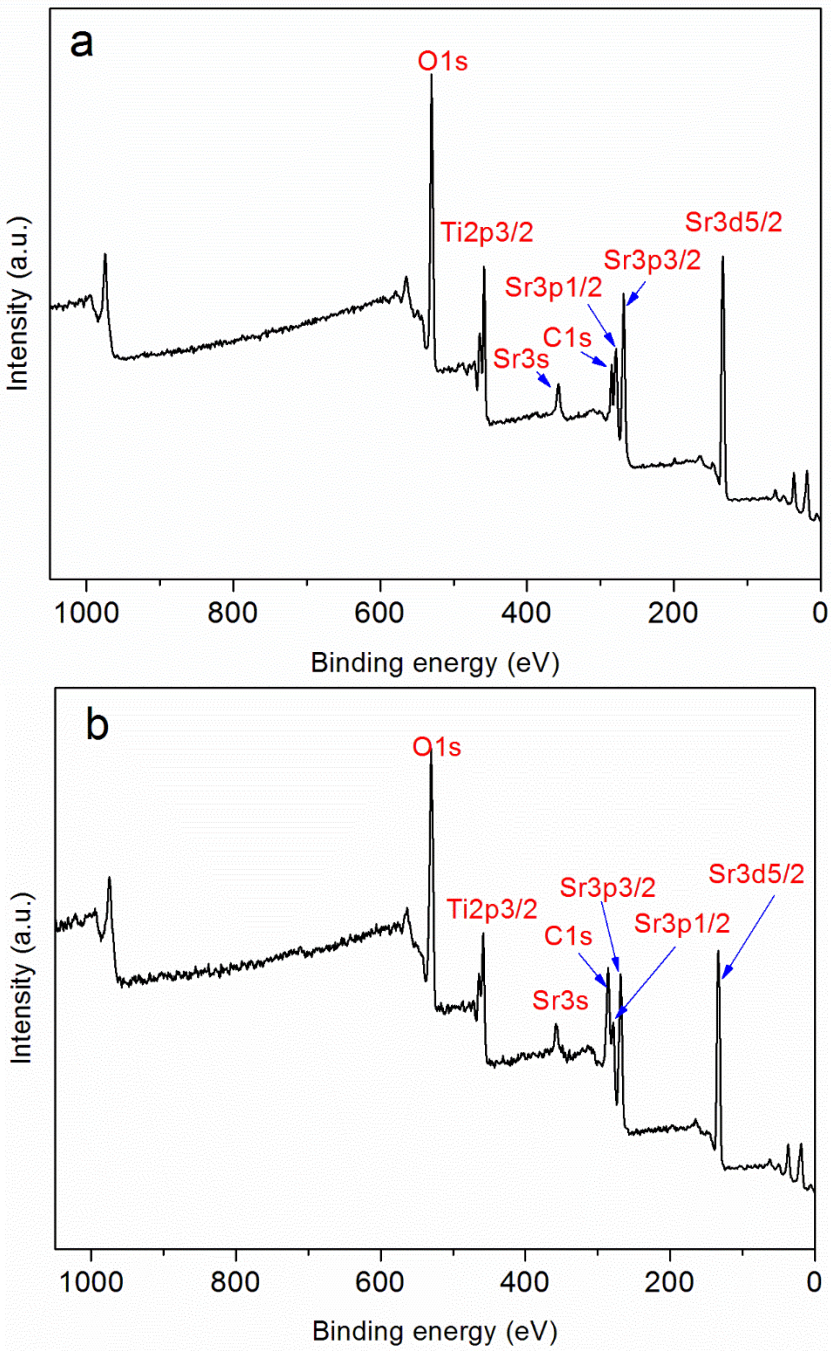

Figure S2. Survey XPS spectra of $SrTiO_3$ (**a**) and $SrTiO_3$-C950 (**b**).