

Supplementary information for:

Photocatalytic reduction Cr (VI) on 3.0%-Au/Sr_{0.70}Ce_{0.20}WO₄ photocatalyst

Jia Yang, Mingyan Fu, Mingdan Tan, Yanling Tian, Xiaorui Sun, Huisheng Huang**

Chongqing Key Laboratory of Inorganic Special Functional Materials, College of Chemistry

and Chemical Engineering, Yangtze Normal University, Fuling, Chongqing 408100, P. R. China

* Email: sunxiaoruiyznu@163.com; Tel: +86-18883876787.

* Email: h.s.huang@hotmail.com; Tel: +86-13658279645.

Table S1. A summary of the Cr (VI) reduction activities of the prepared photocatalysts in this paper.

	Formula	k (min ⁻¹)	pH
1	SrWO ₄	0.000 6 (0.6)	7
2	Sr _{0.94} Ce _{0.04} WO ₄	0.000 8 (0.4)	7
3	Sr _{0.88} Ce _{0.08} WO ₄	0.001 3 (3)	7
4	Sr _{0.82} Ce _{0.12} WO ₄	0.001 7 (2)	7
5	Sr _{0.76} Ce _{0.16} WO ₄	0.001 9 (1)	7
6	Sr _{0.70} Ce _{0.20} WO ₄	0.040 2 (73)	1
7	Sr _{0.70} Ce _{0.20} WO ₄	0.024 7 (35)	4
8	Sr _{0.70} Ce _{0.20} WO ₄	0.002 1 (0.5)	7
9	Sr _{0.64} Ce _{0.24} WO ₄	0.001 9 (1)	7
10	3.0%-Cu/ Sr _{0.70} Ce _{0.20} WO ₄	0.001 4 (1)	7
11	3.0%-Ag/ Sr_{0.70}Ce_{0.20}WO₄	0.003 9 (1)	7
12	3.0%-Au/ Sr _{0.70} Ce _{0.20} WO ₄	0.003 0 (1)	7
13	3.0%-Pt/ Sr _{0.70} Ce _{0.20} WO ₄	0.002 7 (3)	7
14	1.0%-Au/ Sr _{0.70} Ce _{0.20} WO ₄	0.002 1 (0.6)	7
15	2.0%-Au/ Sr _{0.70} Ce _{0.20} WO ₄	0.002 7 (3)	7
16	4.0%-Au/ Sr _{0.70} Ce _{0.20} WO ₄	0.002 7 (3)	7

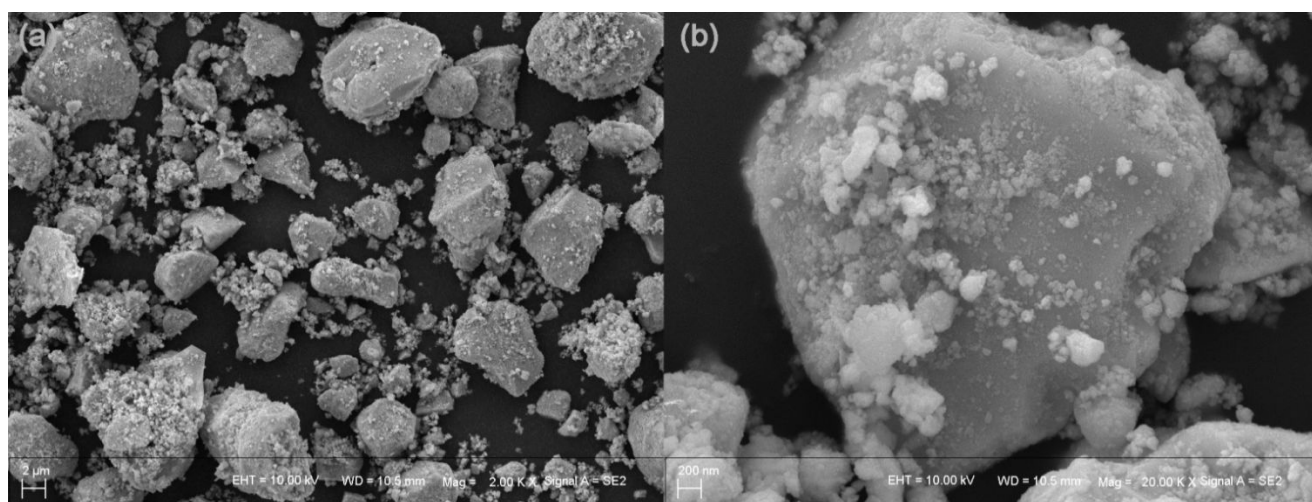


Figure S1. The SEM images of 3.0%Au/Sr_{0.70}Ce_{0.20}WO₄ sample before photocatalysis: (a) in 2 μm view; (b) in 200 nm view.

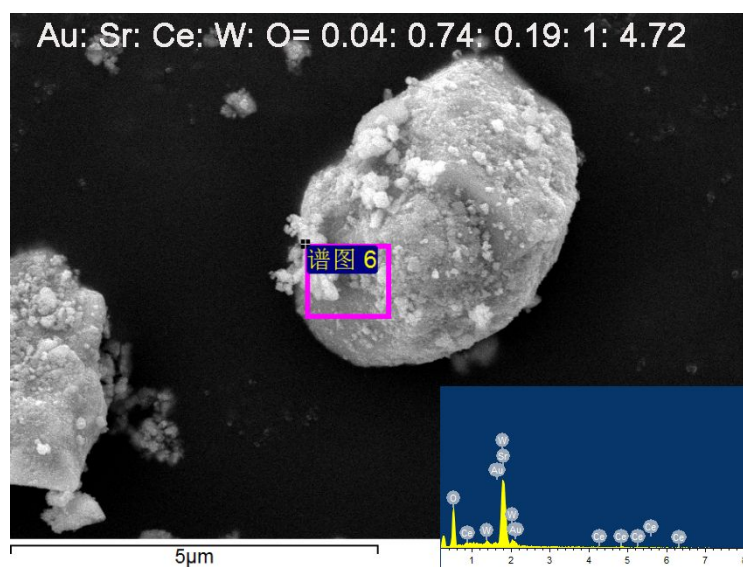


Figure S2. The EDS image of 3.0%Au/Sr_{0.70}Ce_{0.20}WO₄ sample.

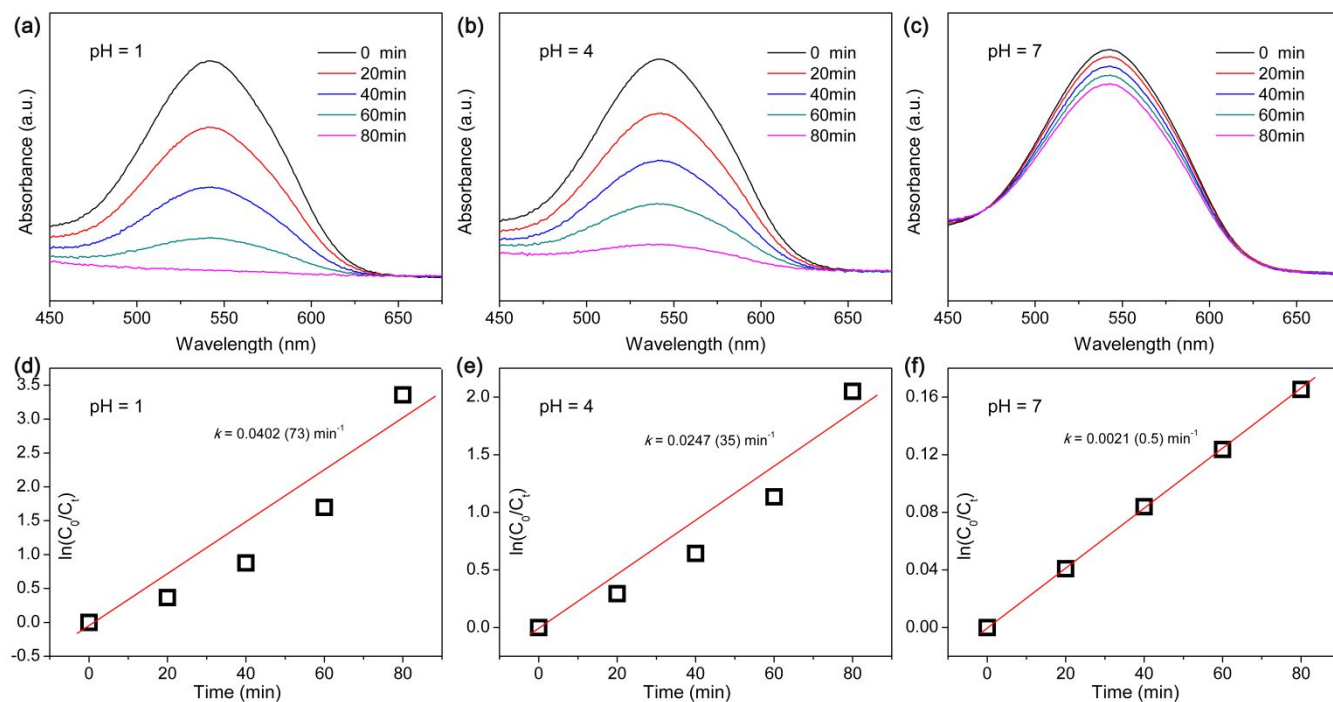


Figure S3. The absorbance of Cr (VI) solution with different concentrations over $\text{Sr}_{0.70}\text{Ce}_{0.20}\text{WO}_4$ photocatalyst at (a) pH=1, (b) pH=4, and (c) pH=7; (b) The corresponding photocatalytic reduction activities of $\text{Sr}_{1-1.5x}\text{Ce}_x\text{WO}_4$ at different pH values: (d) pH=1, (e) pH=4, and (f) pH=7. *Photocatalytic conditions: 100 mg photocatalyst, 250 mL solution, $\text{Cr}_2\text{O}_7^{2-}$ 10 ppm, 300 W long-arc xenon lamp.

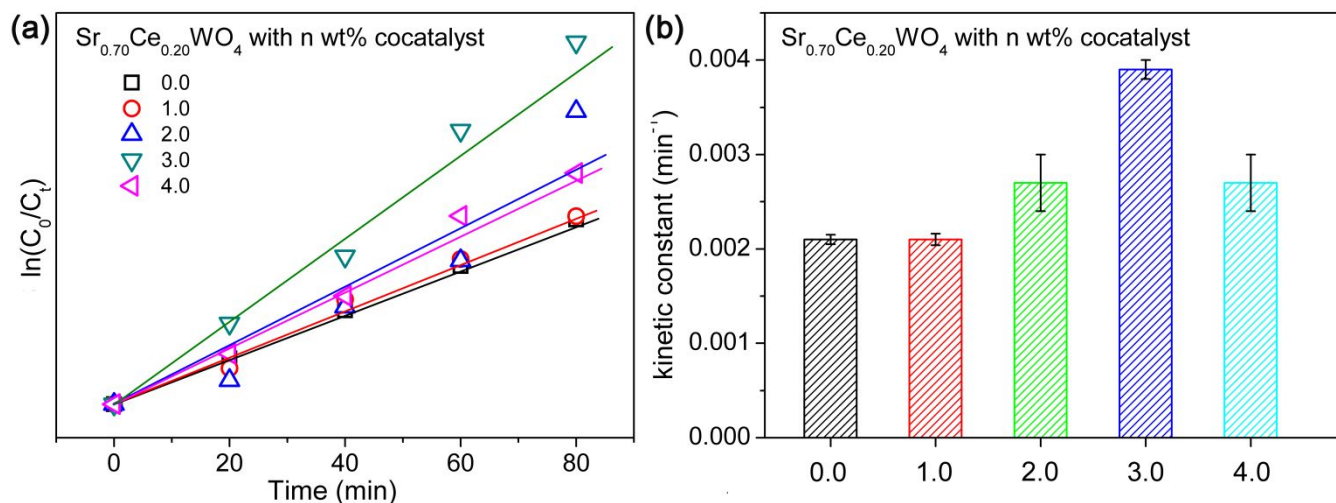


Figure S4. (a) The photocatalytic reduction activities of $\text{Sr}_{0.70}\text{Ce}_{0.20}\text{WO}_4$ with different amounts of Au-cocatalyst against times; (b) The First-order kinetic constants of photocatalytic Cr(VI) reduction over $\text{Sr}_{0.70}\text{Ce}_{0.20}\text{WO}_4$ with different amount of Au-cocatalyst under simulated sunlight irradiation. *Photocatalytic conditions: 100 mg photocatalyst, 250 mL solution, $\text{Cr}_2\text{O}_7^{2-}$ 10 ppm, pH=7, 300 W long-arc xenon lamp.

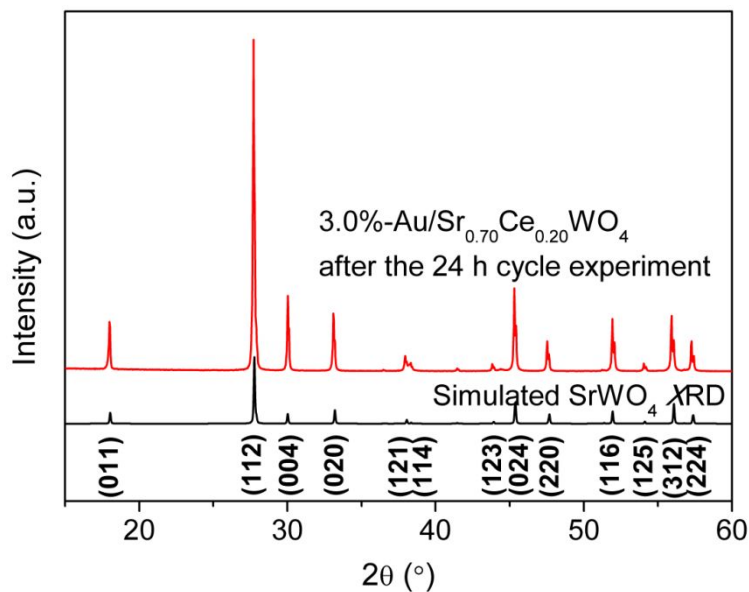


Figure S5. The XRD pattern of 3.0%-Au/Sr_{0.70}Ce_{0.20}WO₄ sample which after the cyclic experiment.

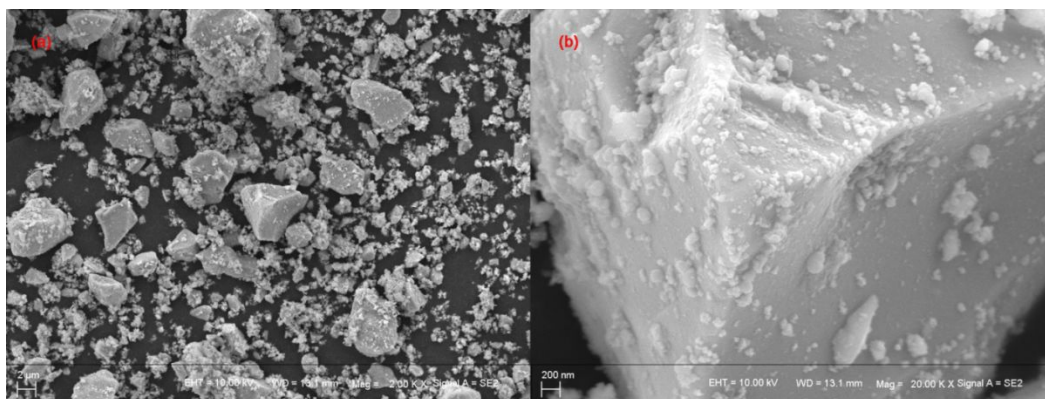


Figure S6. The SEM images of 3.0%-Au/Sr_{0.70}Ce_{0.20}WO₄ sample after photocatalysis: (a) in 2 μ m view; (b) in 200 nm view.

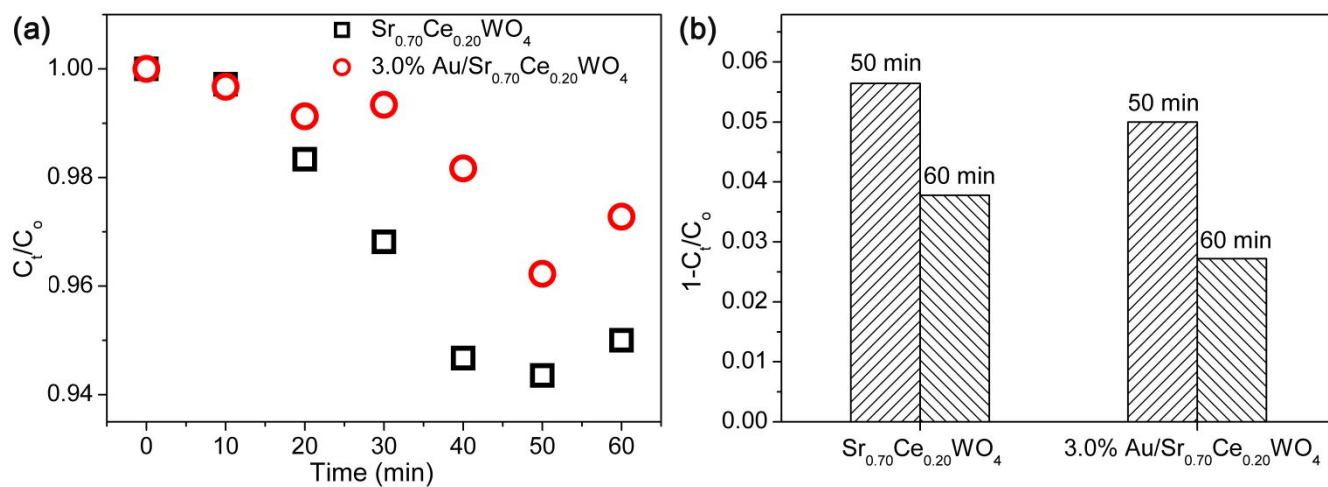


Figure S7. (a) The adsorption-desorption experiment on the Sr_{0.70}Ce_{0.20}WO₄ and 3.0%-Au/Sr_{0.70}Ce_{0.20}WO₄ samples; (b) The adsorption performances of the Sr_{0.70}Ce_{0.20}WO₄ and 3.0%-Au/Sr_{0.70}Ce_{0.20}WO₄ samples.