Supporting Information

Synthesis of Template-Free Magnetite nanospheres fabricated on Sb$_2$WO$_6$ hierarchical structures for Sunlight-Driven Photo-Fenton Catalysis of organic pollutants

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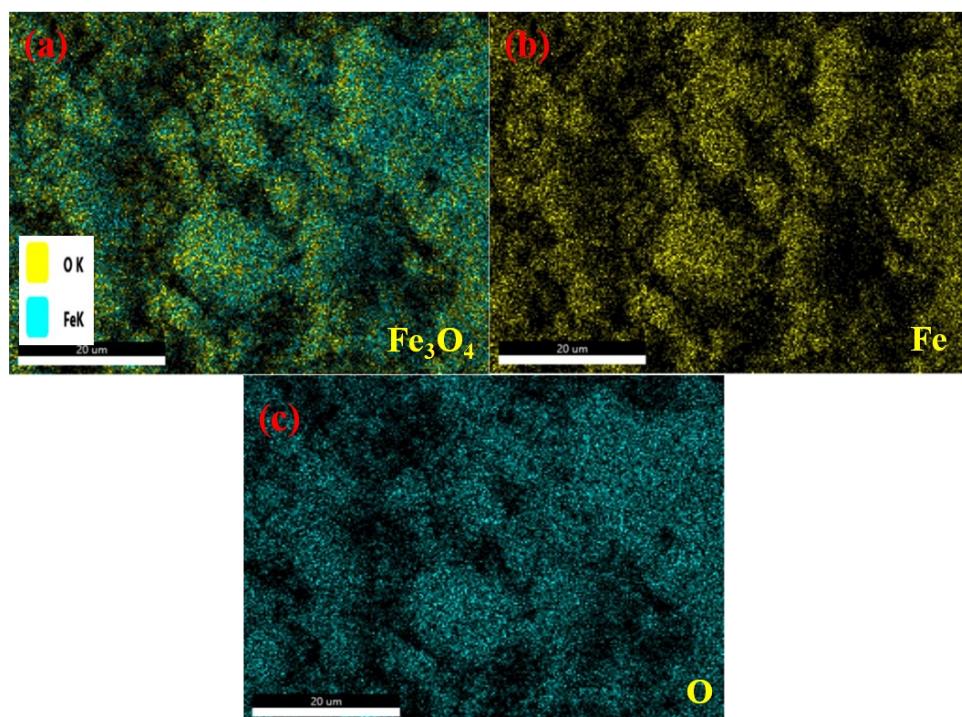
Figure S1. (A) Elemental mapping images of Fe$_3$O$_4$.

CRFC | New Sample | Area 5 | Live Map 1

O Kα1

14.4K

12.8K

11.2K

9.6K

8.0K

6.4K

4.8K   Fe Lα1

3.2K

1.6K

0.0K
      0.0   1.3   2.6   3.9   5.2   6.5   7.8   9.1   10.4   11.7   13.0

Fe Kα1

Fe Kβ1

Det: Octane Elect Plus

Element	Weight %
Fe K	36.0
O K	64.0
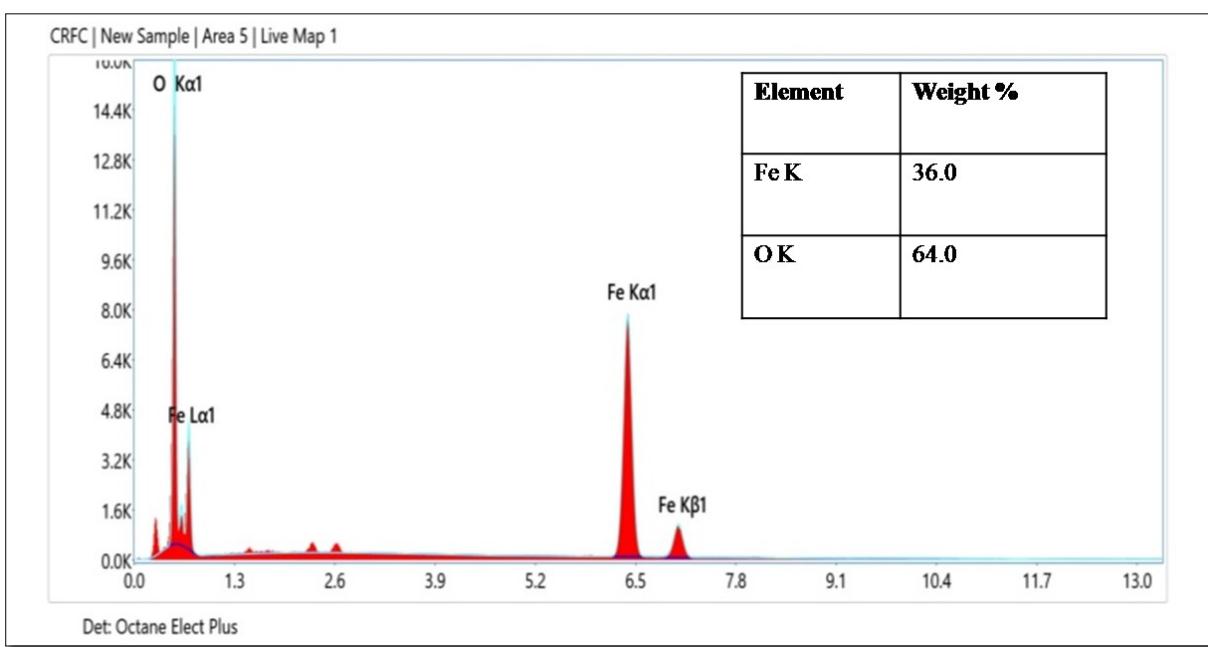
Figure S1. (B) EDS spectra of Fe_3O_4.
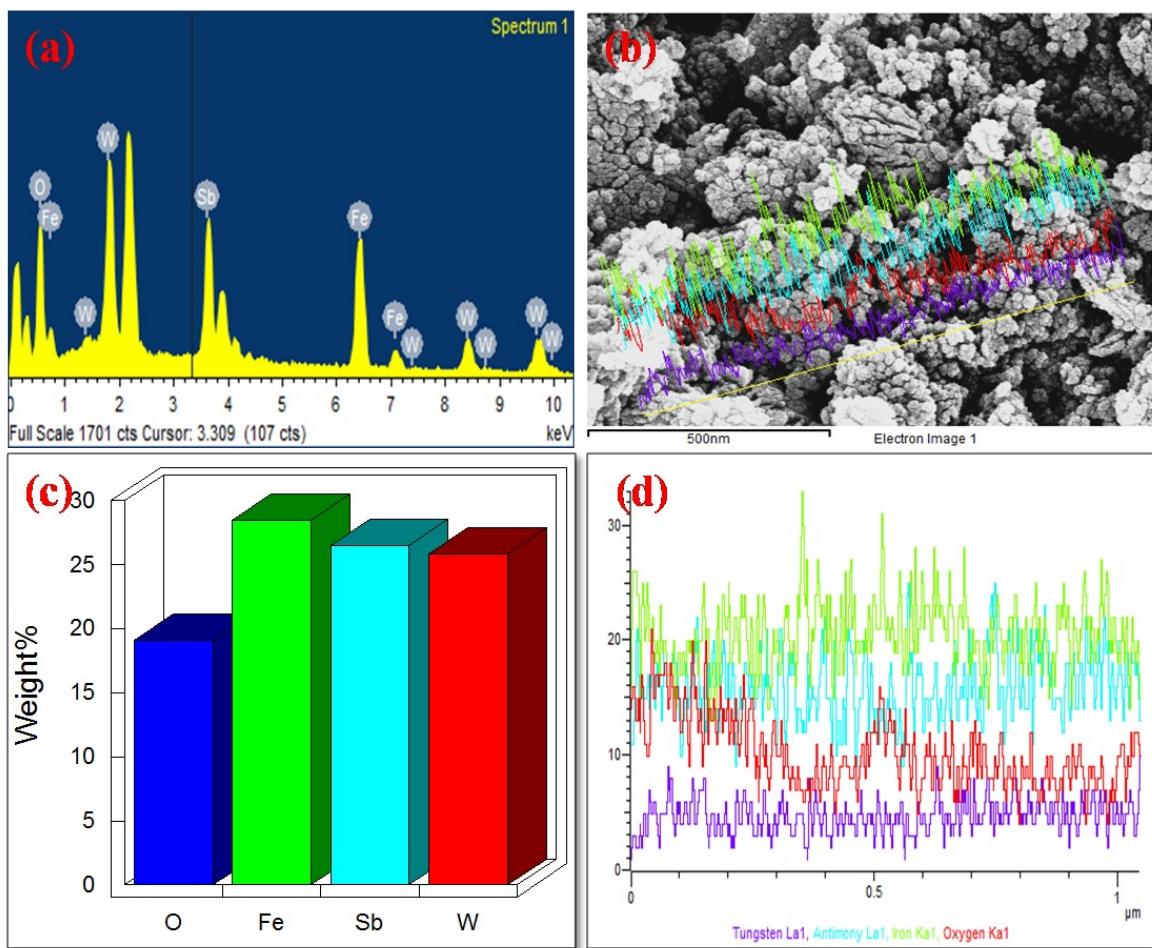
Figure S1. (C) EDS spectra of Fe_3O_4/Sb_2WO_6 (a); SEM micrograph of Fe_3O_4/Sb_2WO_6 (b); weight percentage of respective elements in Fe_3O_4/Sb_2WO_6 (c); vibrational spectra from respective elements in SEM micrographs.
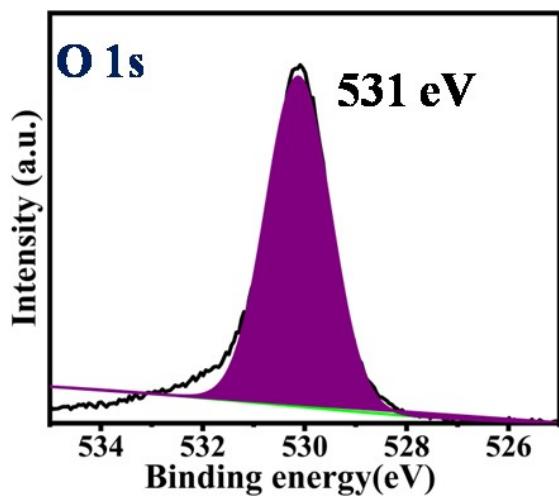

Figure. S2: Deconvoluted XPS spectra of oxygen.

No.	Systems	K (min^{-1})	R-Square
1	MB+Fe$_3$O$_4$/ Sb$_2$WO$_6$+H$_2$O$_2$	0.06607 ± 9.03747	0.998
2	MB+Fe$_3$O$_4$/ Sb$_2$WO$_6$	0.04675 ± 0.00101	0.988
3	MB+Fe$_3$O$_4$+H$_2$O$_2$	0.05574 ± 5.9591	0.975
4	MB+Fe$_3$O$_4$/ Sb$_2$WO$_6$	$0.02313 \pm 8.42724E-4$	0.973
5	MB+Sb$_2$WO$_6$	0.02212 ± 0.00295	0.971
6	MB+Fe$_3$O$_4$	0.02588 ± 0.00391	0.984
7	MB+H$_2$O$_2$	0.02487 ± 0.00523	0.981

Figure. S3: The kinetic parameters of different reaction systems.
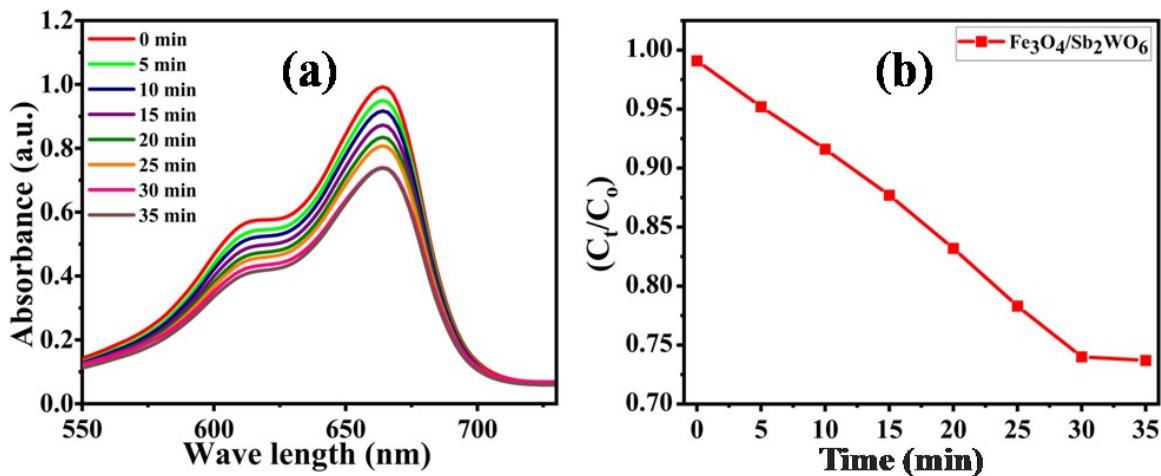
Figure. S4: (a) Adsorption spectra of [MB] =2.5 ppm, [Fe$_3$O$_4$/Sb$_2$WO$_6$] = 4 mg/L, pH = 3);

(b) Ct/Co vs time calibration plot of MB

No.	Kinetic Models	k	R-Square
1	zero-order	0.00027 ± 2.01343	0.955
2	first-order	0.06607 ± 9.03747	0.998
3	second-order	0.00165 ± 6.00478	0.972

Figure. S5: The parameters of three kinetic models.

Time (min)	COD (ppm)	TOC (ppm)
0	141.2	224.24
5	120.12	147.85
10	73.14	90.34
15	48.35	50.12
20	32.25	36.39
25	19.99	20.43
30	12.64	12.53
35	8.82	2.31

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Figure. S6: Chemical oxygen demand (COD) and Total organic carbon (TOC) of Methylene Blue against Fe_3O_4/Sb_2WO_6 photocatalysts
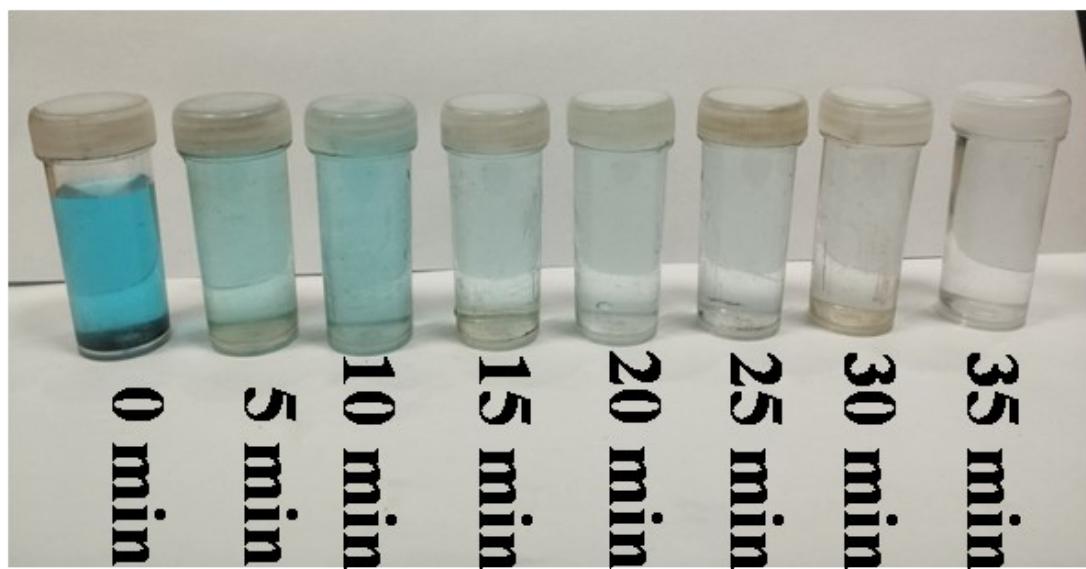

Figure. S7: Change in colour depth during dye degradation.