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## (Electronic Supplementary Information)

# Adsorptive photo-Fenton-like removal of 1,2-benzisothiazolin-3-one by NH<sub>2</sub>-MIL-53(Fe) under simulated solar light

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### Text S1

### **Characterization of material**

X-ray photoelectron spectroscopy (XPS) was performed to analyze the Surface electronic states by PHI 5000 Versa Probe III with a monochromatic Al K $\alpha$  X-ray source with the beam size of 200 um. Charge compensation was achieved by the dual beam charge neutralization and the binding energy was corrected by setting the binding energy of the hydrocarbon C 1s feature to 284.8 eV.

Three electrode system used by electrochemical workstation (CHI 760E) was consist of counter electrode (Pt plate), reference electrode (Ag/AgCl) and working electrode (ITO). The electrolyte used was 0.5 M Na<sub>2</sub>SO<sub>4</sub>. And the reference electrode needs to be replaced by SCE in Mott-Schottky test and experiment frequency was 1000, 1500 and 2000 Hz.

The trapping agent for 'OH was DMPO (solvent: water), that for  $O_2$ <sup>--</sup> and was DMPO (solvent: methanol) and the h<sup>+</sup> was TEMPO (solvent: methanol) in Electron spin resonance (ESR) test.



**Fig. S1**. The fitting curves of three adsorption models of Langmuir (a), Freundlich (b), and Temkin (c) model.



**Fig. S2** (a) The TOC removal efficiency of NH<sub>2</sub>-MIL-53(Fe)/H<sub>2</sub>O<sub>2</sub>/Light corresponding Fig.2, (b) the pseudo first order kinetics diagram of NH<sub>2</sub>-MIL-53(Fe)/H<sub>2</sub>O<sub>2</sub>/Light



Fig. S3. The SEM images of MIL-53(Fe) size of 10  $\mu$ m (a), analysis of different elements content of NH<sub>2</sub>-MIL-53(Fe) surface (b), the EDS mappings of C (c), Fe (d), O (e), of MIL-53(Fe).



Fig. S4. The XPS spectra of MIL-53(Fe): the survey spectrum (a), High-resolution C 1s

(b), High-resolution Fe 2p (c), High-resolution O 1s (d).



Fig. S5 Pore size distribution curves of NH<sub>2</sub>-MIL-53(Fe)



Fig.S6 The mass spectrum of the intermediates generated in BIT degradation process.



Fig.S7 The XPS spectra of NH<sub>2</sub>-MIL-53(Fe): High-resolution C 1s (a), High-resolution O 1s (d), High-resolution Fe 2p (c), High-resolution N1s (d).

Photocatalysts	Xenon	Pollutants concentration	Catalyst concentration	$\rm H_2O_2$ dosage	Removal efficiency
	lamp (W)	(mg/L)	(mg/L)	(mM)	(%)
GWM-200, <sup>1</sup>	300	20	1000	10	82.3
$Bi_{3.64}Mo_{0.36}O_{6.55}/$	300	20	100	23	82.7
CuBi <sub>2</sub> O <sub>4</sub> <sup>2</sup>					
C-doped ZnFe <sub>2</sub> O <sub>4</sub> <sup>3</sup>	300	20	500	20	90.8
NH <sub>2</sub> -MIL-53(Fe) (this	300	40	100	15	90.6
work)					

Table. S1 Comparison of photo-Fenton degradation effect in different photocatalytic systems

#### Reference

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