

Supporting information

Heterogeneous Fenton-like Catalysis of Fe-MOF derived Magnetic Carbon Nanocomposites for Degradation of 4-Nitrophenol

Dezhi Chen^a, Shasha Chen^a, Shasha Xie^a, Yijie Jiang^a, Hongying Quan^b, Li Hua^a,

Xubiao Luo^{a*} and Lin Guo^{a,c}

^a Key Laboratory of Jiangxi Province for Persistent Pollutants Control and Resources Recycle, School of Environmental and Chemical Engineering, Nanchang Hangkong University, No. 696, Fenghe South Avenue, Nanchang, 330063, China.

^b School of Materials Science and Engineering, Nanchang Hangkong University, No. 696, Fenghe South Avenue, Nanchang 330063, China.

Table S1 Summary of BET surface areas, total pore volume and pore size calculated from nitrogen isotherms for the obtained MIL-88-Fe-x. (x=400, 450, 500, 550, 600)

Samples	BET Surface Area(m ² /g)	Total pore volume(cm ³ /g)	Average Pore Size(nm)
Fe-C ₄₀₀	49.1094	0.104012	8.47187
Fe-C ₄₅₀	42.9603	0.126614	11.78889
Fe-C ₅₀₀	86.6838	0.182011	8.39883
Fe-C ₅₅₀	171.2443	0.419783	9.80548
Fe-C ₆₀₀	88.9648	0.252081	11.33396

Table S2. The elements in the surface of Fe-C_x composites by XPS results.

Atom%	Iron	Oxygen	Carbon	chlorine	Nitrogen
Fe-MOF	5.47	27.82	60.47	4.84	1.40
Fe-C ₄₀₀	4.78	17.88	72.07	4.12	1.15
Fe-C ₄₅₀	3.03	13.23	79.56	3.06	1.12
Fe-C ₅₀₀	2.83	9.87	84.10	2.73	0.47
Fe-C ₅₅₀	1.11	4.93	92.42	1.04	0.51
Fe-C ₆₀₀	1.33	5.07	93.11	0.34	0.15

Table S3. Speculated main components of Fe-C_x at different pyrolysis temperature

Speculated main components	
Fe-MOF	Fe ₃ (O)Cl[C ₆ H ₄ (CO ₂) ₂] ₃ (C ₃ H ₇ NO)
Fe-C ₄₀₀	Fe ₃ (O)Cl _i [C ₆ H ₄ (CO ₂) _{2-n}] _{3-j} (C _{3-m} N)
Fe-C ₄₅₀	Fe _{3-m} (O)Cl _i [C ₆ H ₄ (CO ₂) _{2-n}] _{3-j} (C _{3-m} N), γ-Fe ₂ O ₃ and amorphous carbon
Fe-C ₅₀₀	Fe _{3-m} (O)Cl _i [C ₆ H ₄ (CO ₂) _{2-n}] _{3-j} (C _{3-m} N), γ-Fe ₂ O ₃ and amorphous carbon
Fe-C ₅₅₀	γ-Fe ₂ O ₃ , Fe ₃ O ₄ and amorphous carbon
Fe-C ₆₀₀	Fe ₃ O ₄ and amorphous carbon

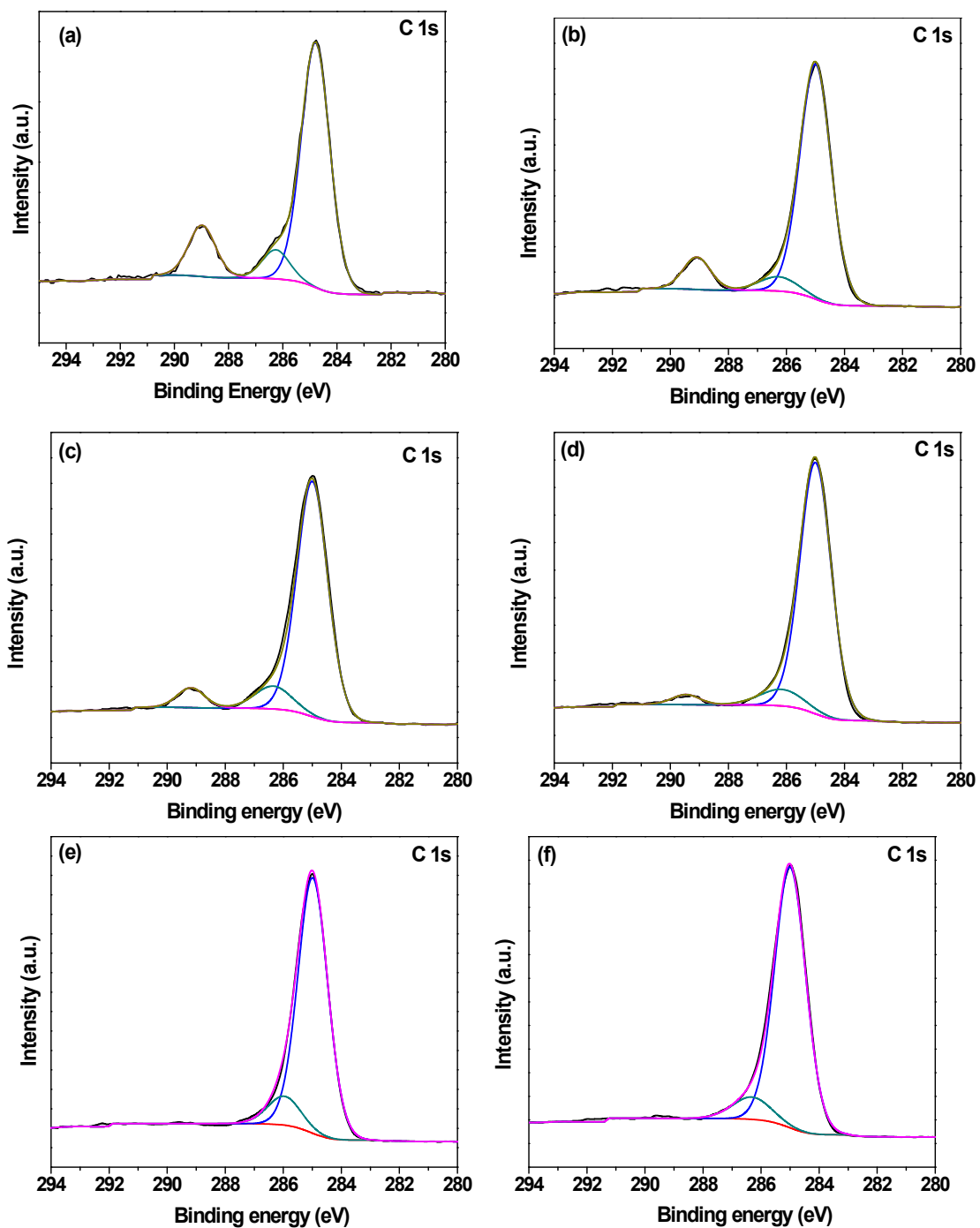


Figure S1. C 1s spectra of a) Fe-MOF, b) Fe-C₄₀₀, c) Fe-C₄₅₀, d) Fe-C₅₀₀, e) Fe-C₅₅₀, d) Fe-C₆₀₀.

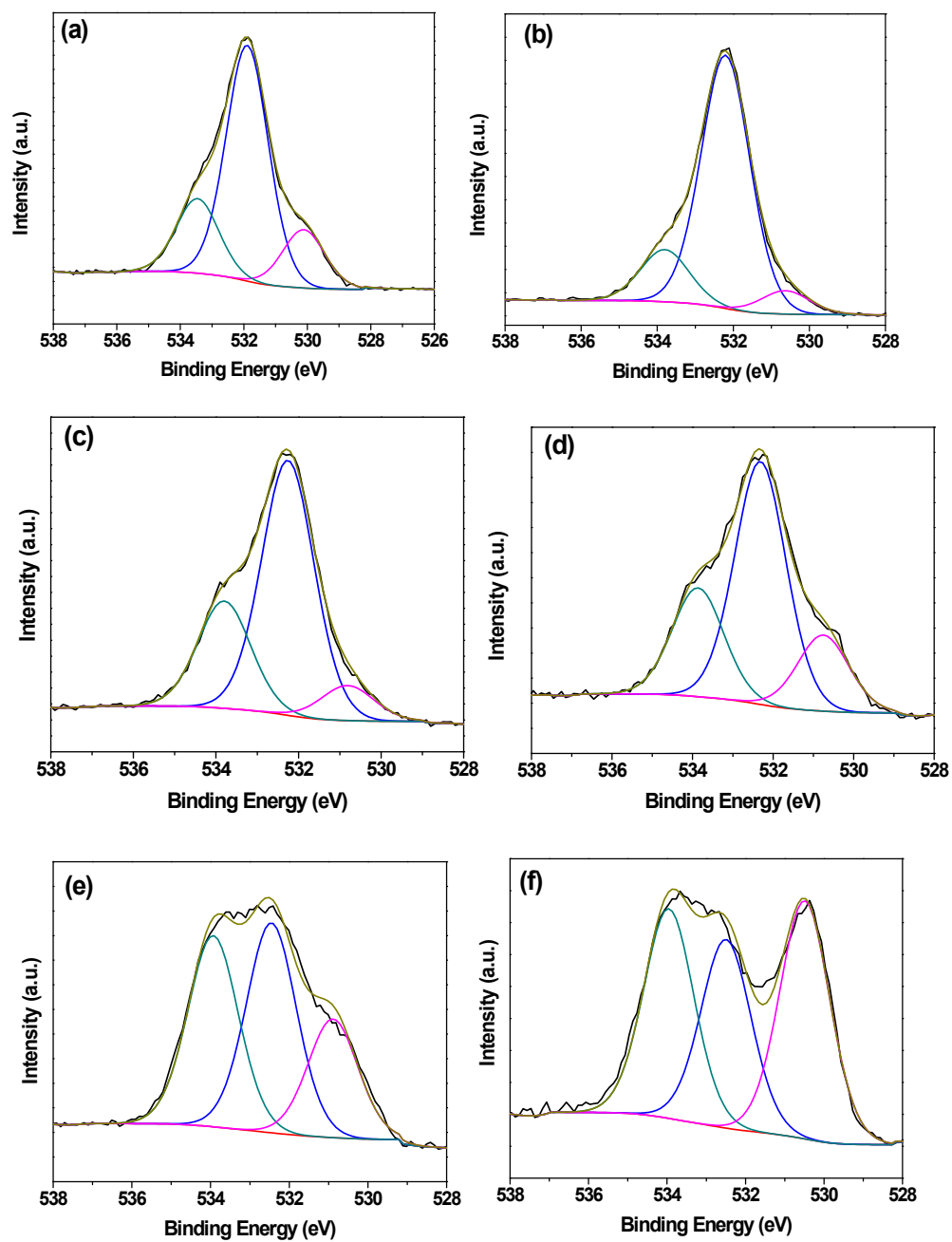


Figure S2. O 1s spectra of a) Fe-MOF, b) Fe-C₄₀₀, c) Fe-C₄₅₀, d) Fe-C₅₀₀, e) Fe-C₅₅₀, f) Fe-C₆₀₀.

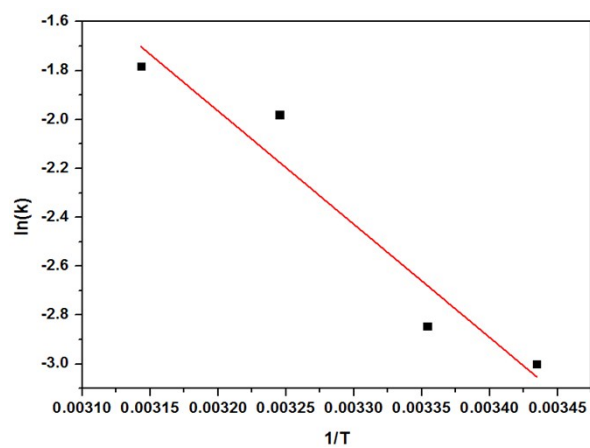


Figure S3. Arrhenius linear plot of the degradation of 4-NP by Fe-C₅₀₀



Figure S4. Recycling of Fe-C₅₀₀ by using a magnet after 4 cycles.