Synergistic Mechanism of FeS_2/ACFs Self-standing Membrane in Highly Efficient Electro-Fenton Degradation: Carbon Nanodefects and Free Radicals Analysis

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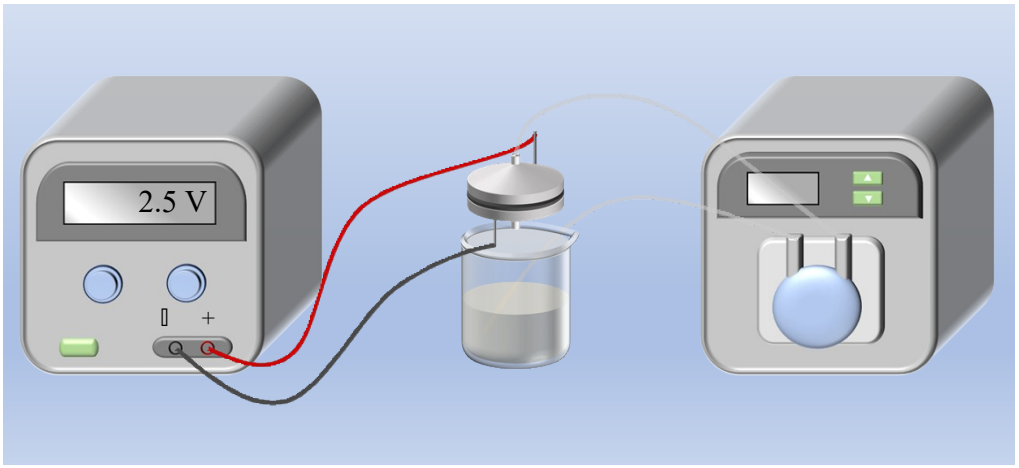

Figure S1 Schematic diagram of an electro-Fenton reaction device

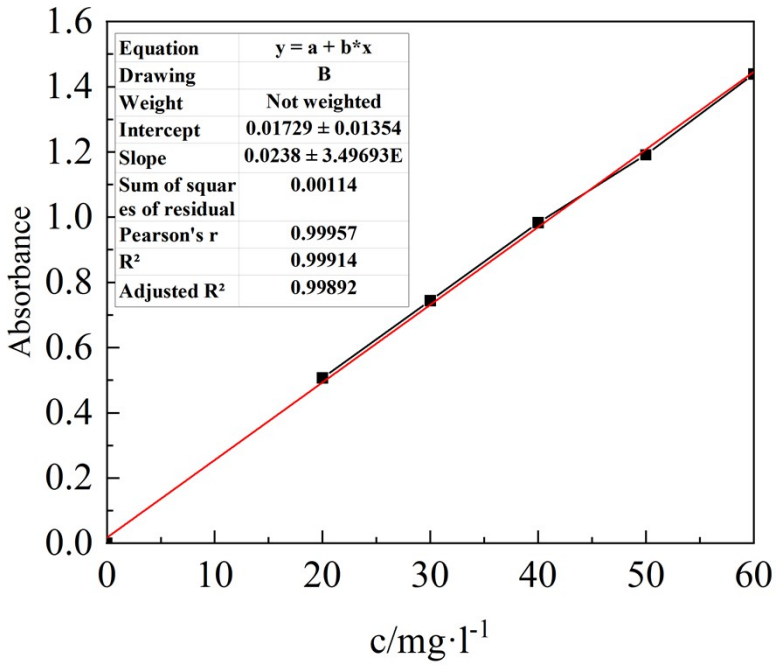

Figure S2 TC standard curve

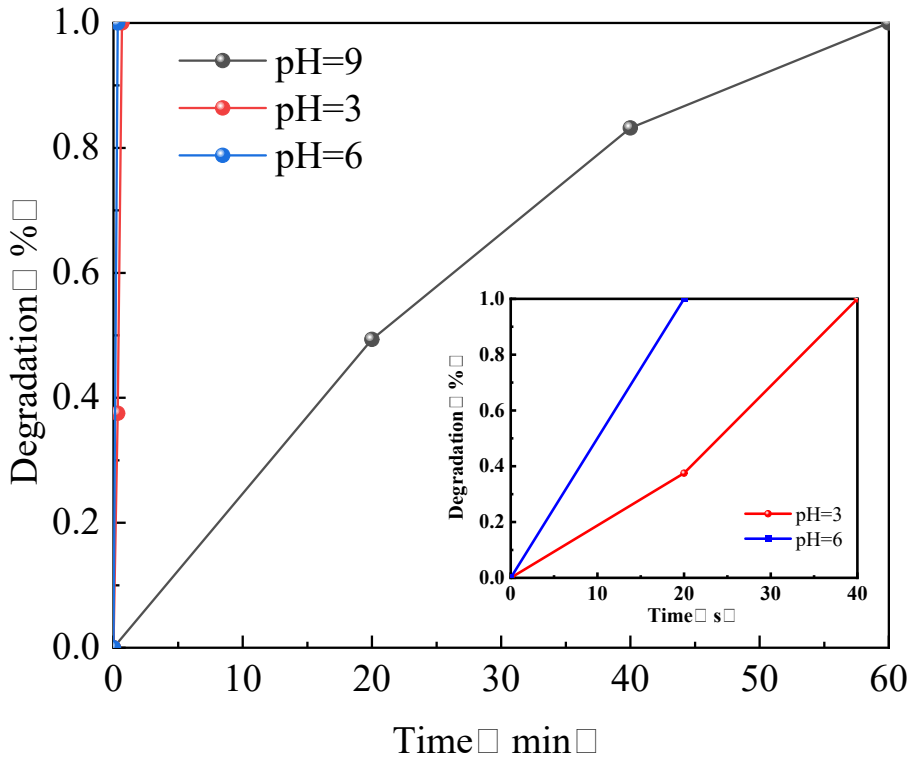

Figure S3 Schematic representation of the effect of different pH on TC degradation

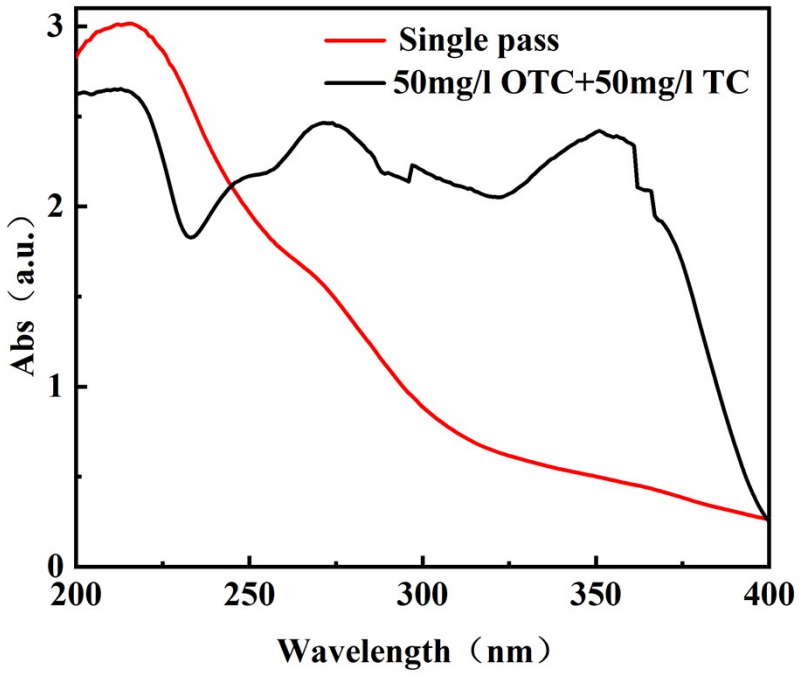

Figure S4 UV-Vis spectra before and after a single passage of 50 mg/l OTC+TC mixed solution through FeS_2/ACFs membrane

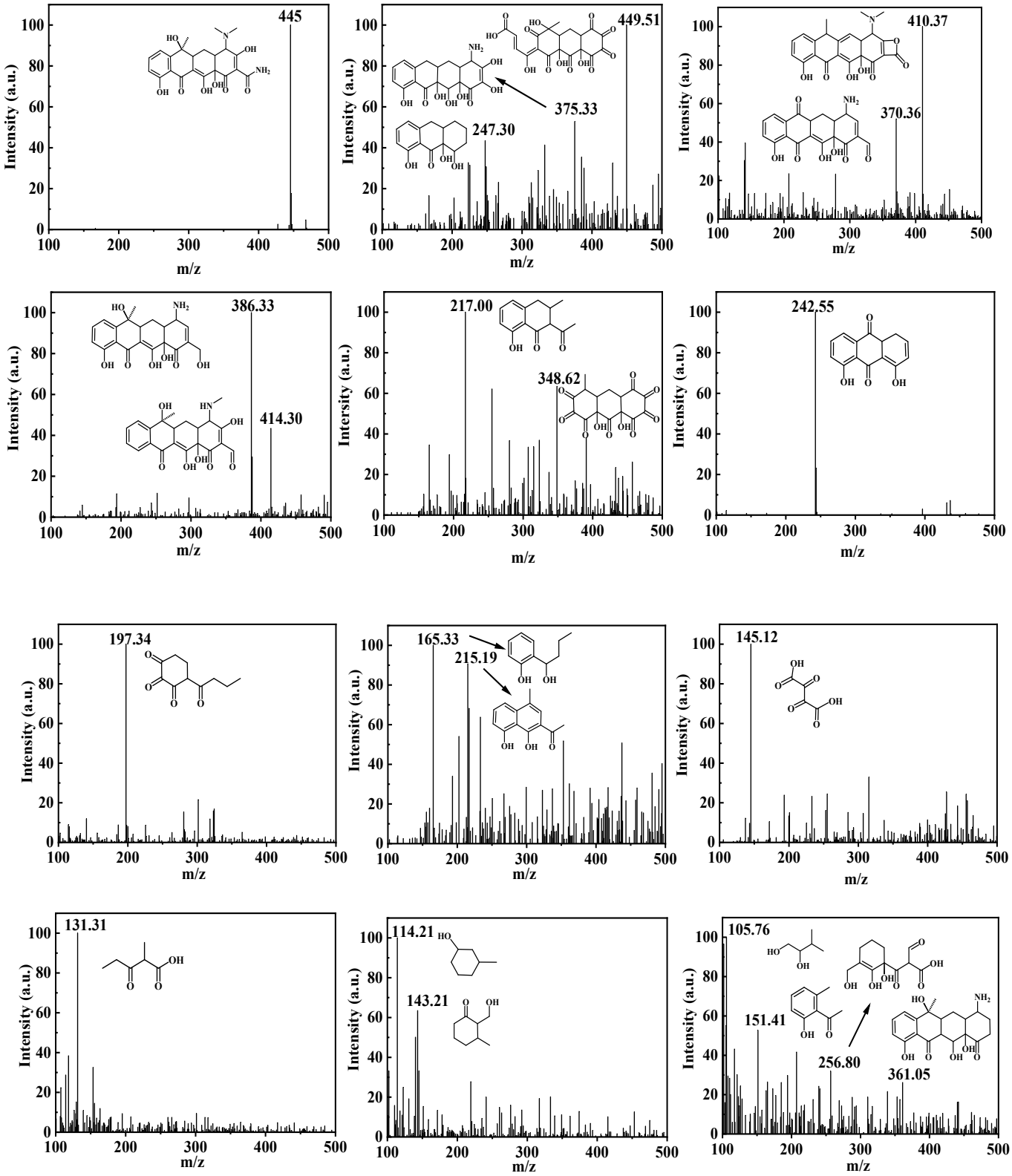

Figure S5 Possible TC degradation intermediates

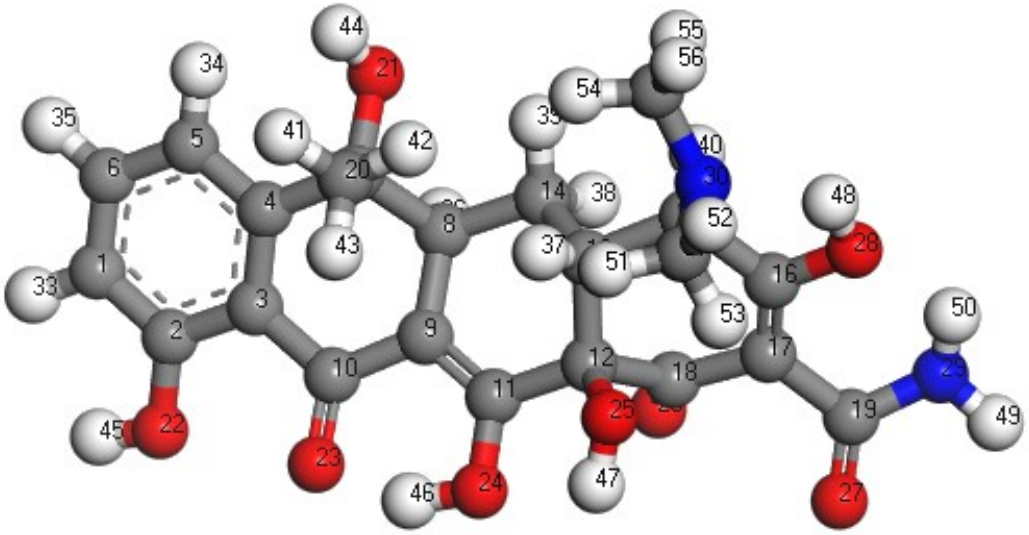

Fig. S6 Schematic diagram of TC structure and atomic number

Table S 1 Elemental content in FeS_2/ACFs

electrode	C/%	Fe/%	S/%
FeS_2/C/ACFs	79.70	7.53	12.77

Table S 2 Comparison table between FeS_2/ACFs and other jobs

Cathode	Anode	H_2O_2 concentration (mmol/l)/air pumping speed	catalyst loading (mmol/l)	Degradation time and efficiency	Reference
NAC-1000/GF	Pt	1.765	0.5	83.07% in 120 min	[1]
CNT	Fe	0.887	-	97.21% in 25 min	[2]
CF	Ti/RuO_2–IrO_2	1 l/min	0.1	＞95% in 60 min	[3]
MnFe-LDH@BC	Pt	0.5 l/min	-	94.2% in 500 min	[4]
Fe-GAC（particles）		5.5	0.693	92.6% in 60 min	[5]
ZIF-8/ACFs	Pt	0.6 l/min	0.6	100% in 20 min	[6]
Ti	Ru-Ir Ti	0.15 l/min	1.79	82.7% in 60 min	[7]
FeS_2/ACFs	Ti	20	-	100% single pass	This work

Table S 3 Fukui function calculation of TC

	Atom	f^-	f^+	f^0		Atom	f^-	f^+	f^0
1	C	0.007	0.016	0.011	33	H	0.024	0.056	0.04
2	C	0.01	0.04	0.025	34	H	0.017	0.05	0.034
3	C	-0.003	0.001	-0.001	35	H	0.025	0.061	0.043
4	C	0	0.038	0.019	36	H	0.021	0.025	0.023
5	C	0.002	0.007	0.005	37	H	0.032	0.007	0.019
6	C	0.009	0.051	0.03	38	H	0.002	0.023	0.012
7	C	-0.002	-0.011	-0.007	39	H	0.026	0.027	0.026
8	C	-0.01	-0.006	-0.008	40	H	0.03	0.014	0.022
9	C	0.025	0	0.013	41	H	0.024	0.025	0.025
10	C	0.01	0.088	0.049	42	H	-0.003	0.03	0.014
11	C	-0.02	0.073	0.026	43	H	0.001	-0.002	-0.001
12	C	-0.004	-0.01	-0.007	44	H	0.012	0.017	0.014
13	C	-0.006	-0.005	-0.005	45	H	0.014	0.029	0.021
14	C	-0.009	-0.013	-0.011	46	H	0.011	0.021	0.016
15	C	-0.007	-0.006	-0.006	47	H	0.02	0.011	0.016
16	C	0.043	0.01	0.026	48	H	0.022	0.012	0.017
17	C	0.01	0.004	0.007	49	H	0.048	0.017	0.033
18	C	0.022	0.001	0.011	50	H	0.038	0.007	0.023
19	C	0.026	0.003	0.014	51	H	0.015	-0.004	0.006
20	C	-0.005	-0.008	-0.007	52	H	0.032	0.022	0.027
21	O	0.003	0.015	0.009	53	H	-0.005	0.005	0
22	O	0.005	0.022	0.014	54	H	0.016	-0.007	0.004
23	O	0.034	0.089	0.062	55	H	0.016	0.01	0.013
24	O	0.008	0.069	0.038	56	H	0.028	0.021	0.024
25	O	0.064	0.024	0.044					
26	O	0.151	0.008	0.08					
27	O	0.135	0.011	0.073					
28	O	0.03	0.017	0.024					
29	N	0.039	0.007	0.023					
30	N	0	0.003	0.001					
31	C	-0.014	-0.008	-0.011					
32	C	-0.016	-0.008	-0.012					

Reference:

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