Supporting Information

Design of novel Fuel Cell-Fenton system: a smart approach to zero energy depollution

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1. Physical characterization of CF@Au anode

1.1. CF@Au anode before use in Fuel Cell-Fenton system

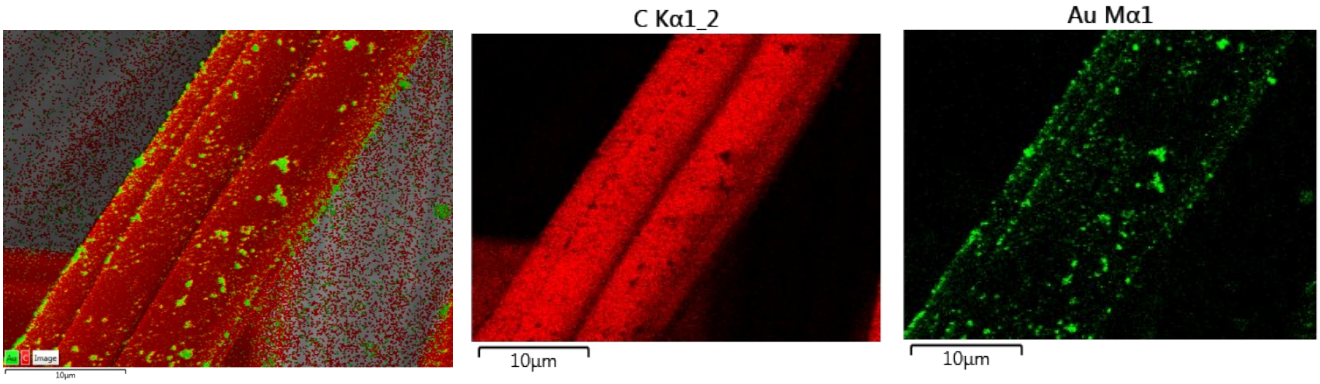

Figure S1. EDX mapping of carbon and gold elements on the surface of CF@Au anode.

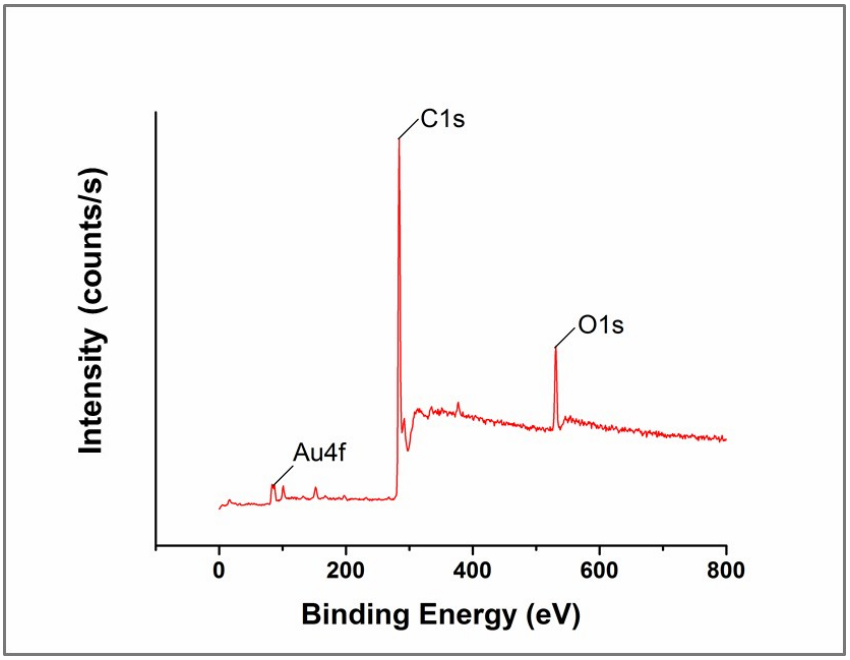

Figure S2. XPS spectrum of CF@Au anode.

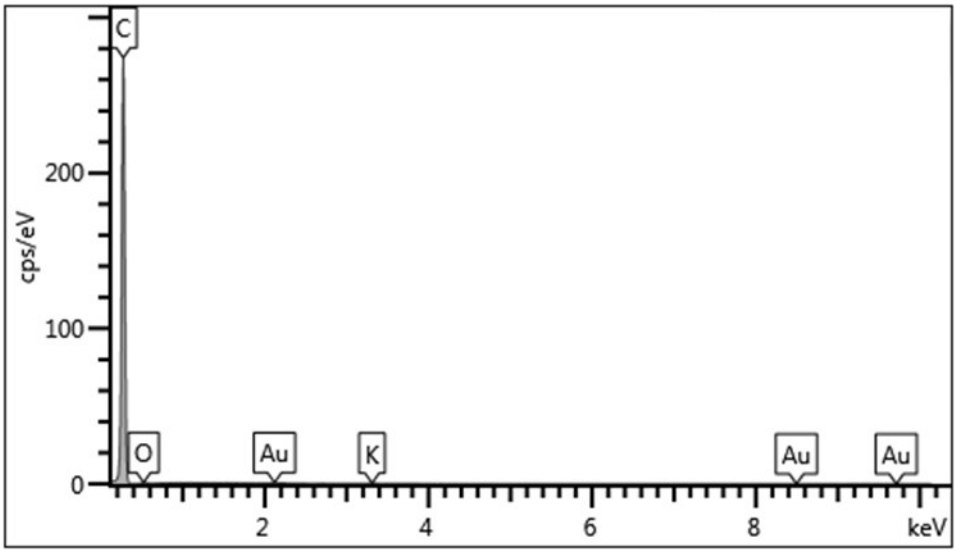

Figure S3. EDX analysis of CF@Au anode.

Table S1 – Elemental composition of CF@Au anode (from EDX analysis)

Element	% Mass	% Atomic
C	98.81	99.49
O	0.57	0.43
K	0.17	0.05
Au	0.44	0.03
Total:	100.00	100.00

1.2. CF@Au anode after two months use in Fuel Cell-Fenton system

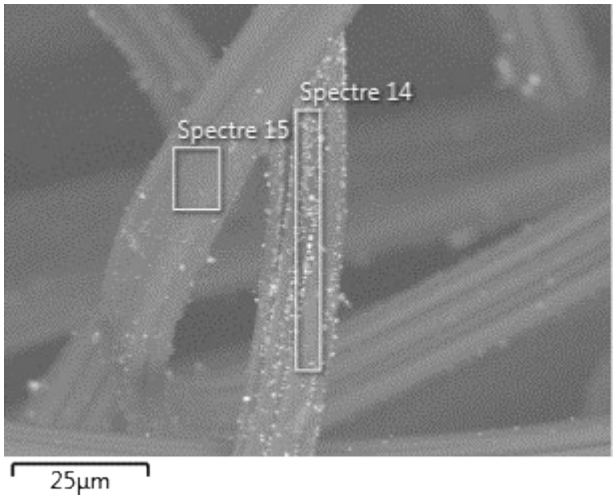

Figure S4. SEM image of CF@Au anode after two months use in Fuel Cell-Fenton system.

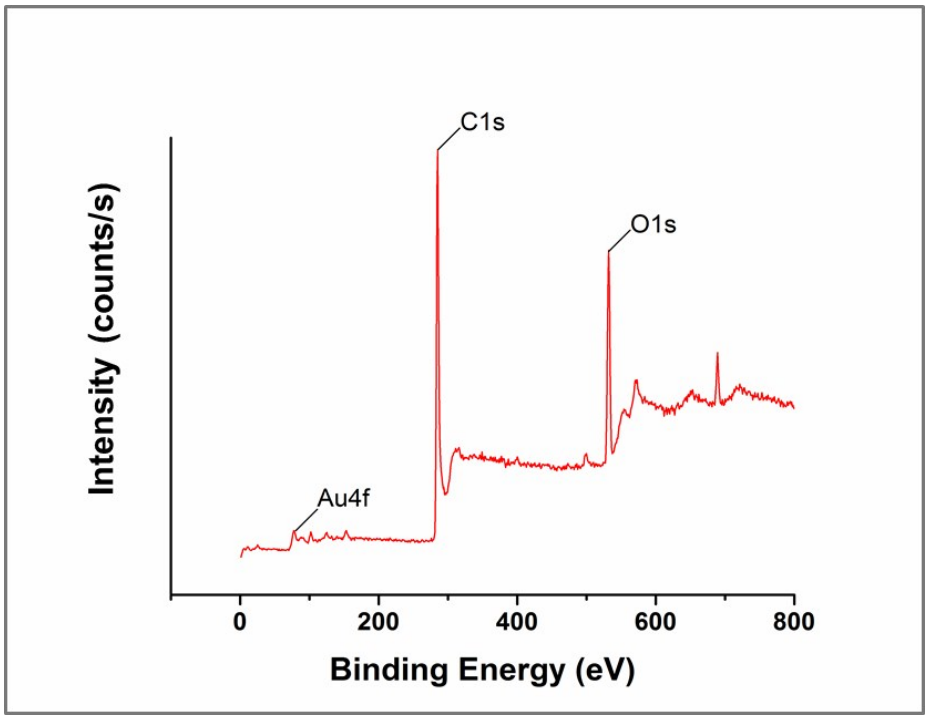

Figure S5. XPS spectrum of CF@Au anode after two months use in Fuel Cell-Fenton system.

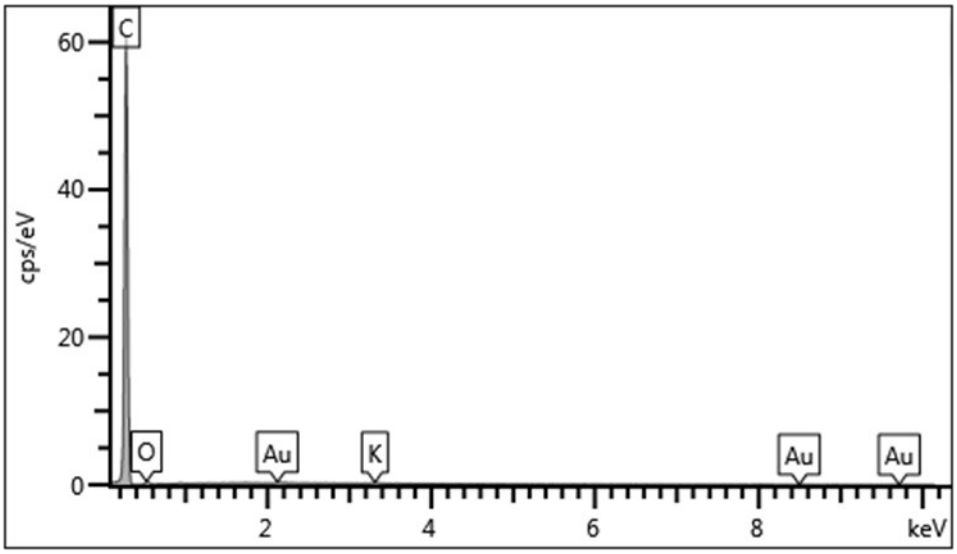

Figure S6. EDX analysis of CF@Au anode after two months use in Fuel Cell-Fenton system.

Table S2 – Elemental composition of CF@Au anode after two months use in Fuel Cell-Fenton system (from EDX analysis).

Element	% Mass	% Atomic
C	97.45	98.53
O	1.75	1.33
K	0.36	0.11
Au	0.44	0.03
Total:	100.00	100.00

2. Physical characterization of CF@pC cathode

2.1. CF@pC cathode before use in Fuel Cell-Fenton system

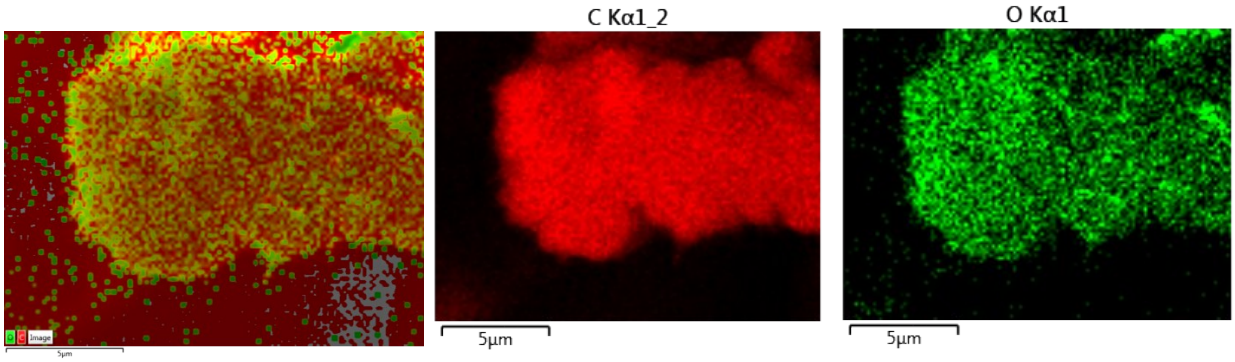

Figure S7. EDX mapping of carbon and oxygen composition on the surface of CF@pC cathode.

Table S3 – Elemental composition of CF@pC cathode (from EDX analysis).

Element	% Mass	% Atomic
C	95.12	96.29
O	4.88	3.71
Total:	100.00	100.00

2.2. CF@pC cathode after two months use in Fuel Cell-Fenton system

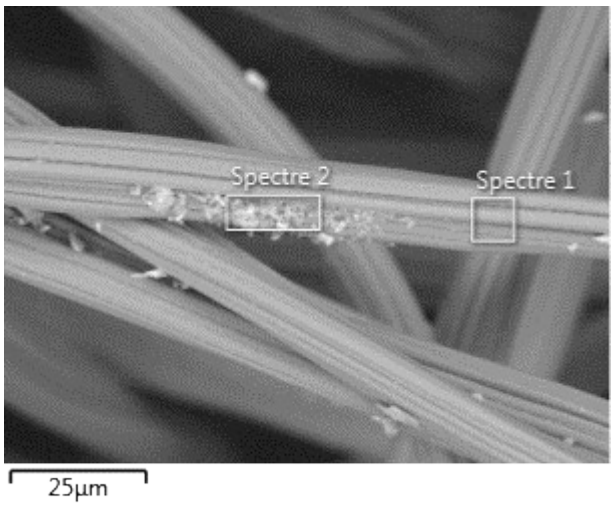

Figure S8. SEM image of CF@pC cathode after two months use in Fuel Cell-Fenton system.

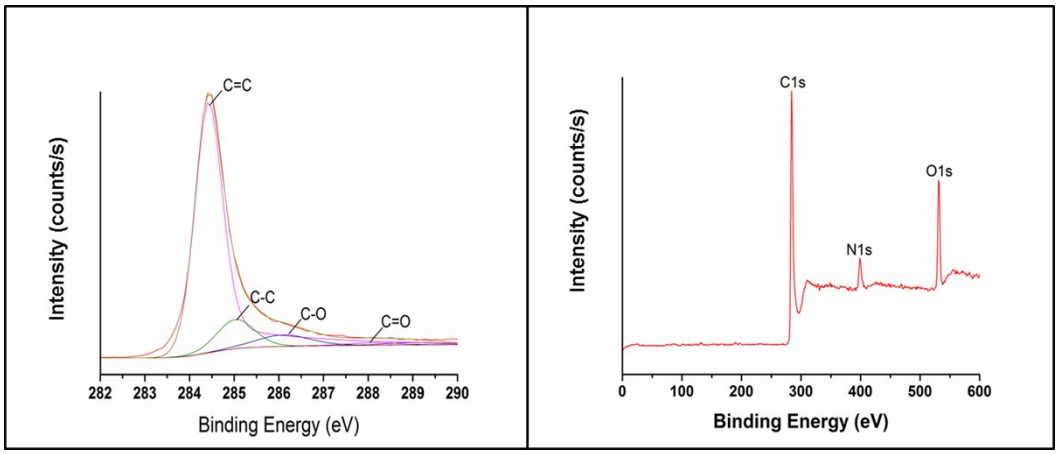

Figure S9. XPS spectra of CF@pC cathode after two months use in Fuel Cell-Fenton system.

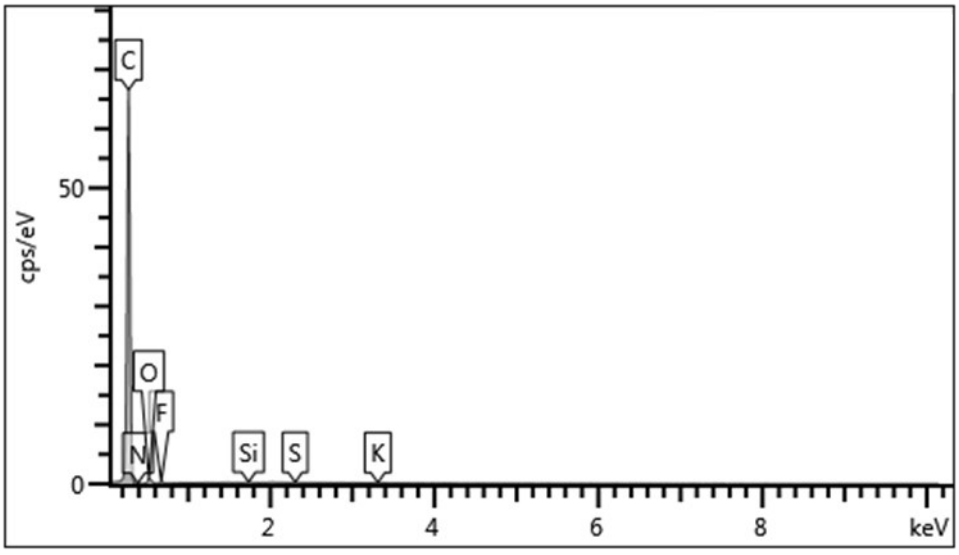

Figure S10. EDX analysis of CF@pC cathode after two months use in Fuel Cell-Fenton system.

Table S4 – Elemental composition of CF@pC cathode after two months use in Fuel Cell-Fenton. System (from EDX analysis).

Element	% Mass	% Atomic
C	94.30	95.80
O	3.05	2.32
N	1.25	1.09
F	0.99	0.63
Si	0.13	0.05
S	0.13	0.05
K	0.16	0.05
Total:	100.00	100.00