Electronic Supplementary Material (ESI) for Nanoscale Advances.

Meso-tetra (4-sulfonatophenyl) porphyrin silver / Ag nanoparticles / graphene phase C_3N_4 with a sandwich-like structure and double-faced active centers via two-step photocatalytic room-temperature synthesis for ractopamine detection

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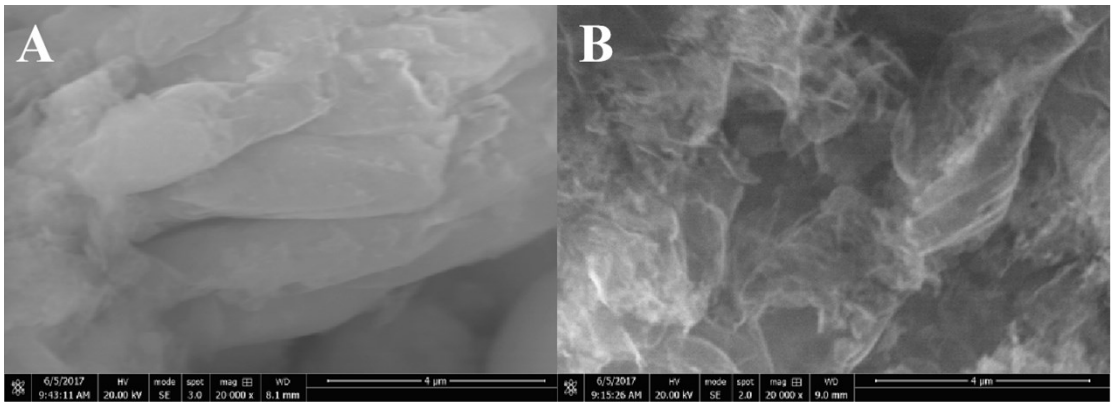


Fig. S1 SEM images of (A) bulk g-C_3N_4 and (B) ng-C_3N_4.

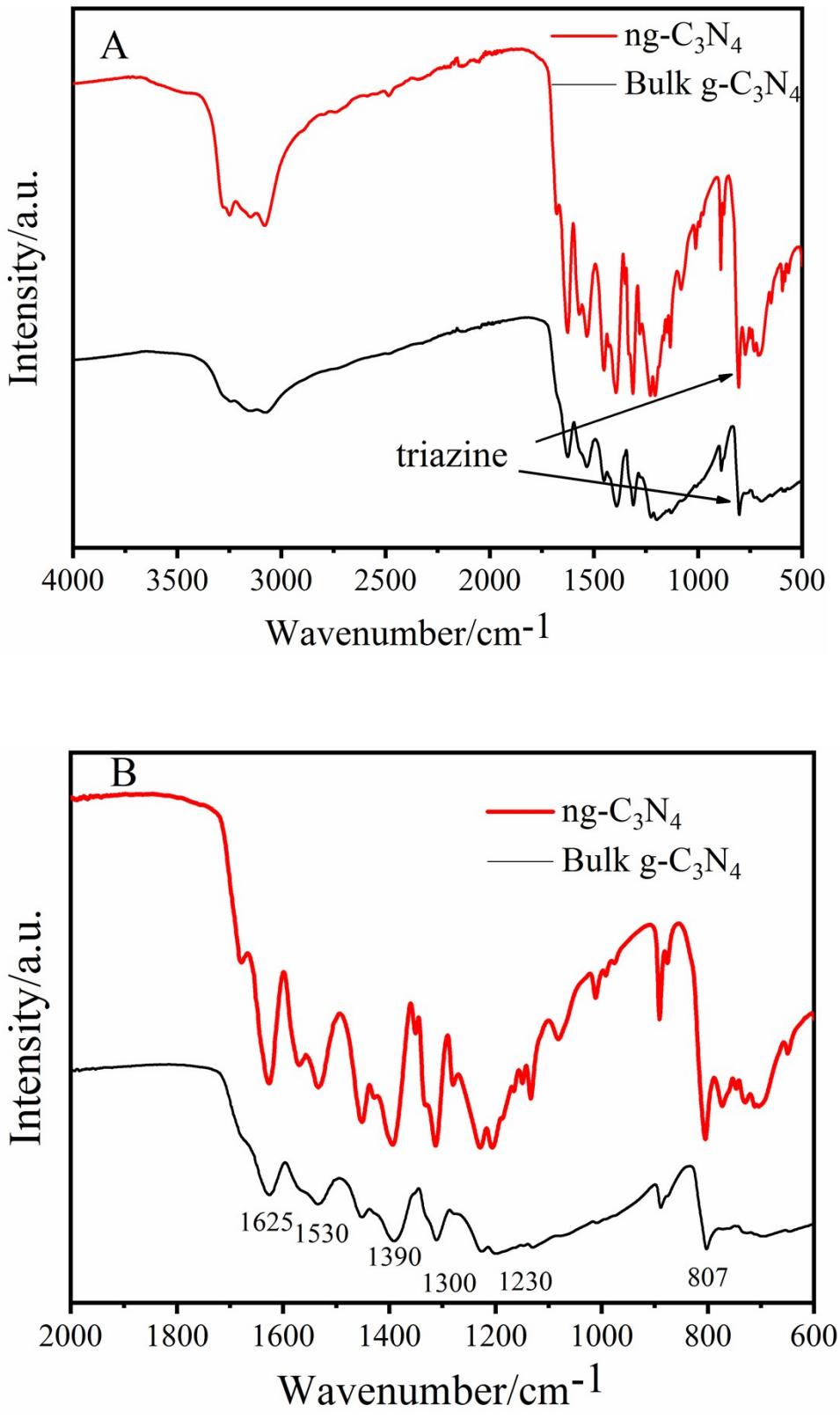


Fig. S2 FT-IR spectra of bulk g-C_3N_4 and ng-C_3N_4 (A: 4000-500cm^{-1} and B: 2000-600cm^{-1}).

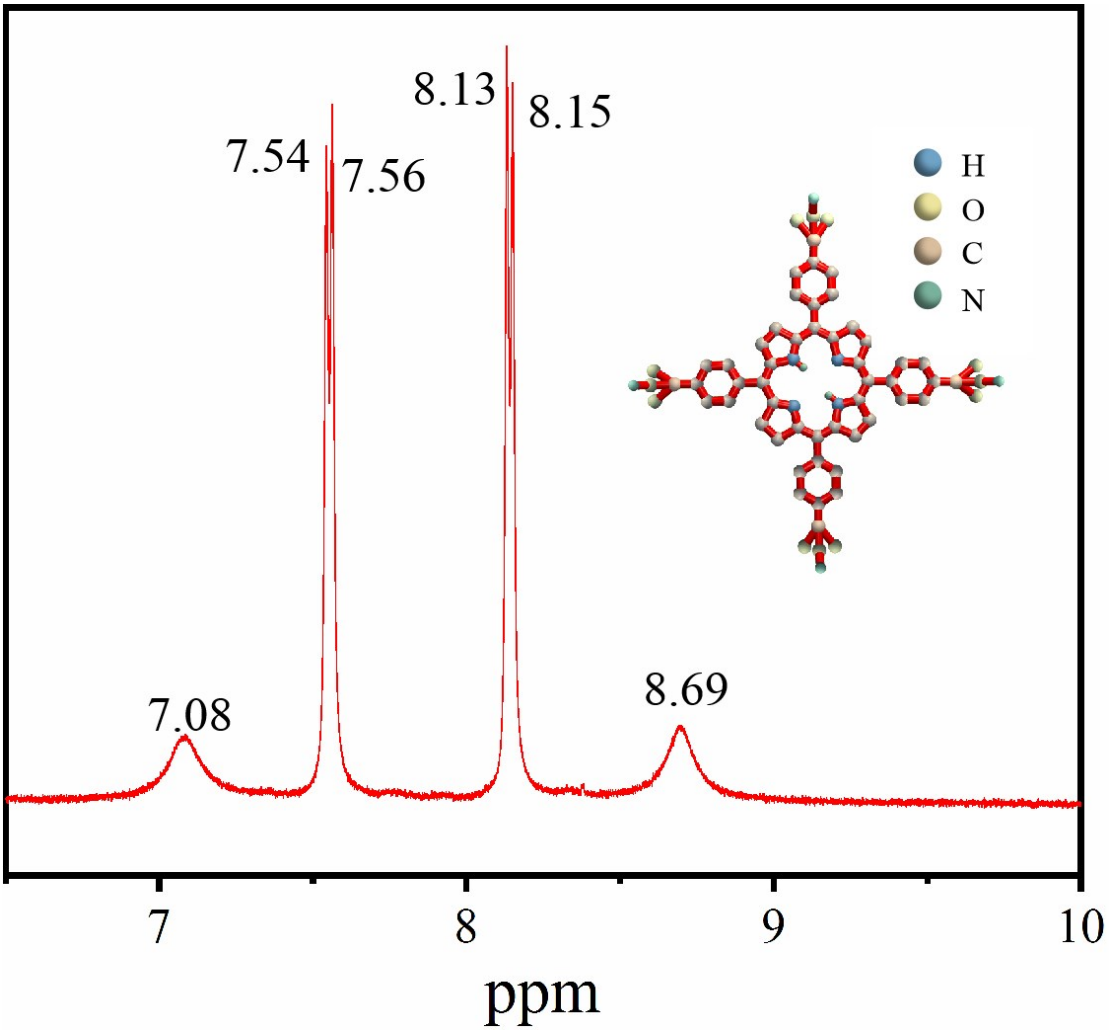


Fig. S3 ^{1}HNMR spectrum of H_2TPPS_4 in D_2O, insert: molecular diagram of H_2TPPS_4.

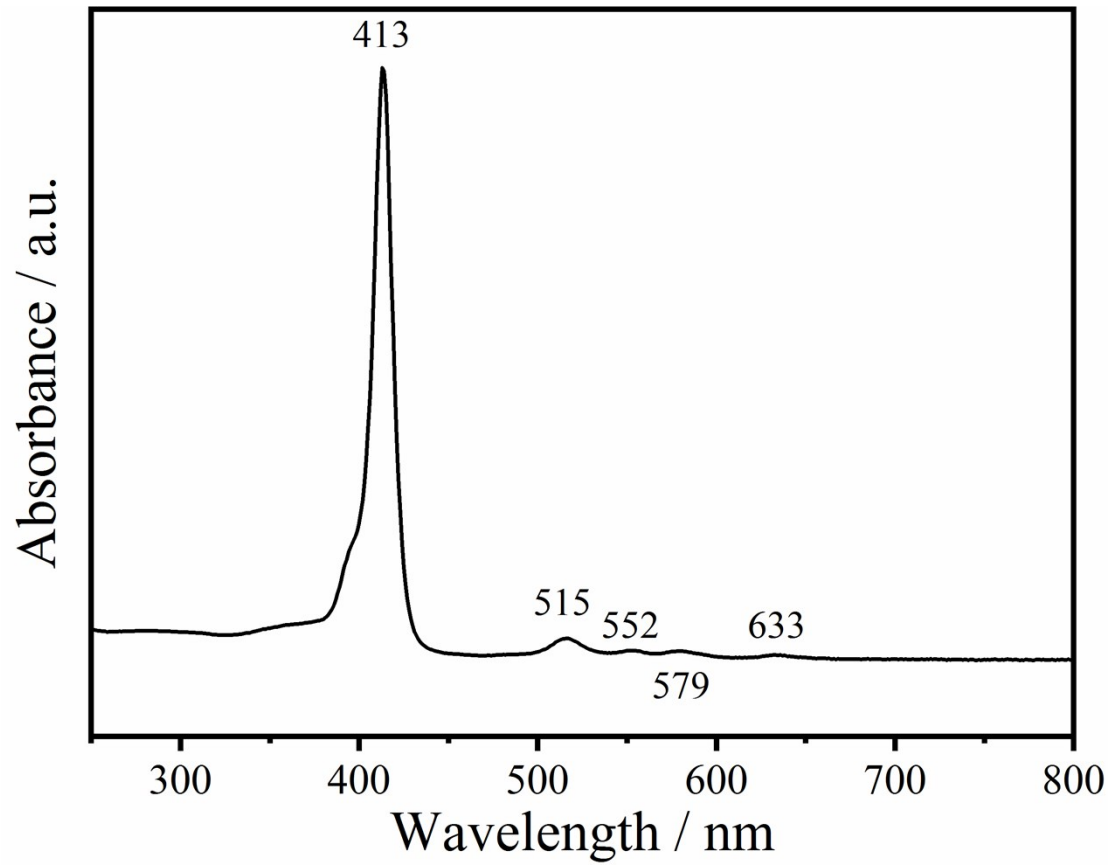
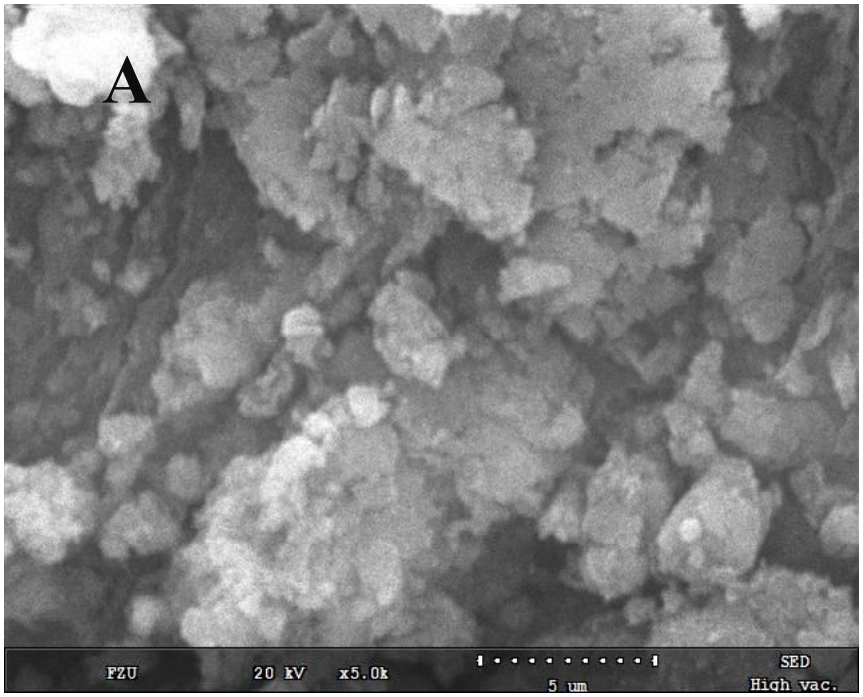


Fig. S4 UV-vis spectrum of H_2TPPS_4 in H_2O.



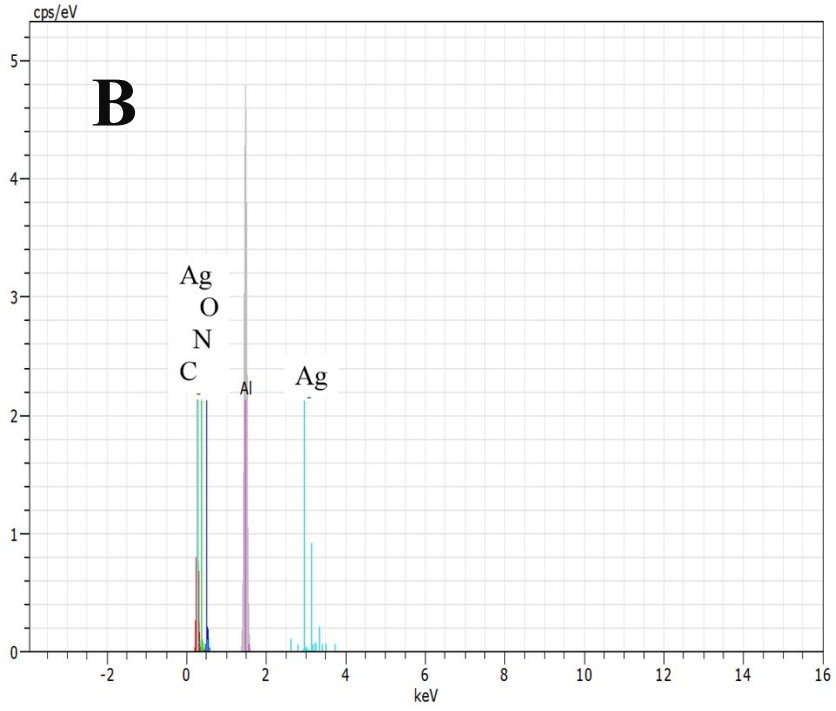


Fig. S5 (A) SEM images and (B) EDS of Ag/ng-C_3N_4.

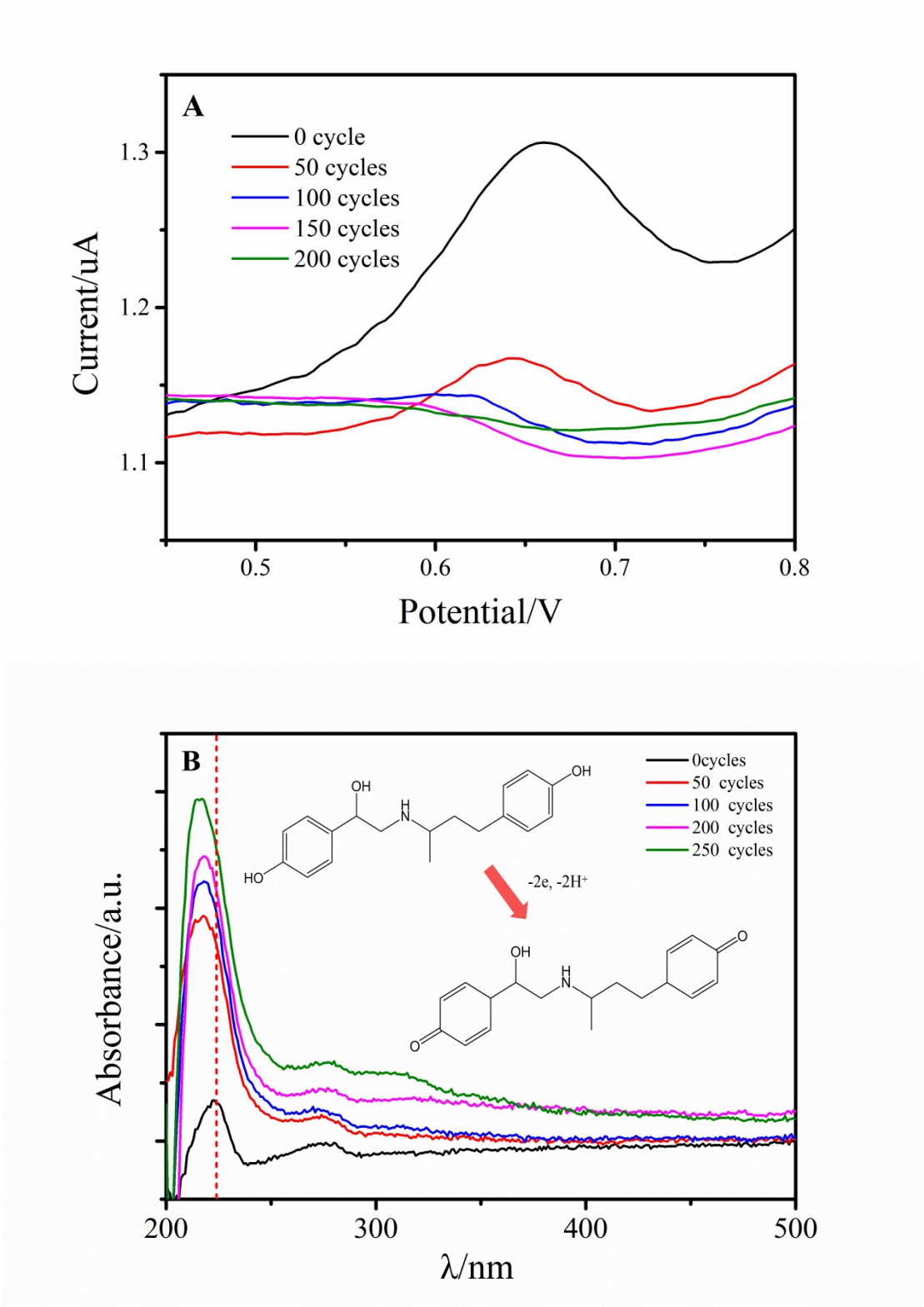


Fig. S6 (A) DPV curves of Ag_2TPPS_4/AgNPs/ng-C_3N_4/GCE in pH 7.0 PBS with 1×10^{-6} M RAC.

(B) UV-vis spectra for RAC after oxidized cycles in pH 7.0 PBS.

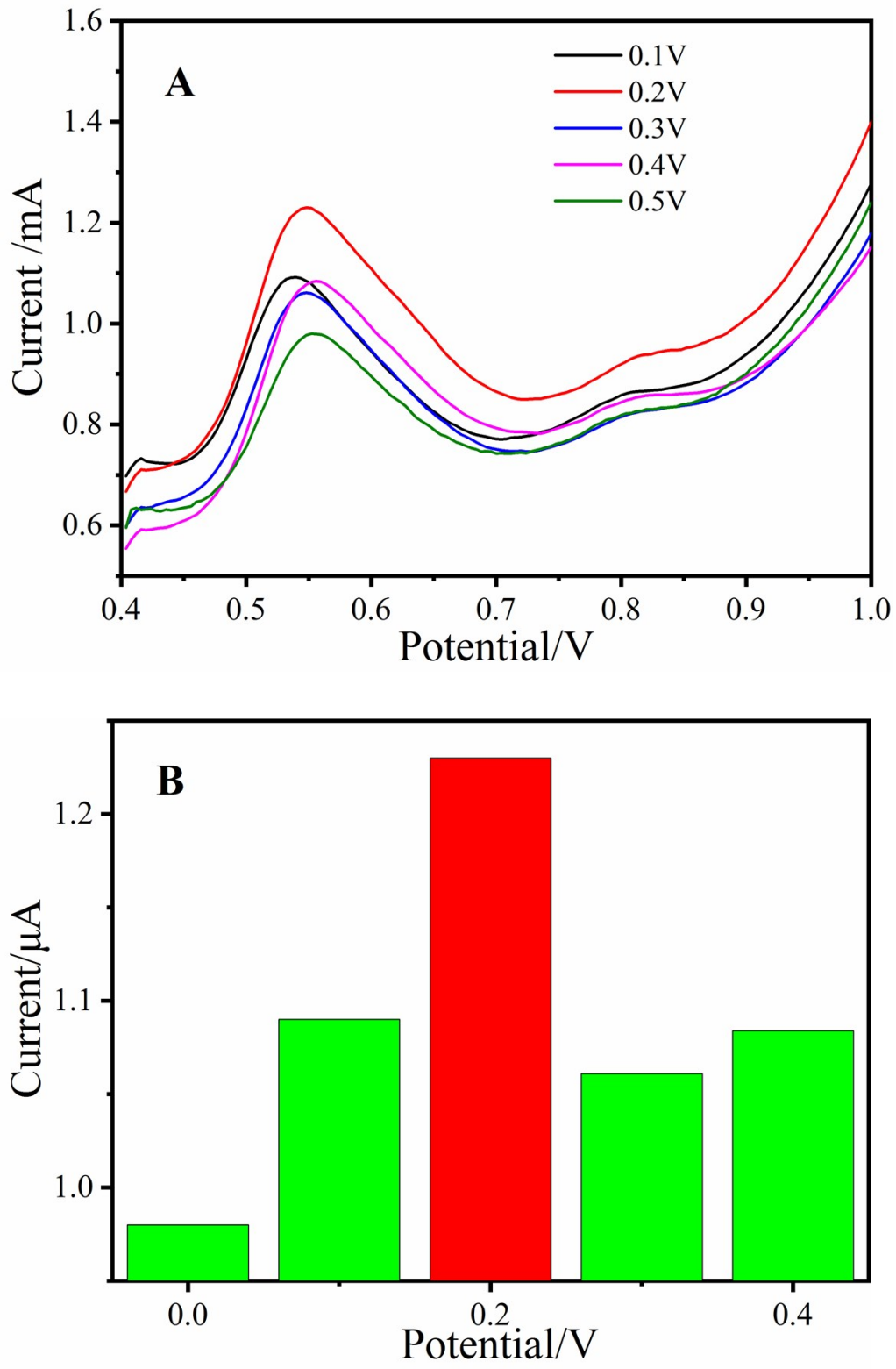
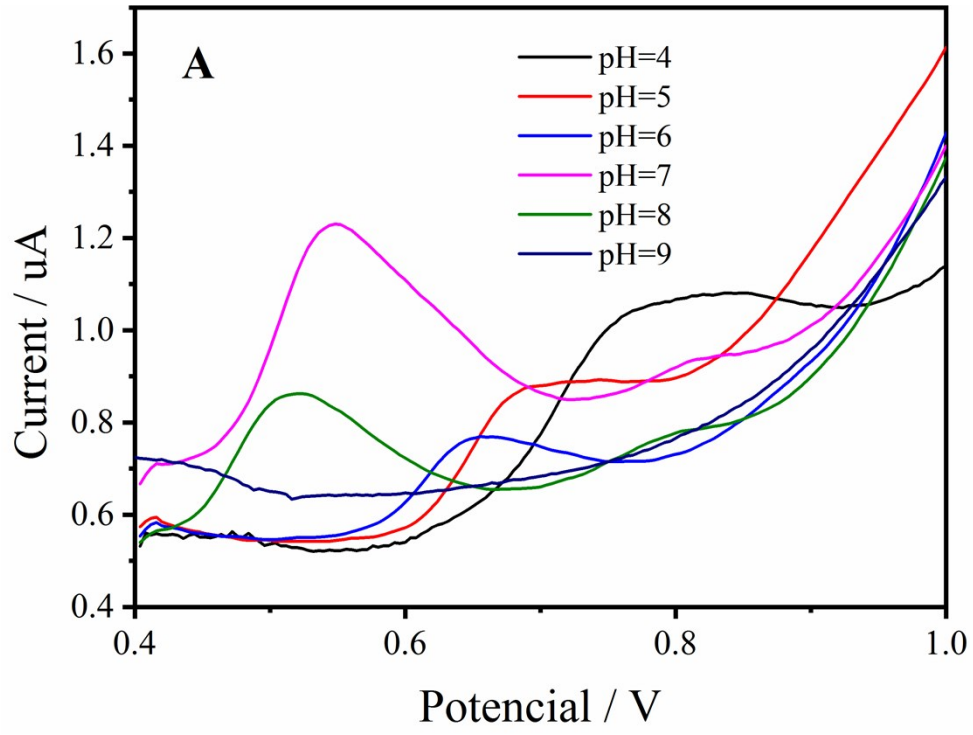


Fig. S7 (A) DPV curves and (B) peak currents of 1×10^{-6} M RAC in PBS with accumulation potentials in the range of 0 to 0.4 V.



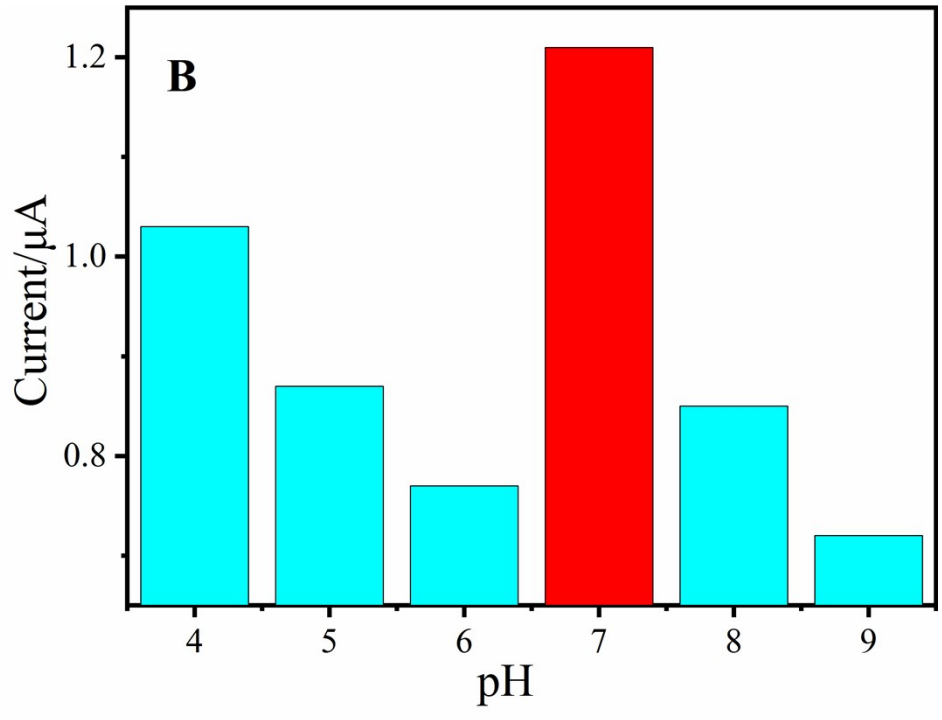


Fig. S8 Effect of solution pH on (A) DPV and (B) electrochemical response of RAC (1×10^{-6} M) on Ag_2TPPS_4/AgNPs/ng-C_3N_4/GCE.

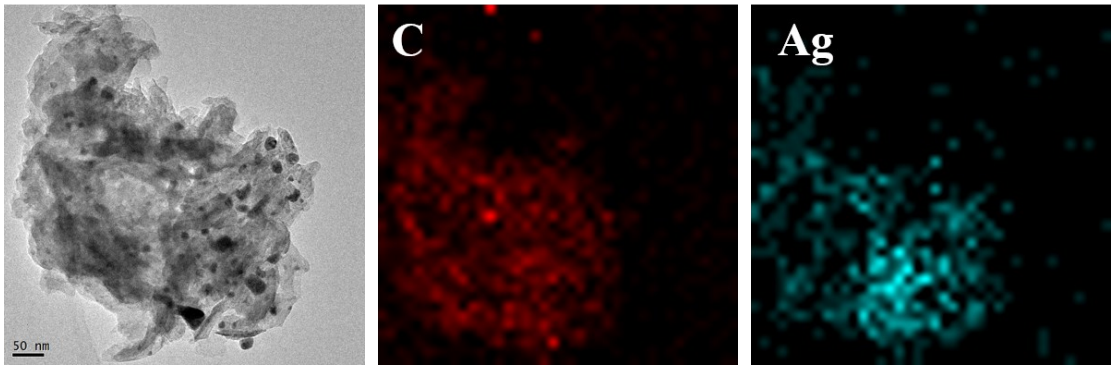


Fig. S9 Elemental mapping of Ag_2TPPS_4/AgNPs/ng-C_3N_4/GCE.

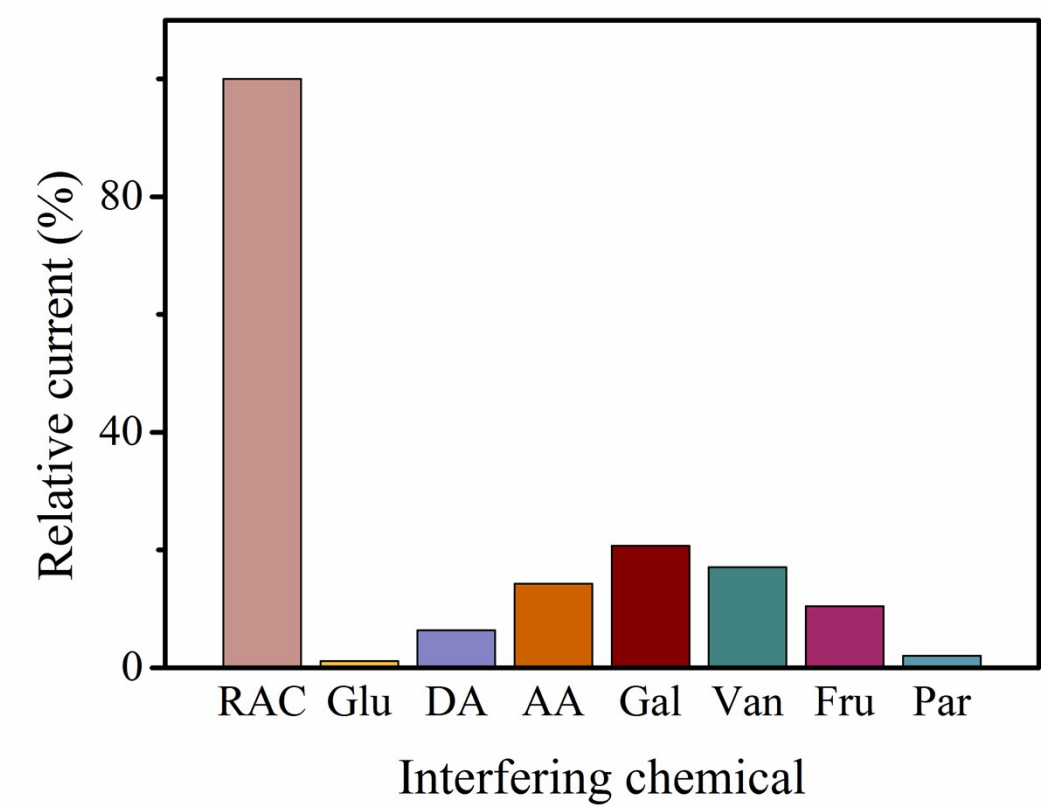


Fig. S10 Current response of Ag_2TPPS_4/AgNPs/ng-C_3N_4/GCE in 50 μM RAC with 500 μM interferences.

Table S1 Zeta potentials of Ag_2TPPS_4/AgNPs/ng-C_3N_4, AgNPs/ng-C_3N_4, RAC, AgNPs/ng-C_3N_4+RAC and Ag_2TPPS_4/AgNPs/ng-C_3N_4+RAC in H_2O.

Samples	Zeta potential (mV)
AgNPs/ng-C_3N_4	-2.13
Ag_2TPPS_4/AgNPs/ng-C_3N_4	-42.2
RAC	1.26
AgNPs/ng-C_3N_4+RAC	7.69
Ag_2TPPS_4/AgNPs/ng-C_3N_4+RAC	-15.6

Table S2 Comparison of analytical parameters for RAC oxidation at Ag_2TPPS_4/AgNPs/ng-C_3N_4 electrode with reported works.

Methods	Linear range (mol/L)	Limit of detection (mol/L)	Ref.
Bi_2Te_3@g-C_3N_4 BNs	$1.5 \times 10^{-8} - 4.56 \times 10^{-4}$	1.77×10^{-9}	[1]
Fe_3O_4-RGO	1.0×10^{-5} - 1.0×10^{-4}	1.3×10^{-8}	[2]
NPVMo/ZrO_2	3.0×10^{-6} - 5×10^{-5}	9.3×10^{-7}	[3]
quartz crystal microbalance	2.5×10^{-6} - 1.5×10^{-4}	1.17×10^{-6}	[4]
OMC	8.5×10^{-8} - 8×10^{-6}	6×10^{-8}	[5]
Ag_2TPPS_4/AgNPs/ng-C_3N_4	1×10^{-7} - 1.2×10^{-5}	5.1×10^{-8}	This work

Table S3 Amount and recovery rate of RAC in milk samples.

Samples	Added (nM)	Found (nM)	Recover (%)
1	5000	4952	99%
		4762	95%
		4619	92%
2	1000	1043	104%
		1062	106%
		990	99%
3	100	114	114%
		110	110%
		105	105%

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