Electronic Supplementary Material (ESI) for Analytical Methods.

Supporting Results

Ultra-sensitive solid substrate-room temperature phosphorimetry for detection of colchicine based on its catalytic effect on H_2O_2 oxidize acridine yellow

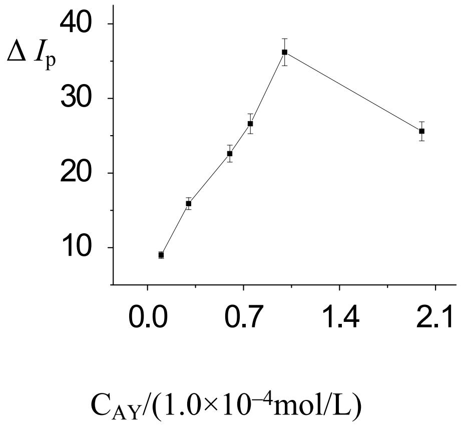
Jiaming Liu, Qitong Huang, Zhen-bo Liu, Xiaofeng Lin, Li-Hong Zhang, Zhi-Yong Zheng, Chang-Qing Lin

(College of Chemistry and Environmental, Minnan Normal University, Zhangzhou, 363000, P.R. China)

Table 1S Main IR, ^{1}HNMR and EIMS data of COL, AY and its complexes

	IR (KBr, cm^{-1})	^{1}HNMR ($CDCl_3$,ppm)	EIMS (M^+, m/z)
COL	2850(–OCH_3), 3300 (N–H), 3180 (–CH_3), 1665, 1640 (C = O)	7.50 (s, 1H; H-8) , 7.42 (d, 1H, 10. 4Hz; H-12) , 6.87 (d, 1H, 10. 4Hz, H-11) , 6.55 (s, 1H, H-4) , 6.03 (s, 2H; NH_2) , 4.70 (m, 1H; H-7) , 3.94 (s, 6H, 2×OCH_3), 3.63 (s, 3H,OCH_3), 1.86, 2.43 (m, 4H, 2×CH_2) , 1.95 (s, 3H, $COCH_3$)	399 (M^+)
CoL'	2850(–OCH_3), 3450 (–NH_2), 1640 (C = O)	7.49(s, 1H; H-8) , 7.41 (d, 1H, 10. 4Hz; H-12) , 6.86 (d, 1H, 10. 4Hz, H-11) , 6.53 (s, 1H, H-4) , 6.58 (s, 2H; NH_2) , 4.68 (m, 1H; H-7) , 3.91 (s, 6H, 2×OCH_3), 3.60 (s, 3H,OCH_3), 1.82, 2.41 (m, 4H, 2×CH_2)	357
N-AY	3300 (N-H), 1588 , 1534 (C = C)	10.13 (2H , s , - N - H), 8.89-7.62 (15H , m , Ar - H) ; 2.58 (6H , s , 3.5 - CH_3)	237 (M^+)
COL'-H…N-AY	2850(–OCH_3), 3450 (–NH_2), 1640 (C = O) ,3295 (N-H), 1584 , 1530 (C = C)	7.45 (s, 1H; H-8) , 7.36 (d, 1H, 10. 4Hz; H-12) , 6.82 (d, 1H, 10. 4Hz, H-11) , 6.49 (s, 1H, H-4) , 6. 55 (s, 2H; NH_2) , 4.63 (m, 1H; H-7) , 3.87 (s, 6H, 2×OCH_3), 3.55 (s, 3H,OCH_3), 1.77, 2.36 (m, 4H, 2×CH_2) 10.09 (2H , s , - N - H), 8.85-6.55 (15H , m , Ar - H) ; 2.52 (6H , s , 3.2 - CH_3),	594 (M^+)

Fig. 1S-11S



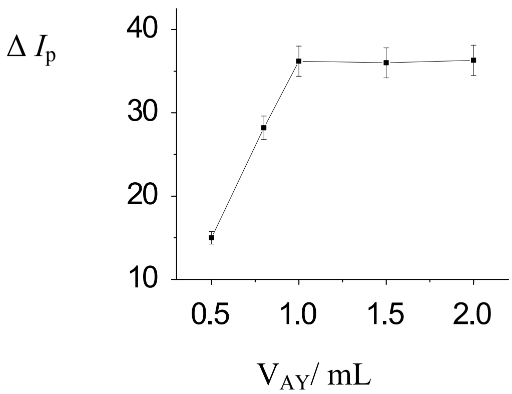
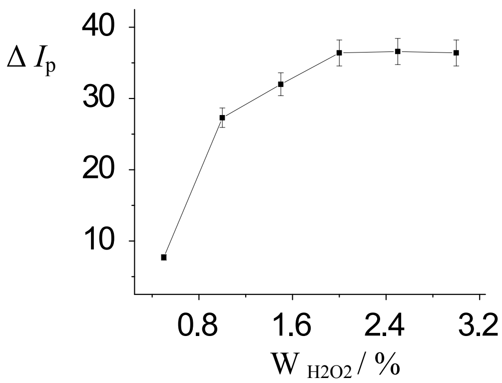


Fig. 1 S Effect of concentration of AY on the ΔI_p of the system (when the concentrations of AY were 0, 0.1, 0.3, 0.75, 1.0, 2.0 ($\times10^{-4}$), corresponding the ΔI_p of the system was 9.0, 15.9, 22.6, 28.6, 36.2, 25.6, respectively.)

Fig. 2 S Effect of dosage of AY on the ΔI_p of the system (when the dosages of AY were 0.00, 0.50, 0.80, 1.00, 1.50, 2.00 (mL), corresponding the ΔI_p of the system was15.0, 28.2, 36.2, 36.0, 36.3, respectively.)



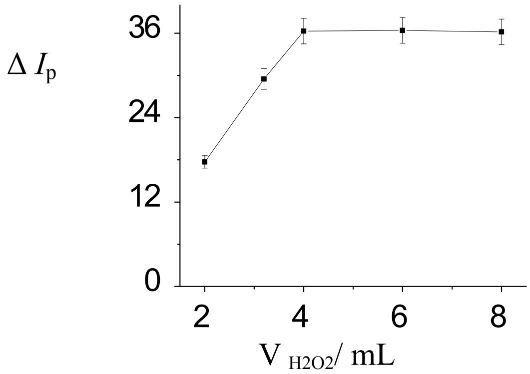


Fig. 3 S Effect of concentration of H_2O_2 on the ΔI_p of the system (when the concentrations of H_2O_2 were 0.5, 1.0, 1.5, 2.0, 2.5, 3.0%, corresponding the ΔI_p of the system was 7.7, 27.3, 32.0, 36.4, 36.6, 36.4, respectively.)

Fig. 4 S Effect of dosage of H_2O_2 on the ΔI_p of the system (when the dosages of H_2O_2 were 2.00, 3.20, 4.00, 6.00 , 8.00 mL, corresponding the ΔI_p of the system was 17.7, 29.5, 36.3, 36.4, 36.2, respectively.)

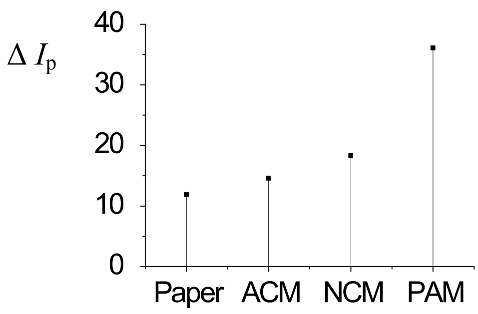


Fig. 5 S Effect of solid substate on the Δ I_p of the system (when the solid substates were paper, PAM, ACM, PAM, corresponding the Δ I_p of the system was 11.9, 14.6, 18.3, 36.1, respectively.)

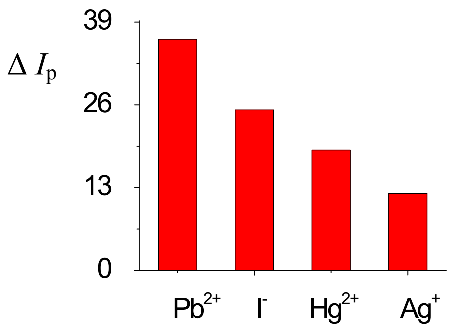


Fig. 6 S Effect of ion perturber on theΔ I_p of the system (when the ion perturbers were Pb^{2+},, I^-, Hg^{2+} , Ag^+, corresponding the Δ I_p of the system was 36.3, 25.2, 18.9, 12.1, respectively.)

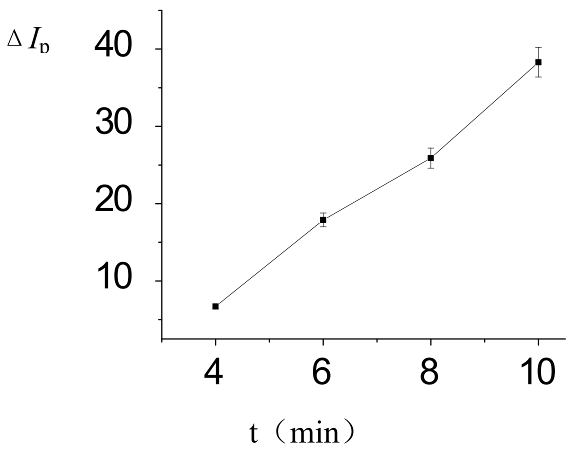


Fig. 7 S Effect of reaction time on the Δ I_p of the system (when the reaction time was 4, 6, 8, 10 min, corresponding the Δ I_p of the system was 8.7, 17.9, 25.9, 36.3, respectively.)

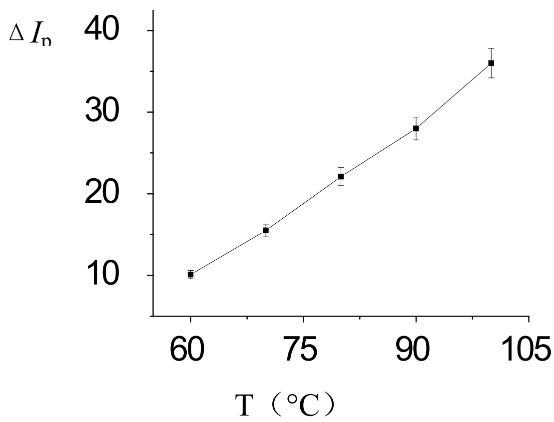


Fig. 8 S Effect of reaction temperature on the Δ I_p of the system (when the reaction temperature was 60, 70, 80, 90, 100 °C, corresponding the Δ I_p of the system was 10.1, 15.5, 22.1, 28.0, 36.0, respectively.)

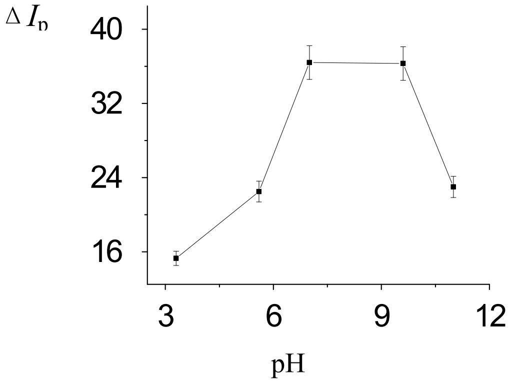


Fig. 9 S Effect of pH values on the Δ I_p of the system (when the pH values were 3.30, 5.60, 7.00, 9.60, 11.0, corresponding the Δ I_p of the system was 15.3, 22.5, 36.4, 36.3, 23.0, respectively.)

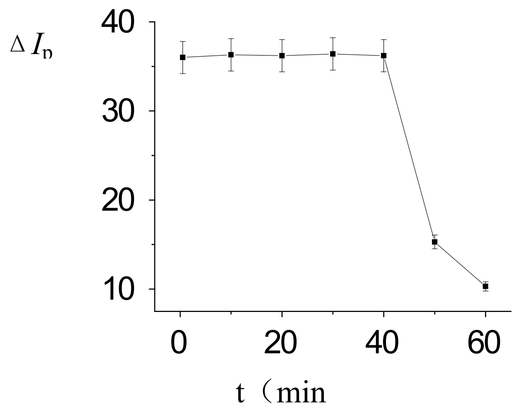


Fig.10 S Effect of time on the stability of the system (when the standing time was 0, 5, 10, 20, 30, 40, 50, 60 min, corresponding the ΔI_p of the system was 36.0, 36.3, 36.2, 36.4, 36.1, 36.2, 15.3, 10.3, respectively.)

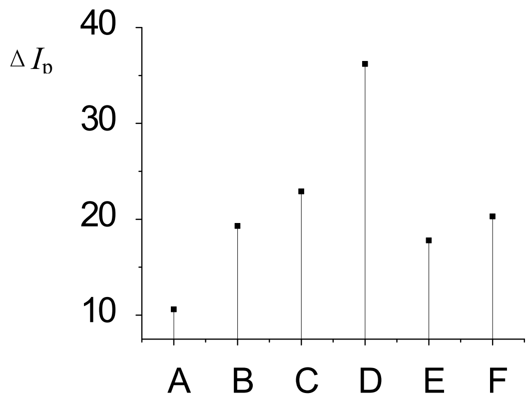


Fig. 11 S Effect of oxidants on the Δ I_p of the system (when the oxidants were $KClO_3$ (A), $K_2S_2O_8$ (B), KIO_4 (C), H_2O_2 (D), $NaIO_4$ (E) and $(NH_4)_2S_2O_8$ (F), corresponding the Δ I_p of the system was 10.6, 19.3, 22.9, 36.2, 17.8, 20.3, respectively.)

Table 2S. Effect of coexistence (ions) materials (for the systems containing 12.0 pg mL^{-1} COL and 12.0 pg mL^{-1} COL + X ng mL^{-1} coexistence (ions) materials, six parallel determination was carried out and the Er was calculated)

	Catalytic SS-RTP			Ref. [8]
Coexistence (ions) materials	Allowed concentration (ng mL^{-1})	Allowed multiple	Er (%)	Allowed multiple
PO_4^{3-}	48.0	4000 (207.6)	3.2	1000
K^+	60.0	5000 (202.7)	0.75	1000
Na^+	42.0	3500 (197.7)	–1.7	1000
$C1^-$	36.0	3000 (194.5)	–3.3	1000
SO_4^{2-}	39.6	3300 (204.8)	1.8	1000
Ca^{2+}	45.6	3800 (202.0)	0.40	1000
NH_4^+	54.0	4500 (201.3)	0.050	1000
Mg^{2+}	38.4	3200 (198.7)	–1.2	1000
Starch	42.0	3500 (196.9)	–2.1	500
Glucose	48.0	4000 (204.5)	1.6	500
Co^{2+}	5.16	430 (203.1)	0.94	100
Sucrose	8.40	700 (201.9)	0.35	100
Fructose	9.60	800 (198.7)	–1.2	100
Al^{3+}	0.600	50 (196.4)	–2.4	10
Zn^{2+}	0.420	35 (210.1)	4.4	10
CO_3^{2-}	0.276	23 (204.8)	1.8	5
Fe^{3+}	0.054	4.5 (200.7)	–0.25	1
Cu^{2+}	0.046	3.8 (199.8)	–0.70	1
Urea	0.120	10 (197.2)	–2.0	1
Uric acid	0.108	9 (196.9)	–2.1	0.1