Electronic Supplementary Material (ESI) for RSC Advances.

Electronic Supplementary Information

Design of ultra-sensitive gold nanorods colorimetric sensor and its application based on formaldehyde reducing Ag^+

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Supporting Results

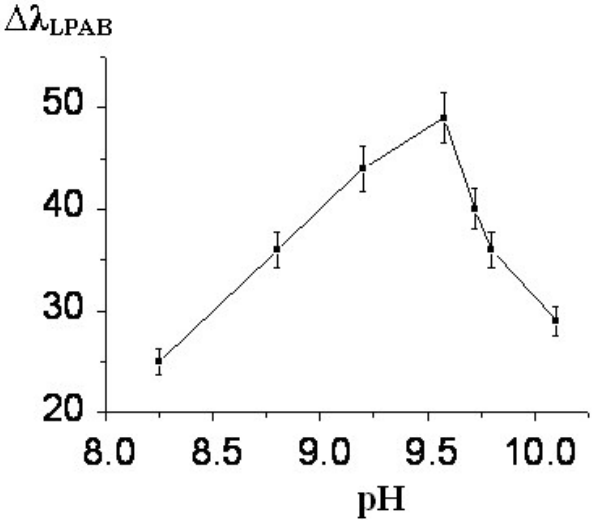

Figure S1 Effect of pH on the $\Delta\lambda_{LPAB}$ of the system containing 1.00 mL AuNRs, 85.0 μL of 0.010 M $AgNO_3$, 1.00 mL glycine-sodium hydroxide buffe and 8.0 ng mL^{-1} HCHO at 50 °C for 15 min.

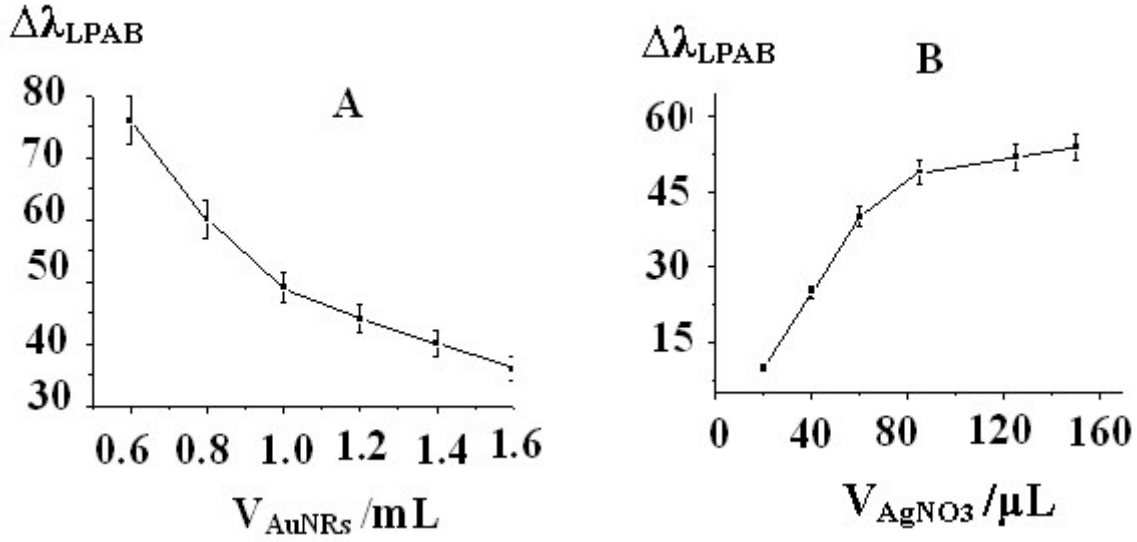

Figure S2. Effects of the dosage of AuNRs (A: 85.0 μL 0.01 M of $AgNO_3$) and $AgNO_3$ (B: 1.00 mL AuNRs) on the $\Delta\lambda_{LPAB}$ of the system containing 1.00 mL AuNRs, 85.0 μL of 0.010 M $AgNO_3$, 1.00 mL glycine-sodium hydroxide buffe and 8.0 ng mL^{-1} HCHO at 50 ℃ for 15 min

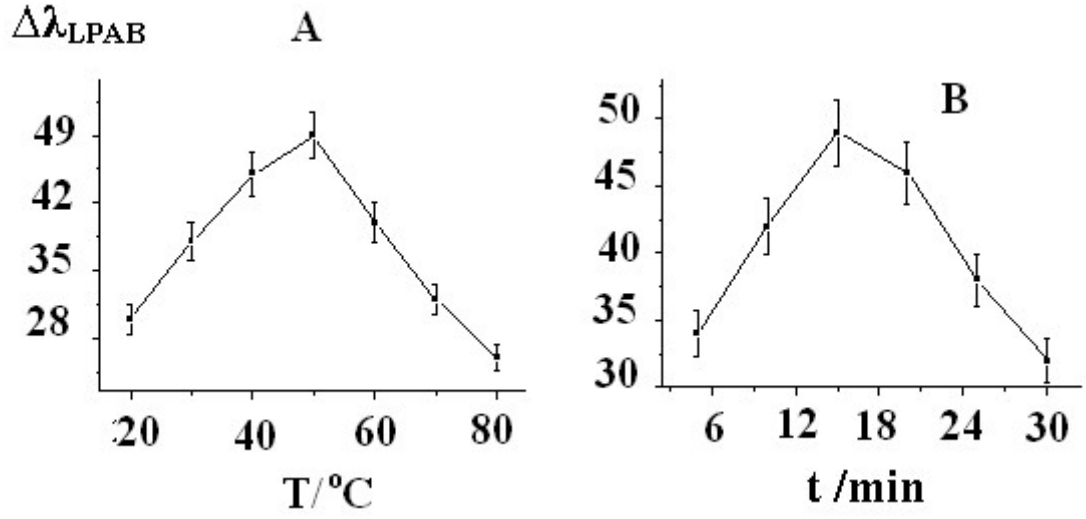

Figure S3 Effects of reaction temperature (A, reaction time: 15 min) and time (B, reaction temperature: 50 ◦C) on the $\Delta\lambda_{LPAB}$ of the system (1.00 mL AuNRs, 85.0 μL of 0.010 M $AgNO_3$, 1.00 mL glycine - sodium hydroxide buffe and 8.0 ng mL^{-1} HCHO. pH = 9.58).

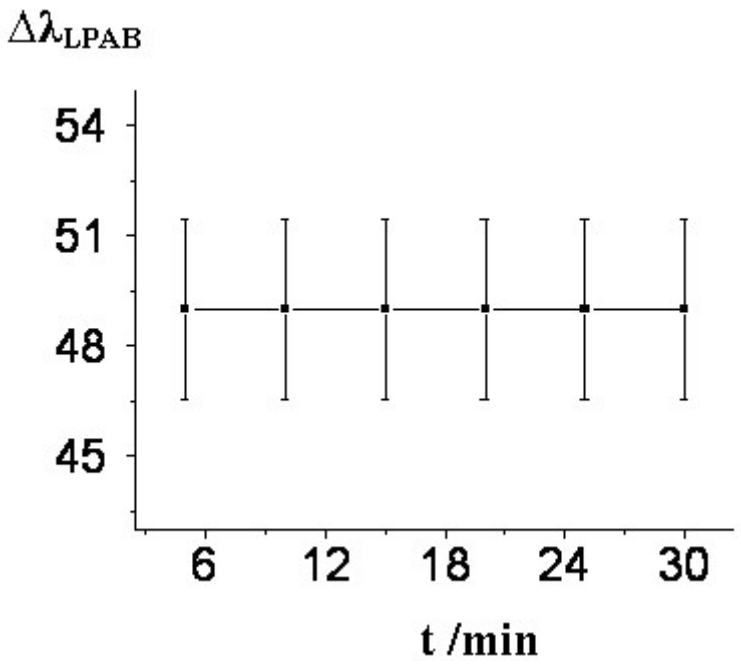

Figure S4. Effects of standing time on the $\Delta\lambda_{LPAB}$ of the system (1.00 mL AuNRs, 85.0 μL of 0.010 M $AgNO_3$, 1.00 mL glycine-sodium hydroxide buffe and 8.0 ng mL^{-1} HCHO at 50 ℃ for 15 min. pH = 9.58)

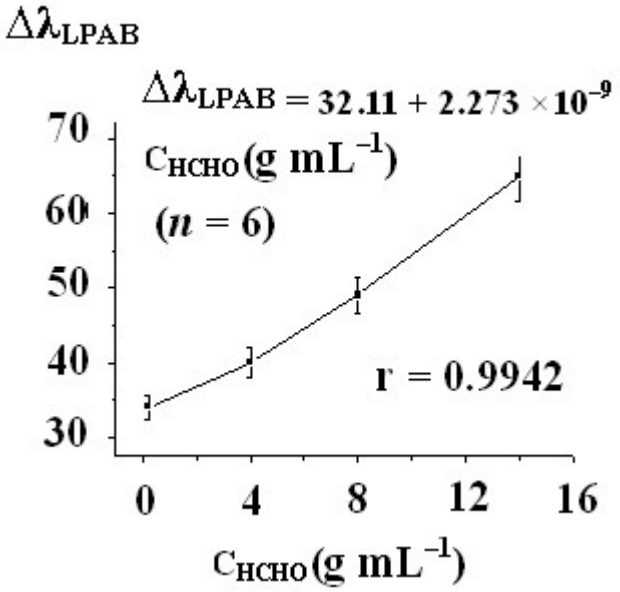

Figure S5 The working curve of this AuNRs colorimetric sensor (When the contents of HCHO were 0, 0.20, 4.00, 8.00 and 14.00 (ng mL $^{-1}$), the $\Delta\lambda_{LPAB}$ (nm) were 34, 40,49 and 65, the corresponding RSD (%, n = 6) were 4.2, 3.8, 3.4 and 3.1, respectively).

Table S1 Effects of the co-existing substances

AuNRs colorimetric sensor			References [1]	AuNRs colorimetric sensor			References [1]
Co-existing substances	Allowed multiples	Er(%)	Allowed multiples	Co-existing substances	Allowed multiples	Er(%)	Allowed multiples
K^+	1200	1.5	1000	NH_4^+	500	2.4	200
Na^+	1200	−3.2	1000	Mn^{2+}	300	1.7	100
SO_4^{2-}	1200	−2.6	1000	Fe^{3+}	100	− 2.8	10
NO_3^-	1000	4.1	500	Cu^{2+}	100	3.3	1
Zn^{2+}	1000	1.9	500	I^-	100	4.2	1
Mg^{2+}	1000	3.7	500	Fe^{3+}	200	2.4	50
F^-	1000	−2.8	500	Co^{2+}	500	3.6	200
Ca^{2+}	800	4.5	400	Citric acid	1500	−4.7	1000
Ni^{2+}	800	−1.8	400	Acetone	600	2.9	100
Pb^{2+}	800	2.1	400	Phenol	600	3.1	100
Cd^{2+}	800	3.0	400	Methanol	600	−2.5	100
Cl^-	800	− 4.0	400	Acetaldehyde	200	3.4	50
Al^{3+}	500	3.9	200	Oxalic acid	200	4.0	50

Reference:[1] G. H. Tan, G. R. Li, J. Zhou, Chin. J. Spectrosc, Lab, 2010, 27, 1436-1439.