Electronic Supplementary Material (ESI) for New Journal of Chemistry.

Supporting Information

Ultrasensitive Point-of-Care Testing of Arsenic Based on Catalytic Reaction of Unmodified Gold Nanoparticles

Chengtao Xu[1], Deye Liu[1,2], Dagan Zhang[1], Chao Zhao[1*] and Hong Liu[1*]

[1.] State Key Laboratory of Bioelectronics, School of Biological Science and Medical Engineering, Southeast University, Nanjing 210096, China.

[2.] Jiangsu Provincial Center for Disease Control and Prevention, Nanjing 210009, China.

*Email: liuh@seu.edu.cn

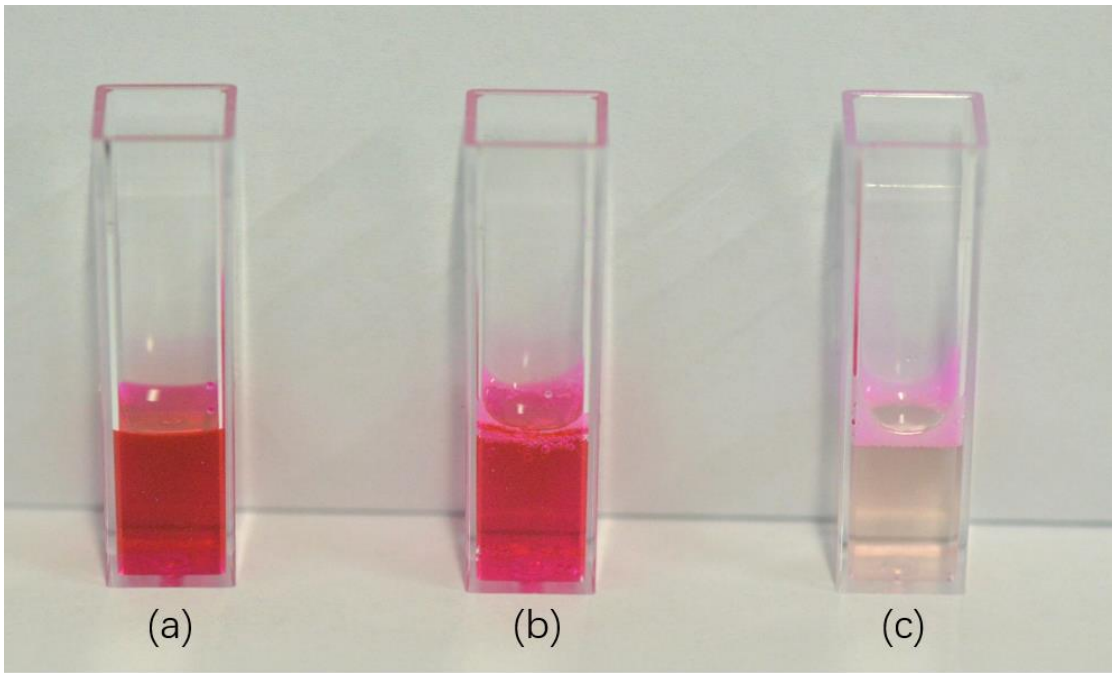

Figure S1. The contrast experiment to identify the catalytic activity of Au NPs. (a) Only Rhodamine B (1.0 mM). (b) Mixture of rhodamine B (1.0 mM) and $NaBH_4$ (10 mM). (c) Mixture of Au NPs (about 50 nM), rhodamine B (1.0 mM) and $NaBH_4$ (10 mM). The photo above was obtained in 5 minutes after mixture.

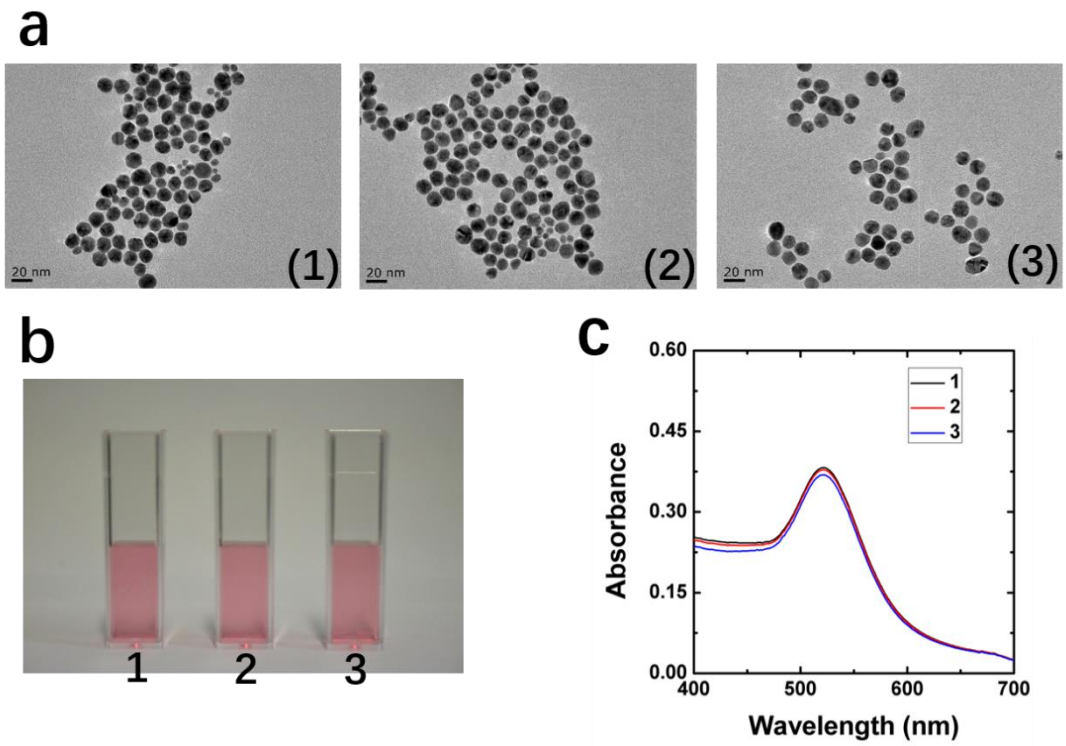

Figure S2. (a) TEM images of Au NPs solutions(1) bare Au NPs,(2) in the presence of AsO_2^-,(3) in the presence of AsO_2^- and $NaBH_4$.(b)Visual observation and (C)UV-vis absorbance spectra of (1)bare Au NPs,(2)Au NPs + AsO_2^-,(3) Au NPs + AsO_2^- +$NaBH_4$.

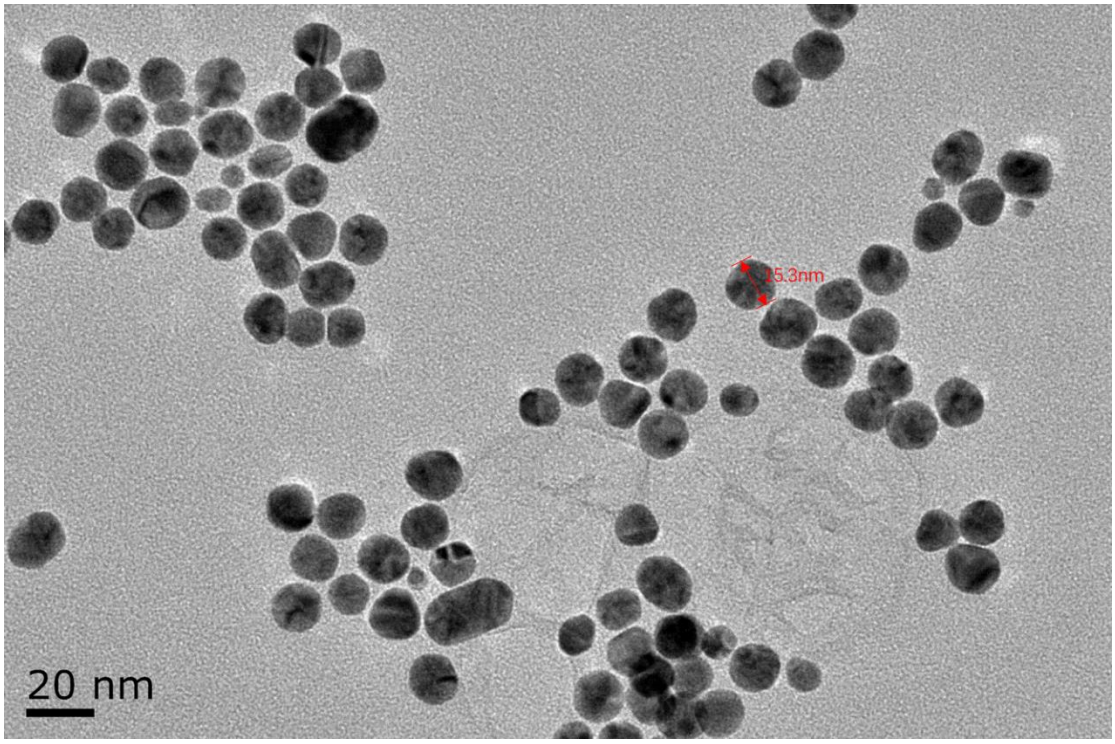

Figure S3. TEM image of bare Au NPs. The diameter of Au NPs is about 15.3 nm

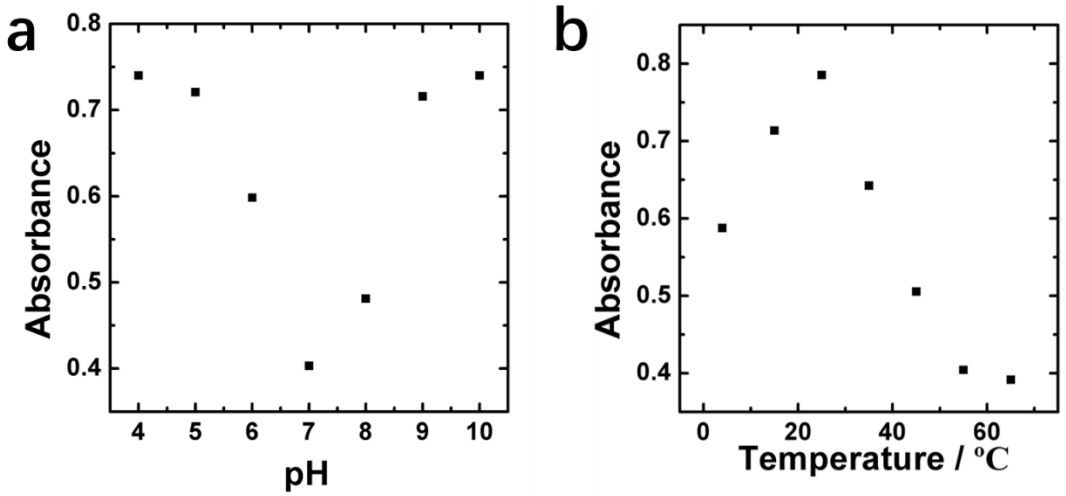

Figure S4. (a) Optimization experiment of pH using RhB-$NaBH_4$ solution with Au NPs (500 µL 3.0 µM Au NPs, 100 µL 1.0 mM RhB and 50 µL 10mM $NaBH_4$).(b)Optimization experiment of temperature using RhB-$NaBH_4$ solution with Au NPs (500 µL 3.0 µM Au NPs, 100 µL 1.0 mM RhB and 50 µL 10mM $NaBH_4$) and AsO_2^- (1.0 ppm, 500 µL).

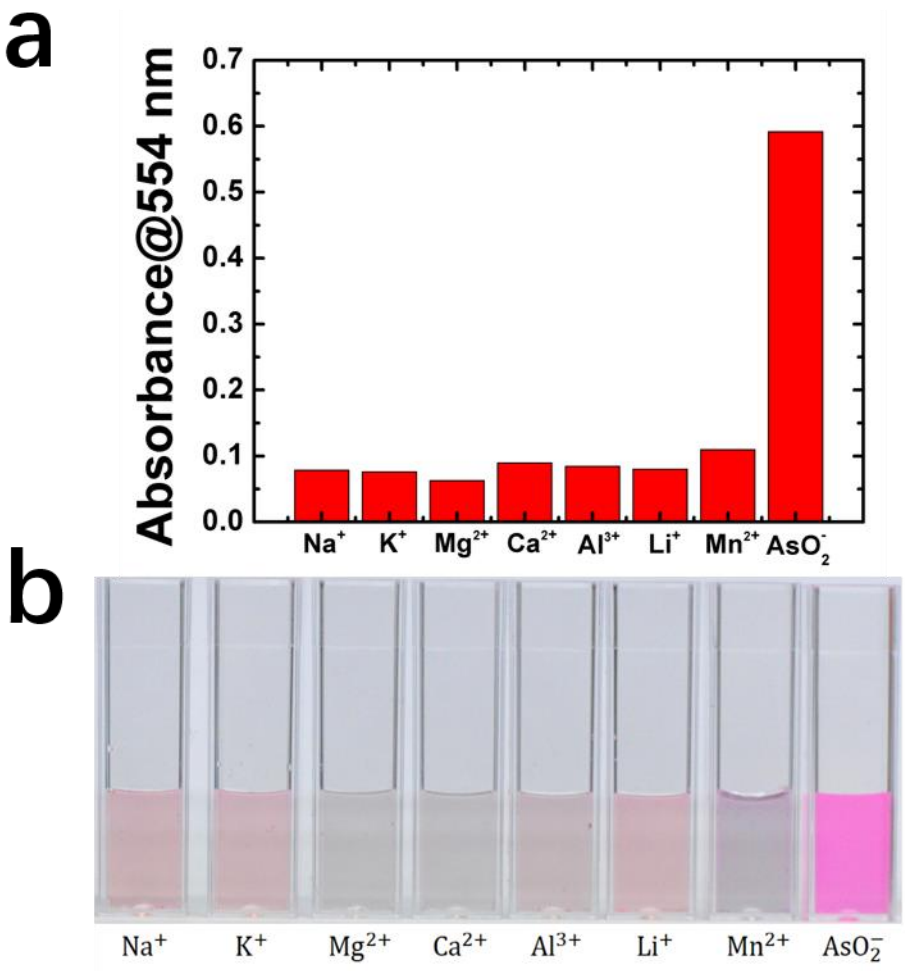

Figure S5.(a)UV-vis absorbance spectra of the RhB solution at a concentration of 50 μM in the presence of Na^+, K^+, Mg^{2+}, Ca^{2+}, Al^{3+}, Li^+, $Mn^{2+}$and AsO_2^- (1.0 ppm for AsO_2^- and 10 ppm for other ions).(b) Photographs of Au NP-catalyzed RhB-NaBH4 solutions in the presence of AsO_2^- and other cations.

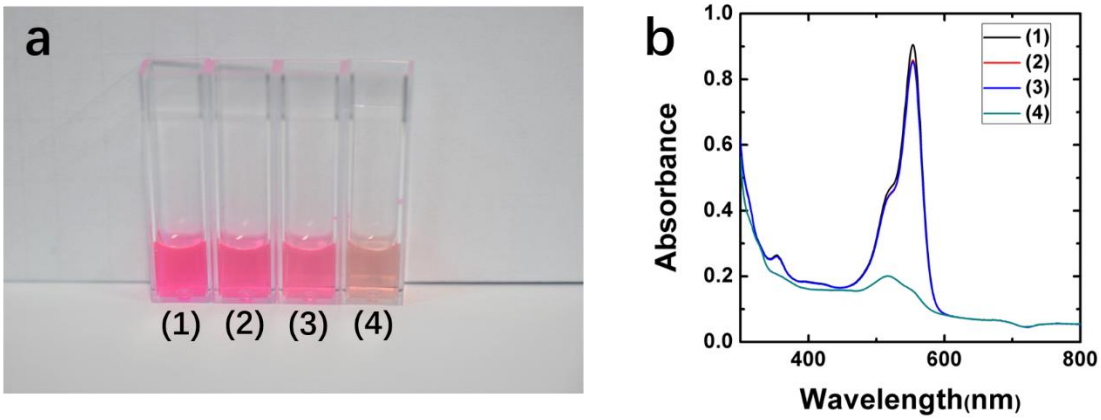

Figure S6. Visual Observation and UV-vis spectra of (1)100 ppb AsO_4^{3-} ,(2)50 ppb AsO_4^{3-} and 50 ppb AsO_2^- ,(3) 100 ppb AsO_2^- and (4)blank control.