Supplementary Information

Silicotungstic acid as highly efficient coreactant of luminol chemiluminescence for sensitive detection of uric acid

Islam M. Mostafa[a,b,c], Mohamed Ibrahim Halawa[a,d], Yequan Chen[a], Abubakar Abdussalam[a,b], Yiran Guan[a,b,*], Guobao Xu[a,b,*]

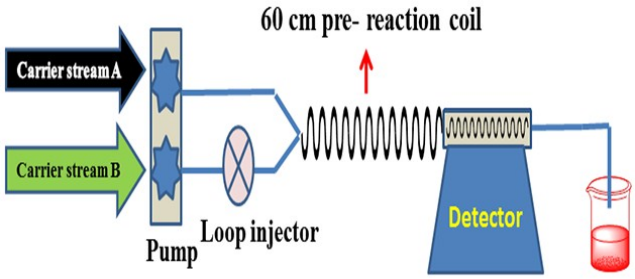
[a] State Key Laboratory of Electroanalytical Chemistry, Changchun Institute of Applied Chemistry, Chinese Academy of Sciences, Changchun, Jilin 130022, PR China

[b] University of Science and Technology of China, Hefei, 230000, PR China

[c] Department of Analytical Chemistry, Faculty of Pharmacy, Minia University, 61519, Minia, Egypt

[d] Department of Pharmaceutical Analytical Chemistry, Faculty of Pharmacy, University of Mansoura, 35516, Mansoura, Egypt

Table of Contents



Scheme S1. Schematic diagram of the used flow injection system. (A) and (B) are the flow channels connected to pump system which is connected to loop injector. On the other side there is a 60 cm pre-reaction coil before CL cell and (F) is the waste cup.

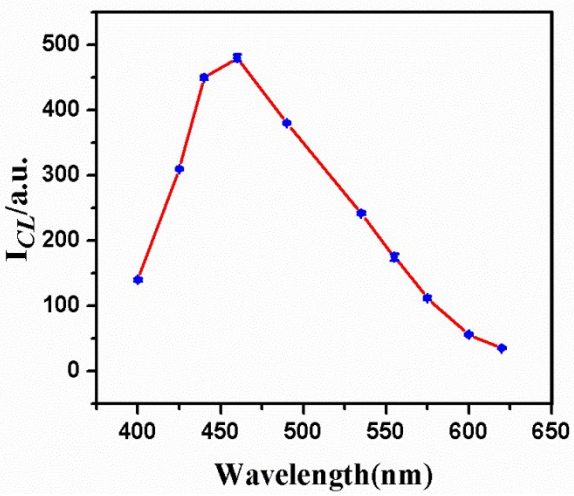


Fig. S1. CL spectrum of luminol-STA system. [Luminol]: 10 μM; [STA]: 1 mM; [pH]: 12.0; PMT voltage: 950 V.

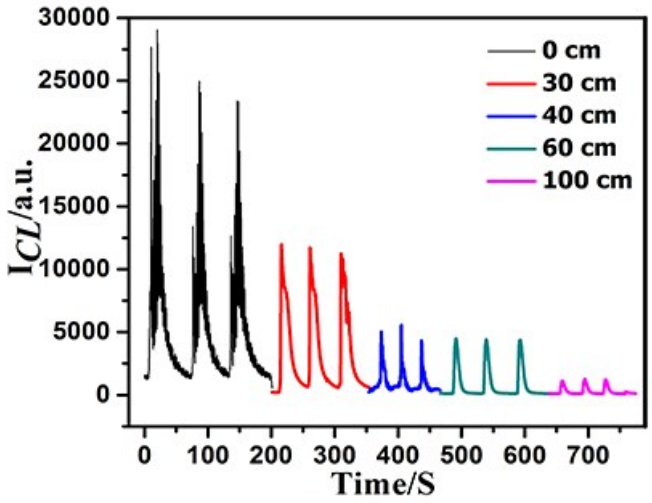


Fig. S2. Effect of the length of the pre-reaction coil on luminol-STA system. The CL kinetic profiles were recorded in the presence of 10 μM luminol and 2 mM STA at pH 12.0; PMT voltage: 800 V.

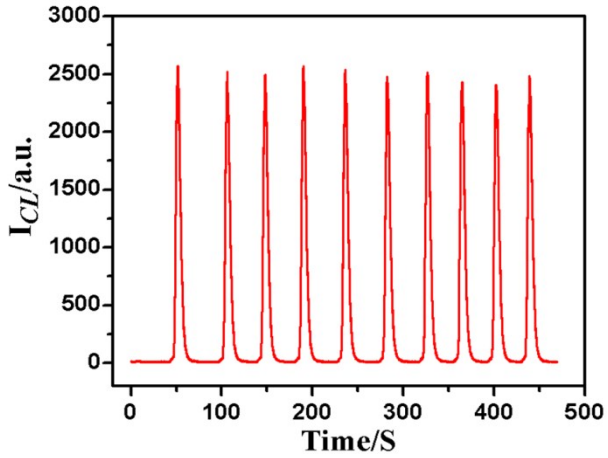


Fig. S3. Reproducibility for measurement of 40 μM luminol, 1 mM STA at pH 12.0; PMT voltage: 1000 V.

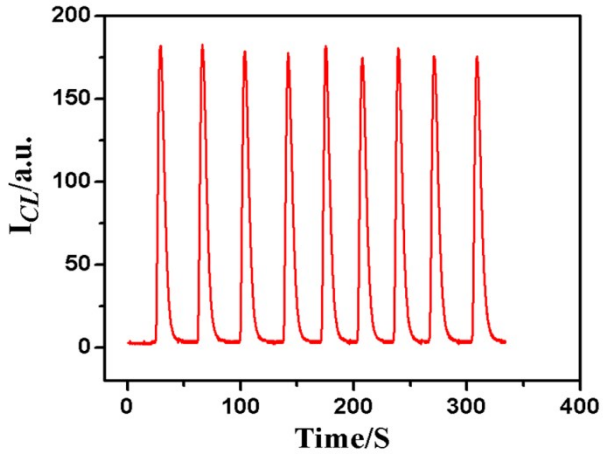


Fig. S4. Reproducibility for measurement of 1 μM STA and 10 μM luminol at pH 12.0; PMT voltage: 800 V.

Table S1. Comparison of different methods for the detection of UA

Analytical Method	Linear	LOD	Ref.
CE-luminol-$K_3[Fe(CN)_6]$	0.6–30 μM	0.4 μM	1
Uricase/AuNP/MWCNT	10-800 μM	10 μM	2
$KMnO_4$-OP	0.6–3600 μM	0.3 μM	3
CL biosensor	6–600 μM	0.6 μM	4
Uricase/HRP-CdS quantum dots	125-1000 μM	125 μM	5
Luminol-$K_3[Fe(CN)_6]$	4.8–179 μM	3 μM	6
HoFNPs/MWCNTs/GCE	0.2-500.0 μM	0.16 μM	7
Luminol-DPA	0.4–200 μM	0.12 μM	8
Uricase/MIL-53(Fe)	4.5-60 μM	1.3 μM	9
CdTe nanoparticles/H_2O_2	0.2-6.0 μM	0.10 μM	10
Luminol-STA	1-5000 nM	0.75 nM	Our method

Table S2. Analytical results for the detection of UA in real urine sample

Sample	Concentrations of UA				RSD (n=3;%)
	Amount detected[a]	Amount added	Amount found[b]	(%) Recovery	
Urine	1.30μM	0.0μM	-	-	**3.1**
		0.10μM	**1.42μM**	**101.7**	**3.1**
		0.50μM	**1.79μM**	**99.6**	**4.2**
		1.00μM	**2.35μM**	**102.3**	**3.0**

[a,b] average of three determinations.

References

1. S. Zhao, J. Wang, F. Ye and Y.-M. Liu, *Anal. Biochem.*, 2008, **378**, 127-131.
2. N. Chauhan and C. S. Pundir, *Anal Biochem*, 2011, **413**, 97-103.
3. Z. Li, M. Feng and J. Lu, *Microchem J*, 1998, **59**, 278-283.
4. Y. Lv, Z. Zhang and F. Chen, *Analyst*, 2002, **127**, 1176-1179.
5. N. E. Azmi, N. I. Ramli, J. Abdullah, M. A. Abdul Hamid, H. Sidek, S. Abd Rahman, N. Ariffin and N. A. Yusof, *Biosens. Bioelectron.*, 2015, **67**, 129-133.
6. D. He, Z. Zhang, Y. Huang, Y. Hu, H. Zhou and D. Chen, *Luminescence*, 2005, **20**, 271-275.
7. M. Noroozifar, M. Khorasani-Motlagh, F. Z. Jahromi and S. Rostami, *Sens. Actuators B: Chem*, 2013, **188**, 65-72.
8. C. Yang and Z. Zhang, *Talanta*, 2010, **81**, 477-481.
9. J. Lu, Y. Xiong, C. Liao and F. Ye, *Anal. Methods*, 2015, **7**, 9894-9899.
10. D. Jin, M.-H. Seo, B. T. Huy, Q.-T. Pham, M. L. Conte, D. Thangadurai and Y.-I. Lee, *Biosens. Bioelectron.*, 2016, **77**, 359-365.