Electronic Supplementary Material (ESI) for Analyst.

Supporting Information

Electrochemiluminescence of $Ru(bpy)_3^{2+}$/Thioacetamide and its Application for Sensitive Detection of Hepatotoxic Thioacetamide

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Calculation of Limits of Detection (LOD)

LOD was calculated as follows.[1,2] The lowest distinguishable signal S_m is calculated as the sum of the average blank signal X_{bl} plus a multiple k of the standard deviation of the blank (σ_{bl}). That is

$$S_m = X_{bl} + 3\sigma_{bl} \quad \text{.....(1)}$$

The corrected signal, $S_m - X_{bl}$ is proportional to sample concentration.

$$S_m - X_{bl} = m \times sample\ concentration \quad \text{....(2)}$$

where m is the slope from the calibration curve. Substituting X_{bl} from Eq.(1) for S_m in Eq.(2), LOD can be obtained.

$$LOD = \frac{3\sigma}{m} \quad \text{.....(3)}$$

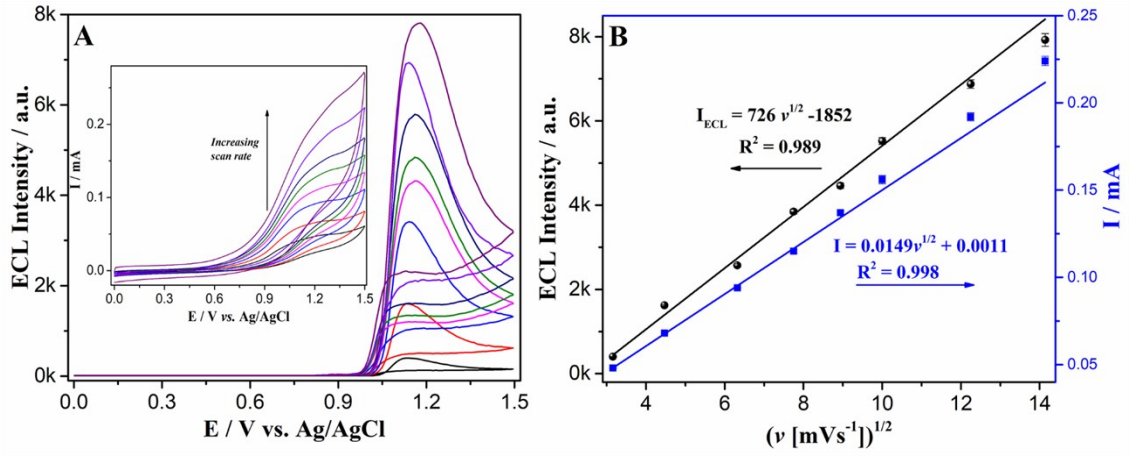

Figure S1: ECL emission intensity and cyclic voltammograms (the inset) of 1 mM $Ru(bpy)_3^{2+}$ and, 0.5 mM TAA at scan rates: 10, 20, 40, 60, 80, 100, 150 and 200 mVs^{-1} (A) and the linear relationship of TAA between the ECL intensity or the anodic current and the square root of the scan rate ($v^{1/2}$) (B) measured at the GCE in 0.1 M PBS pH 7.5.

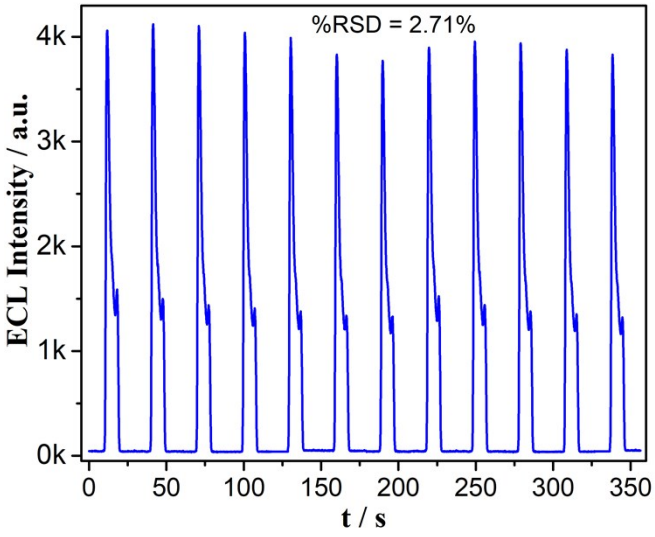

Figure S2. The ECL stability of solution containing 1 mM $Ru(bpy)_3^{2+}$ and 0.5 mM TAA measured at the GCE in 0.1 M PBS pH 7.5.

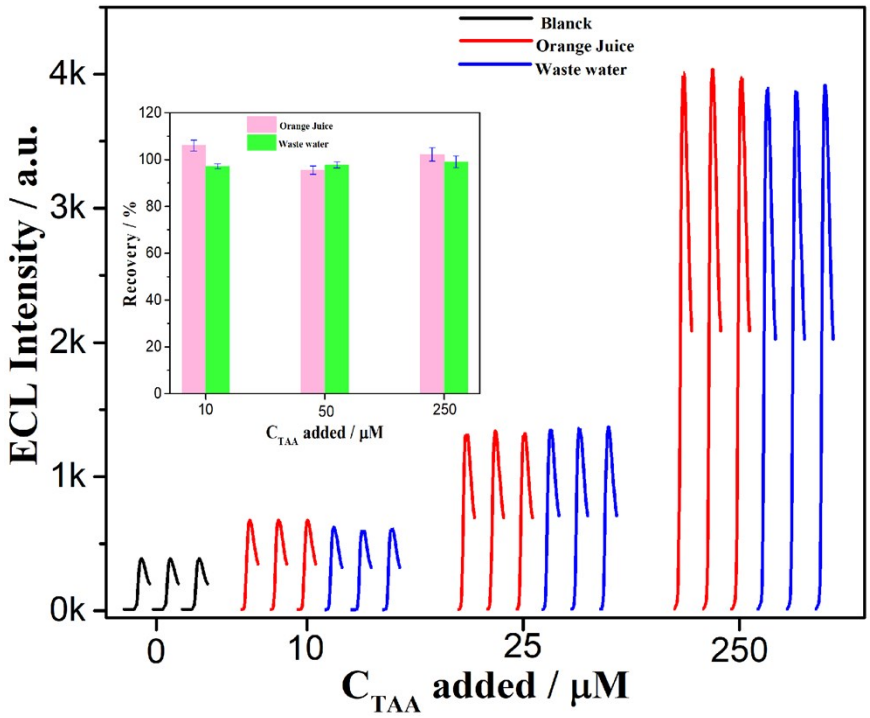

Figure S3. Chronoamperometric ECL emission signals of the $Ru(bpy)_3^{2+}$-TAA ECL system on additions of different concentration of TAA in orange juice and waste water samples. (Inset: A bar graph showing the %recovery on additions of different concentration of TAA).

Table S1: Real sample analysis results of TAA in Orange juice and waste water samples.

Sample	Detected (μM)	Added (μM)	Found (μM)	RSD (%)	Recovery (%)
Orange Juice	0	-	-	3.2	-
		10	10. 6	2.4	106.0
		50	47.75	1.79	95.5
		250	255.59	2.9	102.2
Waste Water	0	-	-	-	-
		10	9.72	1.06	97.2
		50	48.89	1.35	97.78
		250	247.82	2.52	99.13

Table S2: Repeatability and reproducibility study for $Ru(bpy)_3^{2+}$-TAA ECL System.

Precision	**Conc. of TAA (μM)**	**%Recovery (mean)**	**%RSD**
Repeatability (Intra-day)	50	99.04	1.54
	100	97.64	2.87
	500	105.33	2.25
Reproducibility (Inter-day)	50	97.71	2.86
	100	104.62	3.21
	500	97.12	3.52

References

(1) Harris, D. C. *Quantitative Chemical Analysis*, 8th ed.; W. H. Freeman and Company, 2010.

(2) Douglas A. Skoog; F. James Holler; Crouch, S. R. *Principles of Instrumental Analysis*, 7th ed.; Cengage Learning, 2016.