Electronic Supplementary Information (ESI)

for

A CoOOH nanoflake-based light scattering probe for the simple and selective detection of uric acid in human serum

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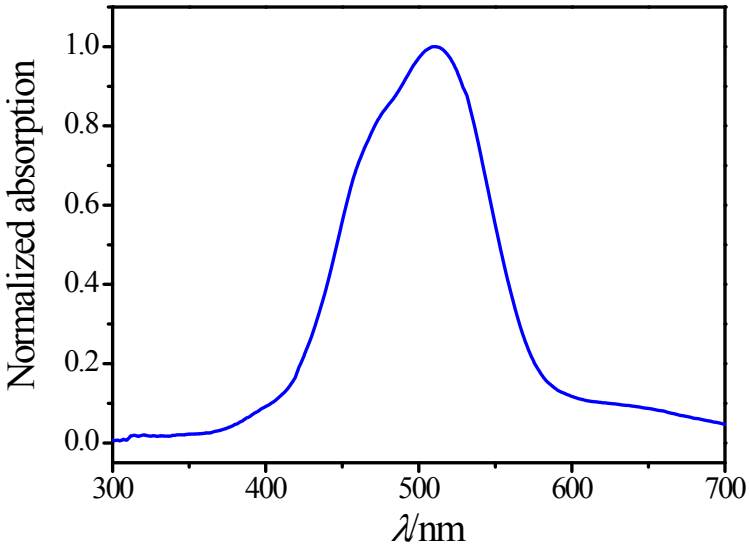

Fig. S1 The normalized absorption spectrum of Co^{2+}.

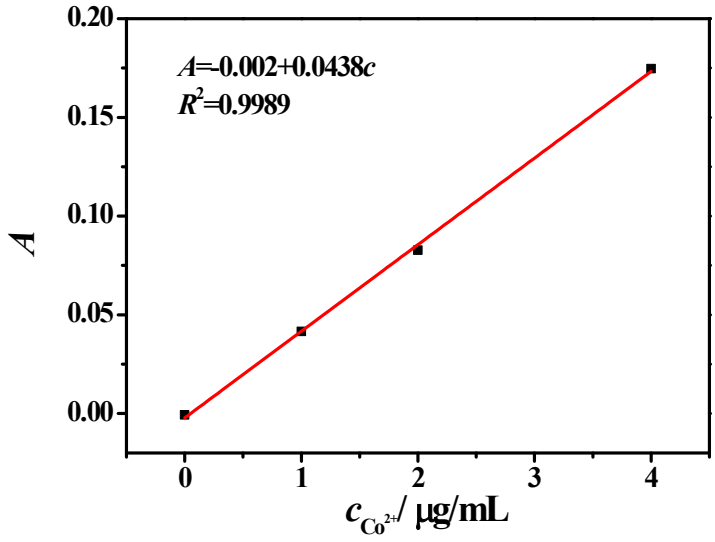

Fig. S2 The absorption standard linear curve of Co^{2+} detected by AA-7000 atomic absorption spectrophotometer. Working conditions: Wavelength: 240.7 nm; slit width: 0.2 nm; time constant: 1.0 s; lamp current: 15 mA; photomultiplier voltage: 719 V; flame Type: air-C_2H_2; fuel flow: 2.2 L/min; oxidant: 15.0 L/min at 160 kPa; burner height: 7.5 mm; delay time: 5 s; measurement time: 5 s.

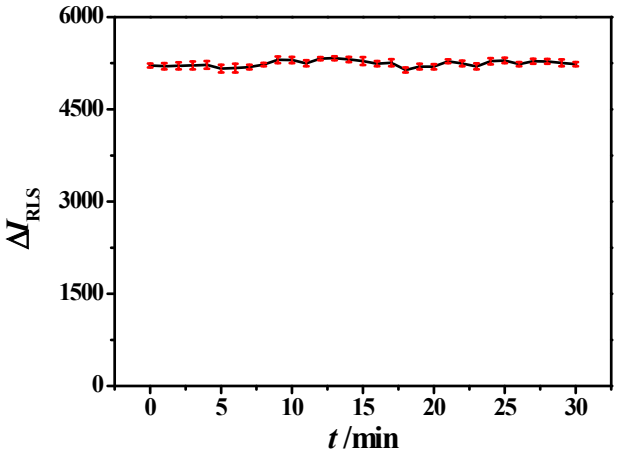

Fig. S3 The light scattering intensity CoOOH nanoflakes at pH 6.64. Conditions: CoOOH nanoflakes, 8 μM; pH 6.64.

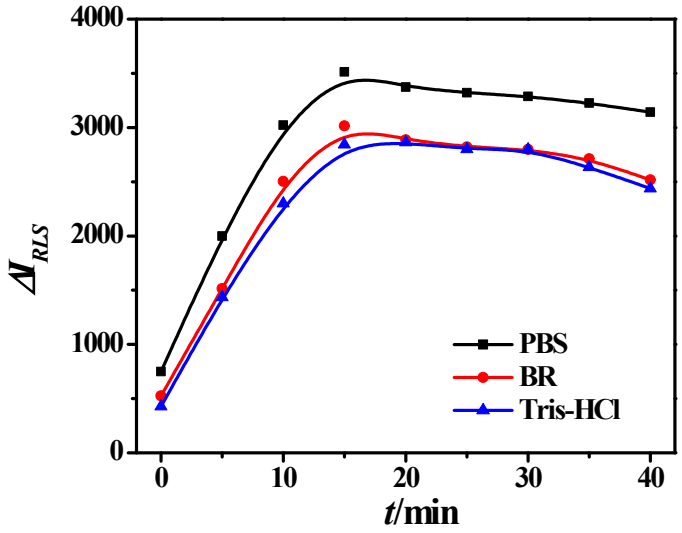

Fig. S4 The light scattering intensity change of CoOOH nanoflakes induced by H_2O_2 in diffrerent media (PBS, BR and Tris-HCl) at pH 6.64. Conditions: CoOOH nanoflakes, 8 μM; H_2O_2, 250 μM; pH 6.64; T, 45 °C.

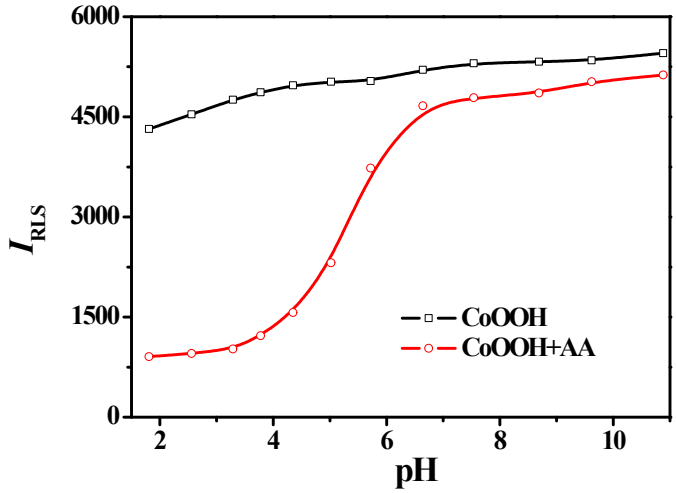

Fig. S5 The light scattering intensity of CoOOH nanoflakes in the absence or presence of AA in PBS buffer at different pH. Conditions: CoOOH nanoflakes, 8 μM; AA, 750μM; pH 6.64; T, 45 ^{o}C.

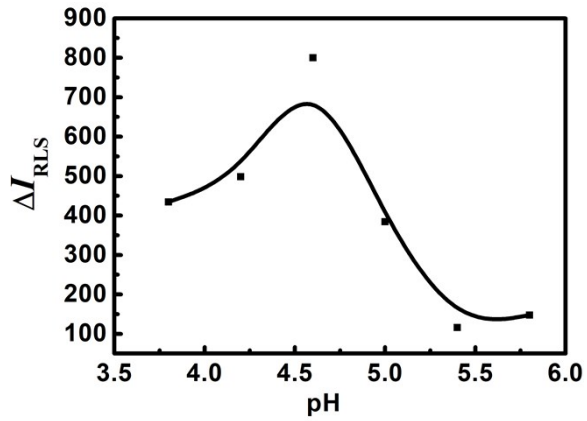

Fig. S6 The light scattering intensity change of CoOOH nanoflakes induced by GSH in PBS buffer at different pH. Conditions: CoOOH nanoflakes, 8 μM; GSH, 750 μM; pH 6.64; T, 45 ^{o}C.

Table S1 The free cobalt ions in different samples

Samples	The concentration of free cobalt ions (μg/mL)
CoOOH nanoflakes in H_2O	0.0048
CoOOH nanoflakes in BR buffer (pH 1.81)	0.0259
CoOOH nanoflakes in BR buffer (pH 6.64)	0.0066
CoOOH nanoflakes reacts with H_2O_2 in BR buffer (pH 6.64)	4.0500

Working conditions: wavelength: 240.7 nm; slit width: 0.2 nm; time constant: 1.0 s; lamp current: 15 mA; photomultiplier voltage: 719 V; flame type: air-C_2H_2; fuel flow: 2.2 L/min; oxidant: 15.0 L/min at 160 kPa; burner height: 7.5 mm; delay time: 5 s; measurement time: 5 s.

Table S2 The comparison of different methods for the determination of UA

Methods	Concentration range	LOD	Real samples	Ref.
Fluorometric assay	2 -300 μM	500 nM	Human serum and urine	[1]
Fluorometric assay	5 -100 μM	1.7 μM	Diluted human serum samples	[2]
Fluorometric assay	0.66-3.3 μM	0.044 μM	Human urine	[3]
Fluorometric assay	0.05-1.0 μM	20 nM	Human urine and serum	[4]
Fluorometric assay	0.7-80 μM	120 nM	Human blood	[5]
Fluorometric assay	10-800 μM	6.6 μM	Human serum	[6]
Fluorometric assay	2-100 μM	0.75 μM	Diluted serum samples	[7]
Fluorometric assay	0.1–100 μM	0.05 μM	Human serum and urine	[8]
Fluorometric assay	1.00×10^{-5}-5.00×10^{-5} M	5.80×10^{-6} M	Human urine	[9]
Colorimetric detection	4.5-60 μM	1.3 μM	Human urine and serum	[10]
Colorimetric detection	10-50 ppm	0.56 ppm	Human blood serum	[11]
Colorimetric detection	1.0-120 μM	0.25 μM	Human serum	[12]
Colorimetric detection	1.0×10^{-6}-1.0×10^{-4} M	10×10^{-7} M	Human serum	[13]
Colorimetric detection	1.0-40 μM	0.24 μM	Human serum	[14]
Electrochemical detection	1.0×10^{-5}-1.0×10^{-4} M	1.0×10^{-5} M	Human serum	[15]
Electrochemical method	5.0×10^{-7}-5.0×10^{-5} M	1.0×10^{-7} M	Human serum and urine	[16]
Electrochemical method	6.6-112.4 μM	3.1 μM	Human urine	[17]
Electrochemical method	5-425 μM	1.0 μM	----	[18]
Electrochemical method	0.15- 11.4 μM	0.07 μM	----	[19]
Capillary electrophoresis	10-500 μM	3.3 μM	Human urine and plasma	[20]
Flow injection	9.1×10^{-6}-9.1×10^{-2} M	0.67 μg/mL	Human urine	[21]

capillary electrophoresis with chemiluminescence	6.0×10^{-7}-3.0×10^{-5} M	3.5×10^{-7} M	Human urine	[22]
electrochemiluminescence	1.62×10^{-8} - 8.30×10^{-6} M	75 pM	porphyra and kelp	[23]
High performance liquid chromatography	0-500 μM	0.04 μM	Human plasma and urine	[24]
Reversed-phase high-performance liquid chromatography	0.07-10 mg/L	21 μg/L	Human saliva	[25]

'----' means none real samples were detected.

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