Supporting Information for

Single-Atom Cobalt-Based Electrochemical Biomimetic Uric Acid Sensor with Wide Linear Range and Ultralow Detection Limit

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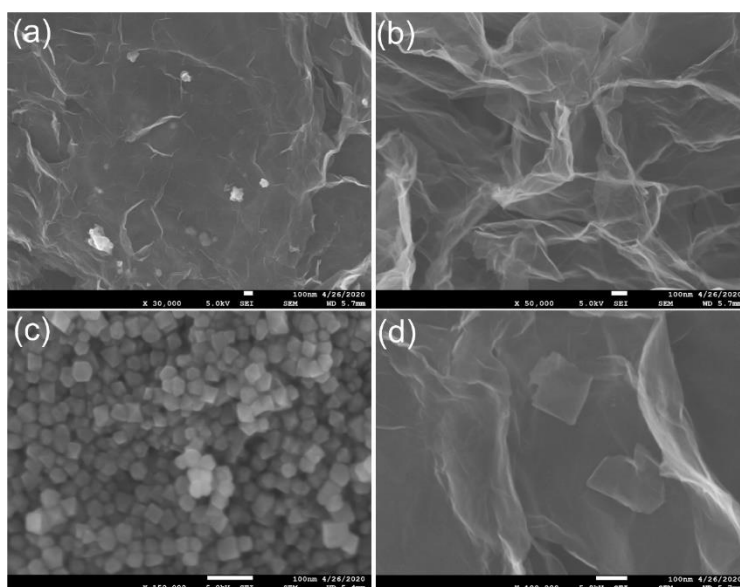
Supplementary Figures and Tables

Fig. S1 SEM image of (**a**) P-Co-NG; (**b**) NG; (**c**) Co_3O_4; (**d**) Co_3O_4/GO
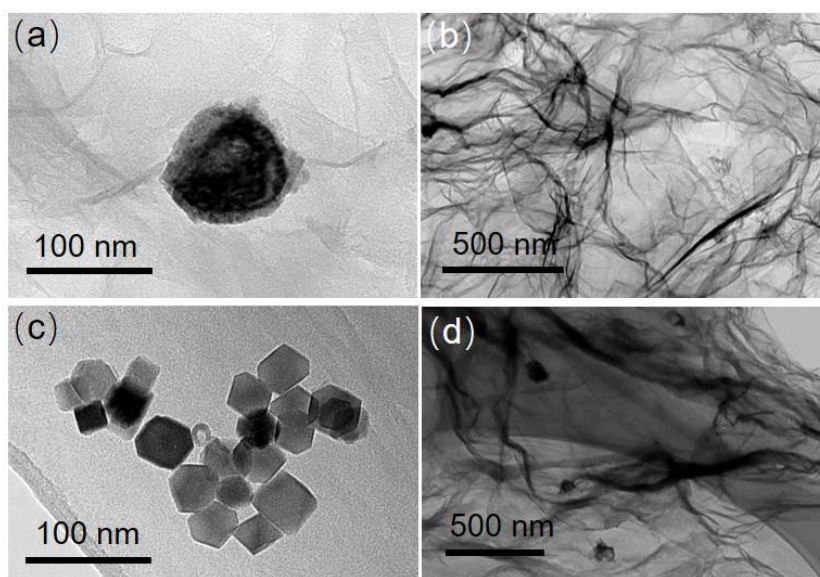
Fig. S2 TEM image of (**a**) P-Co-NG; (**b**) NG; (**c**) Co_3O_4; (**d**) Co_3O_4/GO

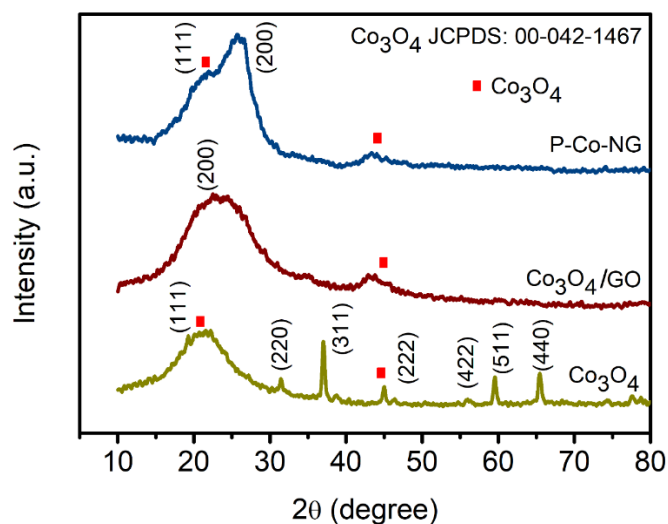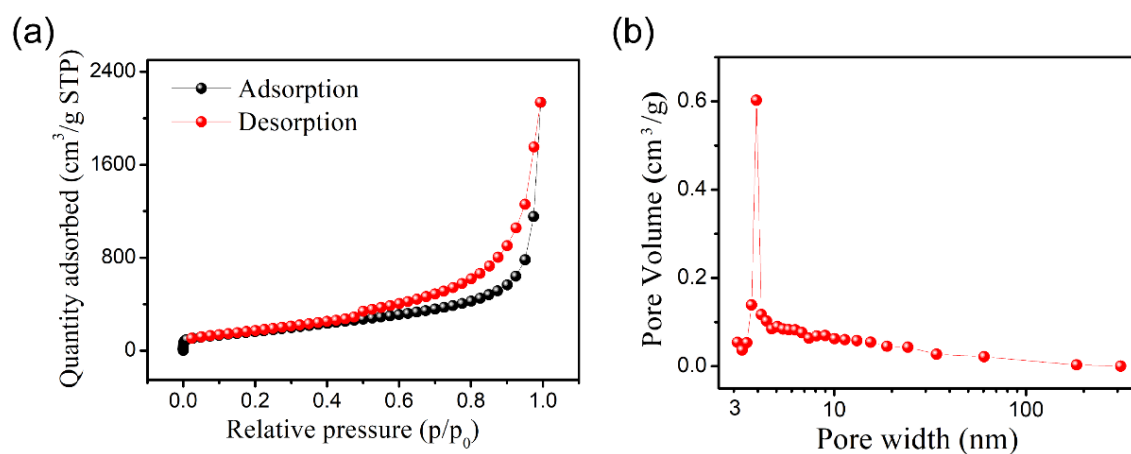**Fig. S3** XRD patterns of materials

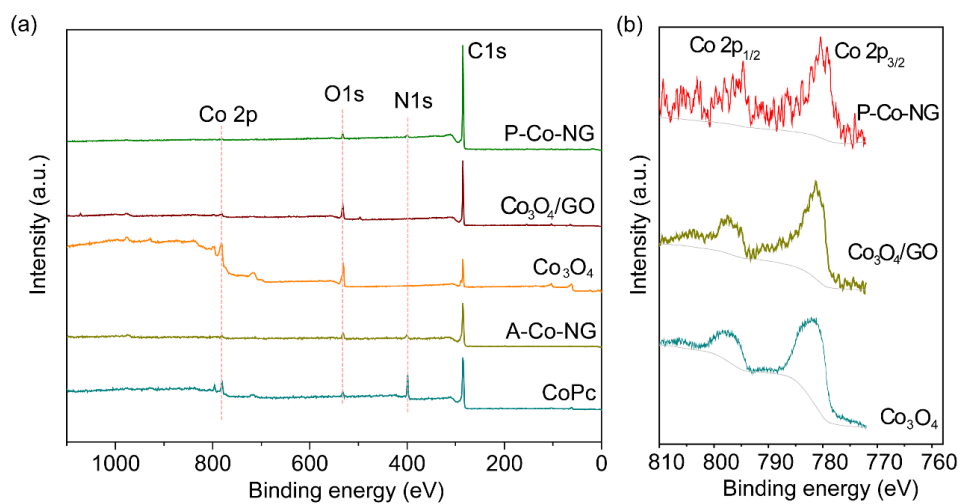**Fig. S4** BET analysis of A-CO-NG

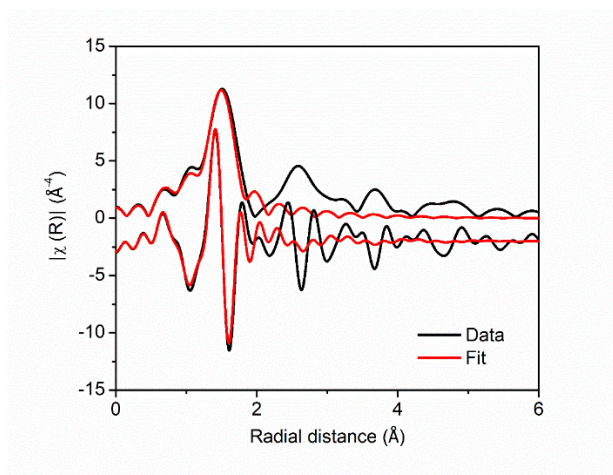**Fig. S5** XPS analysis of different samples: (**a**) full spectra; (**b**) Co 2p spectra

Fig. S6 First-shell fitting of the Fourier transformation of the EXAFS spectrum of Co-Pc (the EXAFS spectrum was fitted using the FEFF 8.2 code)
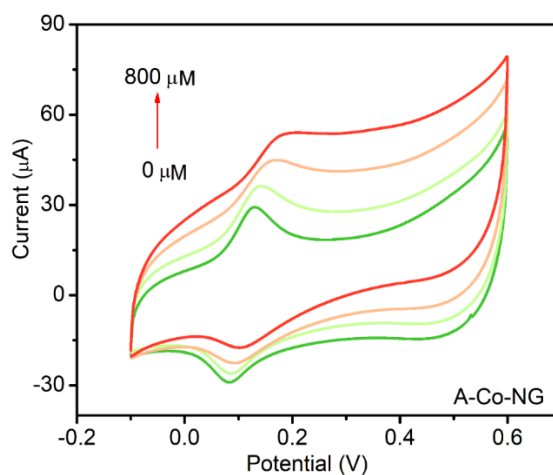

Fig. S7 CV curves of the A-Co-NG nanozyme recorded in a 0.1 M NaOH solution with increasing UA concentration
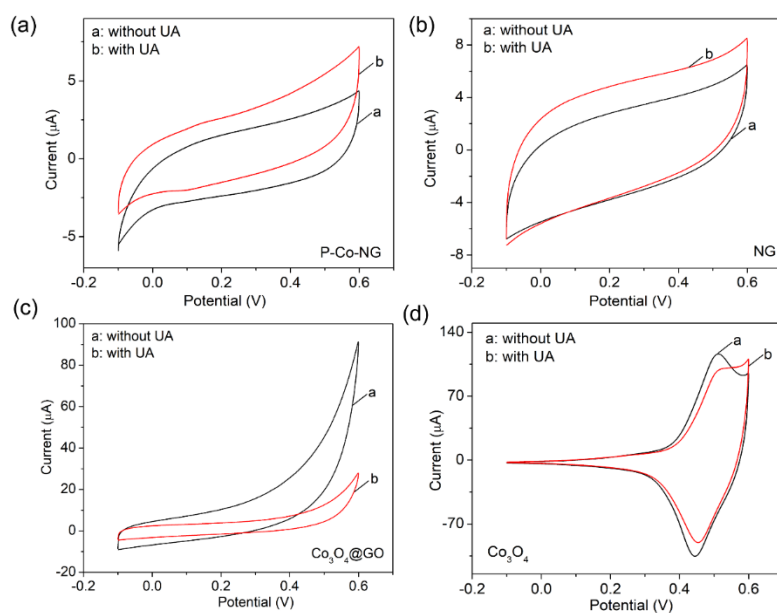
Fig. S8 CV curves of various catalysts towards **a**) without and **b**) with 400 µM UA recorded in a 0.1 M NaOH solution

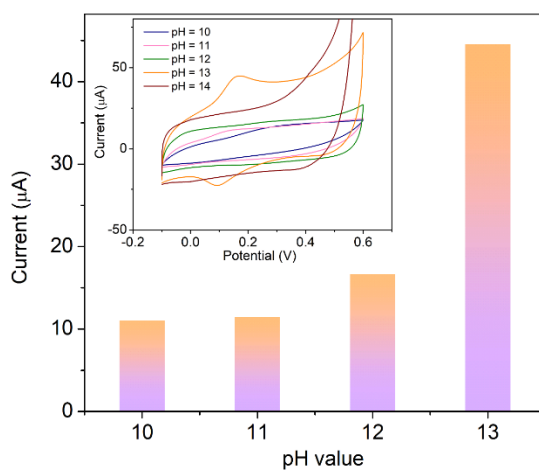**Fig. S9** The influence of pH value of test solution controlled from 10 to 14 on the electrochemical response of the A-Co-NG towards 400 µM UA
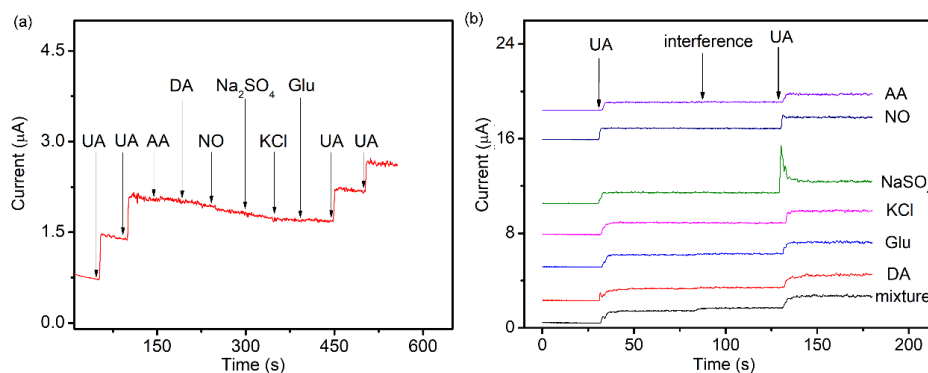

Fig. S10 (a) Selectivity for UA detection of A-Co-NG nanozyme. **(b)** Selectivity for UA detection of A-Co-NG with mixed or single interfering species
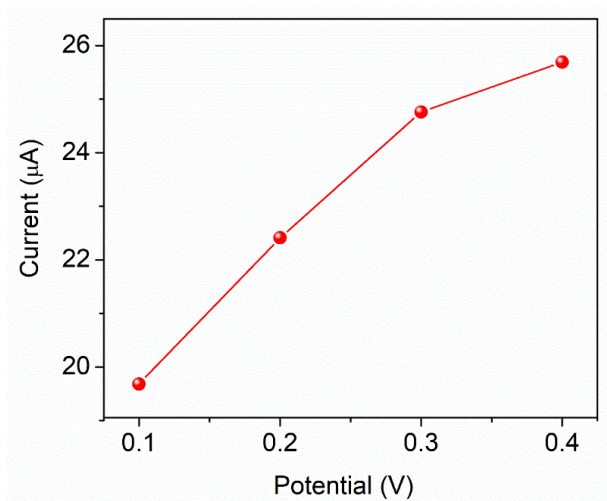
Fig. S11 The influence of applied potential controlled from 0.1 to 0.4 V vs. SCE on current response of the A-Co-NG towards 33 μM UA

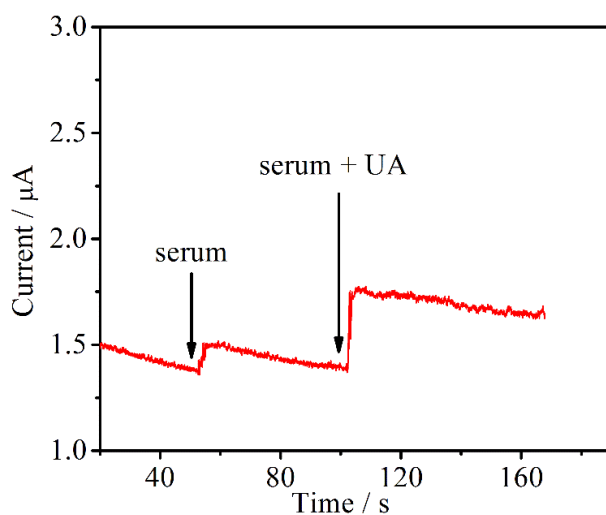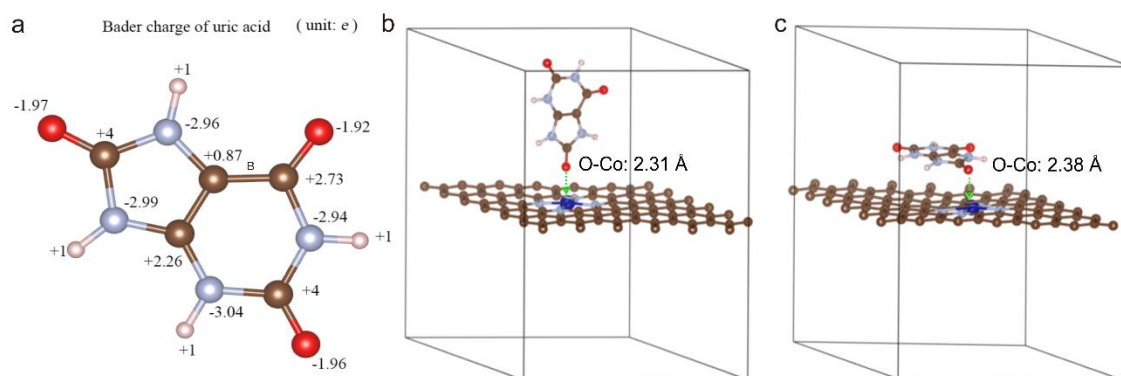**Fig. S12** Amperometric *I-t* response of A-Co-NG for serum sample detection

Fig. S13 (a) Bader charge of UA; Adsorption of UA molecule on A-Co-NG with optimized configuration of (**b**) vertical adsorption and (**c**) parallel adsorption
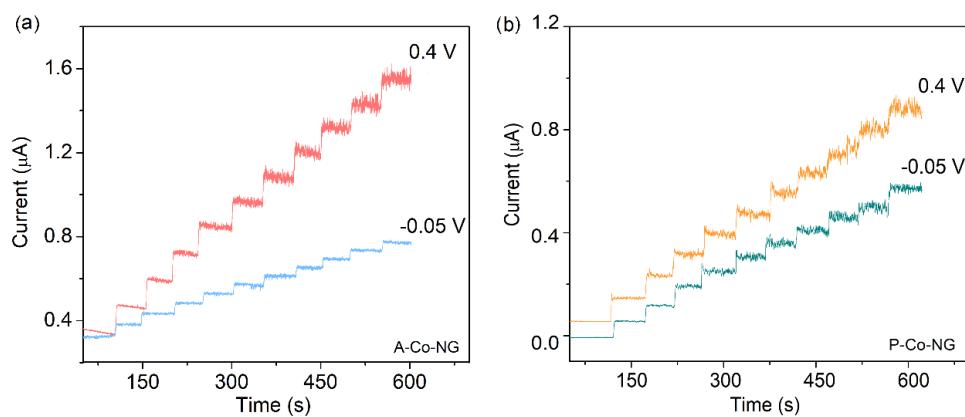
Fig. S14 Amperometric I-t response of (**a**) A-Co-NG and (**b**) P-Co-NG upon continuous injection of 5 µM UA at an applied potential of 0.4 and -0.05 V vs SCE in 0.1 M NaOH

Table S1 Best fitting EXAFS data for different Co-based catalysts

Sample	Shell	N	R (Å) (EXAFS)	ΔE (eV)	Debye-Waller factor Δσ2 (Å²)	R-factor
Co-N-G	Co-N	3.38±0.67	1.87±0.02	-3.6 ±2.4	0.005±0.002	0.0055
CoPc	Co-N	3.58±0.52	1.9±0.03	-3.6 ±3.0	0.002±0.0034	0.0085

N: coordination number.

Table S2 Results for the determination of UA in real samples

Sample	Detected (µM)	Added (µM)	Found (µM)	Recovery (%)
Serum 1	1.90	9.80	12.24	105.5
Serum 2	1.00	9.80	10.58	97.7
Serum 3	2.29	9.80	12.25	101.6