Electronic Supplementary Information

Experimental section

Materials: $Co(NO_3)_2 \cdot 6H_2O$, NH_4F, lactose, fructose, and urea were purchased from Beijing Chemical Corp. NaH_2PO_2 (Aladdin Ltd., Shanghai, China) is used for phosphorization. Uric acid, ascorbic acid and dopamine were purchased from Xilong Chemical Co. Ltd. (Guangdong, China). NaOH, ethanol, and NaCl were purchased from The Regent Chemicals Co. Ltd. (Tianjin, China). Titanium mesh (TM) was purchased from Phychemi Hong Kong Company Limited. All chemicals were used as received without further purification. Deionized (DI) water (18.2 MΩ cm) used throughout all experiments was purified through a Millipore system.

Preparation of Co(OH)F/TM and CoP NA/TM: Before experiment, TM was washed with HCl, ethanol, and water several times to remove the surface impurities. Co(OH)F/TM was prepared according to the previous reported as follows.[1] $Co(NO_3)_2 \cdot 6H_2O$ (0.291 g), NH_4F (0.093 g) and urea (0.30 g) were dissolved in 20 mL water under vigorous stirring for 30 min. Then the solution was transferred into a Teflon-lined stainless autoclave (25 mL) and a piece of TM (3 cm × 2 cm) was immersed into the solution. The autoclave was sealed and maintained at 120 °C for 6 h in an electric oven. After the autoclave cooled down slowly at room temperature, the Co(OH)F /TM was taken out and washed with water thoroughly before vacuum dried. To prepare CoP NA/TM, Co(OH)F/TM and NaH_2PO_2 were put at two separate positions in a porcelain boat with NaH_2PO_2 at the upstream side of the furnace. The molar ratio for Co to P is 1:5. Subsequently, the samples were heated at 300 °C for 120 min in a

static Ar atmosphere, and then naturally cooled to ambient temperature under Ar. The mass loading of CoP is 1.7 mg cm^{-2}.

Characterizations: Powder X-ray diffraction data (XRD) were collected on a RigakuD/MAX 2550 diffractometer with Cu Kα radiation (λ=1.5418 Å). Scanning electron microscopy (SEM) measurements were carried out on a HITACHI S-4800 field emission scanning electron microscope at an accelerating voltage of 20 kV. Transmission electron microscopy (TEM) measurements were carried out on a Zeiss Libra 200FE transmission electron microscope operated at 200 kV. X-ray photoelectron spectroscopy (XPS) measurements were performed on an ESCALABMK II X-ray photoelectron spectrometer using Mg as the exciting source

Electrochemical measurements: Electrochemical measurements were performed with a CHI 660E electrochemical analyzer (CH Instruments, Inc., Shanghai) in a standard three-electrode system containing 0.1 M NaOH solution at room temperature, using CoP NA/TM as working electrode (0.2 cm × 0.2 cm), platinum wire as counter electrode and Hg/HgO as reference electrode, and the equivalent relative to reversible hydrogen electrode (RHE) according to E (RHE) = E (Hg/HgO) + 0.866.

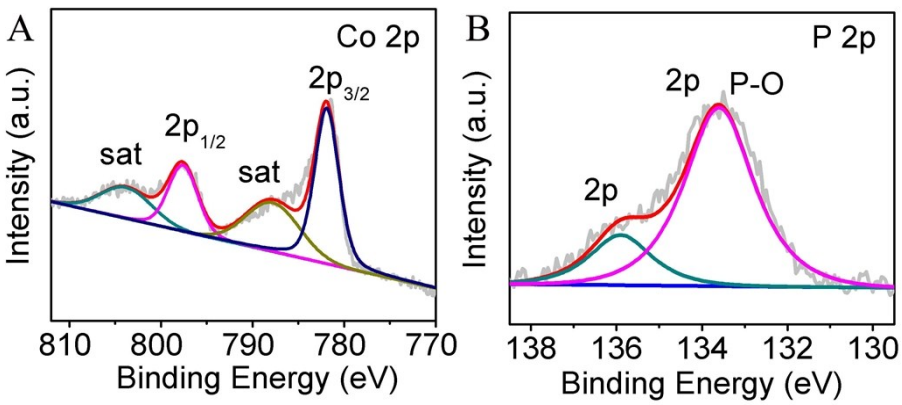

Fig. S1. XPS spectra of (A) Co 2p and (B) P 2p for CoP NA after potential cycing in 0.1 M NaOH.

Table S1. Sensing performance comparison of CoP NA/TM with other non-enzymatic glucose sensors.

Electrodes	Sensitivity ($\mu A\ mM^{-1}\ cm^{-2}$)	Linear range (mM)	LOD (μM)	Ref.
CoP NA/TM	5168.6	0.0005-1.5	0.1	This work
CoP NRs/GCE	116.8	0-5.5	9	2
CoOOH nanosheets	341	0.03-0.7	30.9	3
Porous CoOOH NAs	526.8	0.003-1.109	1.37	4
NCoNWs/Nafion/GCE	300.8	0.005-0.57	5	5
TiO_2/Co_3O_4 ANTAs	2008.82	0-3.0	0.3396	6
Co_3O_4-NWs	45.8	0.0001-1.2	0.0265	7
Co_3O_4 /PbO_2 NRs	460.3	0.005-1.2	0.31	8
CTAB-Co_3O_4	1440	0.005-12	0.08	9
Co_3O_4 NFs-Nafion/GCE	36.25	0-2.04	0.97	10
Co_3O_4 NDs-GCE	27.33	0.5-5.0	0.8	11
Co_3O_4/GCE-Nafion	1618.71	0.1-5.0	0.1	12
CNFS/$Co(OH)_2$	68000	0.01-0.12	5	13
CoOxNPs/ERGO	79.3	0.01-0.55	2	14
CoO NRs/FTO	571.8	0.2-3.5	0.058	15
CoOx·nH_2O-MWCNTs	162.8	0-4.5	2	16
CoNPs/ITO	1720	0.005-0.18	0.25	17
Porous Co NBs/rGO	39.32	0.15-6.25	47.5	18
NiO nanosheet	1138	0.001-0.4	0.18	19
NiO HSs/GCE		0.002-0.01 0.05-3.3	0.3	20
Mesoporous CuO		0.0005-0.005 0.01-0.1	0.23	21

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