

Supporting Information

Experimental section

Apparatus and reagents

Nickel foam (NF) (thickness: 1.8 mm, pore density: 110 ppi) was used as the scaffold. $\text{Co}(\text{NO}_3)_2 \cdot 6\text{H}_2\text{O}$, Cetyltrimethylammonium bromide (CTAB), β -D-glucose, ascorbic acid, uric acid and other reagents were all of analytical grade and used without further purification. Scanning electron microscopy (SEM) analysis was performed using a Hitach S-4800 microscope. Transmission electron microscopy (TEM) images were obtained with a FEI Tecnai G²F30 microscope. X-Ray diffraction patterns (XRD) were recorded with a Rigaku D/M ax-2400 X-ray diffractometer at a 2θ range of 10° - 80° . All of the electrochemical experiments were performed using a CHI660D electrochemical workstation using a three-electrode system: platinum plate as the auxiliary electrode, standard Hg/HgO electrode as the reference electrode and the 3D electrode decorated with as-prepared samples as the working electrode. CV experiments were carried out over the potential range from 0.0 V to 0.8 V using a 0.5 M NaOH solution or a mixture contained 0.5 M NaOH and a certain concentration of glucose as the supporting electrolyte. The scan rate of all the CVs is 20 mV/s. For amperometric detection all measurements were performed by applying an appropriate potential to the working electrode and allowing the transient background current reach to a steady-state value before the addition of analyte. A stirred 0.5 NaOH solution was employed to provide convective transport.

Preparation of electrode

In a typical synthesis, 0.364 g cobalt nitrate ($\text{Co}(\text{NO}_3)_2 \cdot 6\text{H}_2\text{O}$), 0.2 g ammonium fluoride (NH_4F), 0.75 g urea and 0.25g CTAB were dissolved in 35 mL ultrapure water at room temperature. After stirring for 30 min, the homogeneous solution was transferred into a 50 mL Teflon-lined stainless steel autoclave and hereafter a piece of cleaned nickel foam was immersed in the reaction solution against the inner wall of the autoclave. The autoclave was sealed and maintained at 120 °C for 10 h. After cooling down to room temperature spontaneously, the substrate was taken out, rinsed with distilled water several times in order to remove the residual reactant. Finally, the as-prepared precursor was converted to Co_3O_4 at 350 °C for 3 h with a heating rate of 4 °C per minute. For comparison, another sample was synthesized using the same procedure but no addition of CTAB. The as-prepared samples denoted as CTAB- Co_3O_4 and Co_3O_4 , respectively.

The as-prepared active materials are scraped from the nickel foam and dispersed in ethanol. Then, 10 μL (0.5 mg/mL) Co_3O_4 NF solution was delivered to another cleaned nickel foam (1 cm × 0.5 cm) surface and dried in air. At last, 5 μL Nafion solution (0.5 wt% in ethanol) was cast on the layer of Co_3O_4 in order to entrap the active material.

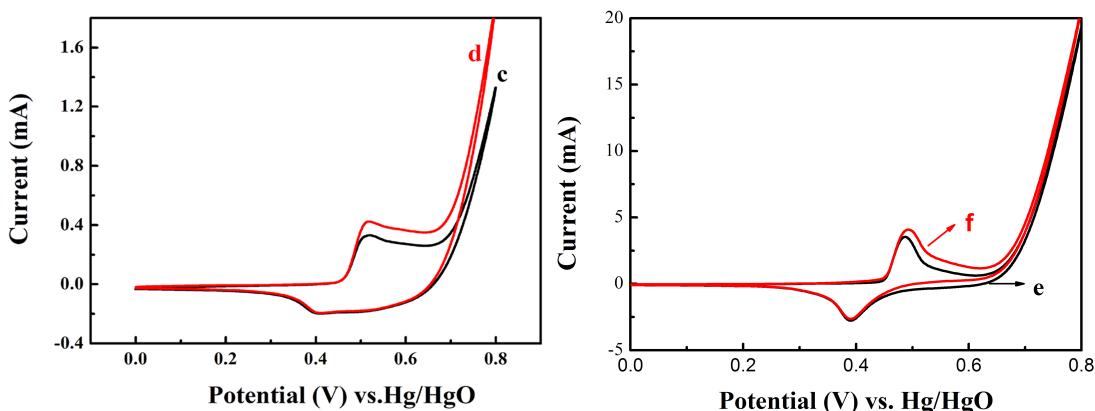


Fig. S1 CVs of the CTAB-Co₃O₄ NFs on the GCE (c, d) and bare nickel foam (e, f) in the absence (c, e) and presence of 1 mM glucose(d, f), respectively.

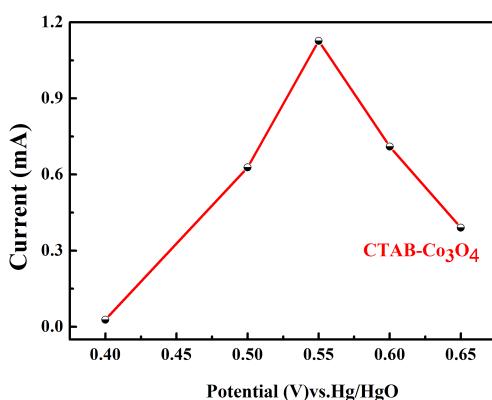


Fig. S2 The potential versus current plot of 2 mM glucose at the CTAB-Co₃O₄ NFs electrode.

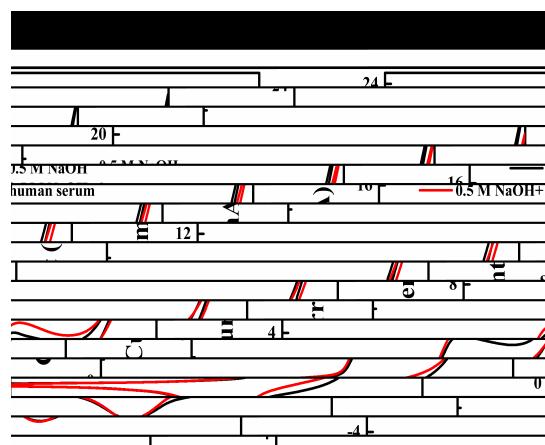


Fig. S3 CVs of CTAB-Co₃O₄ electrode in human serum with 0.5 M NaOH supporting

electrolyte (red line) and 0.5 M NaOH supporting electrolyte only (black line)

Table S1: Determination of glucose in human serum samples by the CTAB-Co₃O₄ NFs electrode

Samples	Determined values	Reference values	Relative deviations (n=3)
1	15.2	15.04	1.4%
2	6.0	6.12	0.72%
3	4.05	4.16	2.5%