

## Supporting Information

### **Electrochemical performance of ruthenium nanoparticles decorated on nitride carbon for non-enzymatic detection of hydrogen peroxide**

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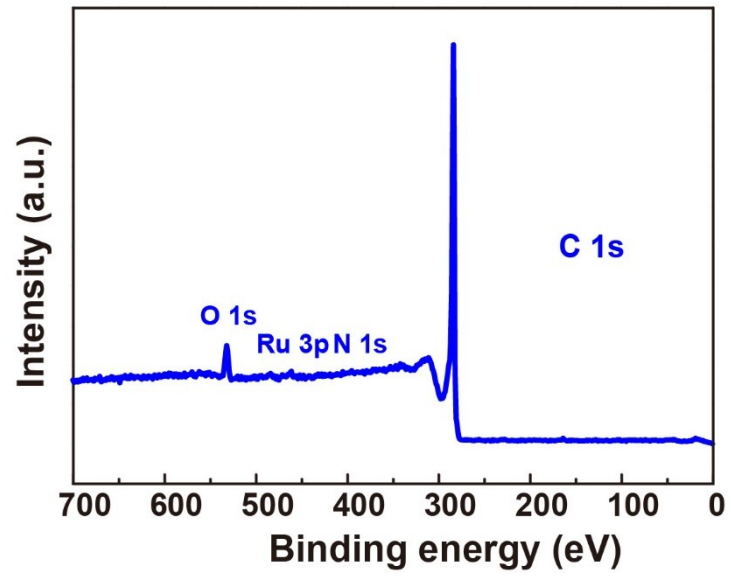
Email: fanguangyin@scicnu.edu.cn (G.Y. Fan).

## **Experimental**

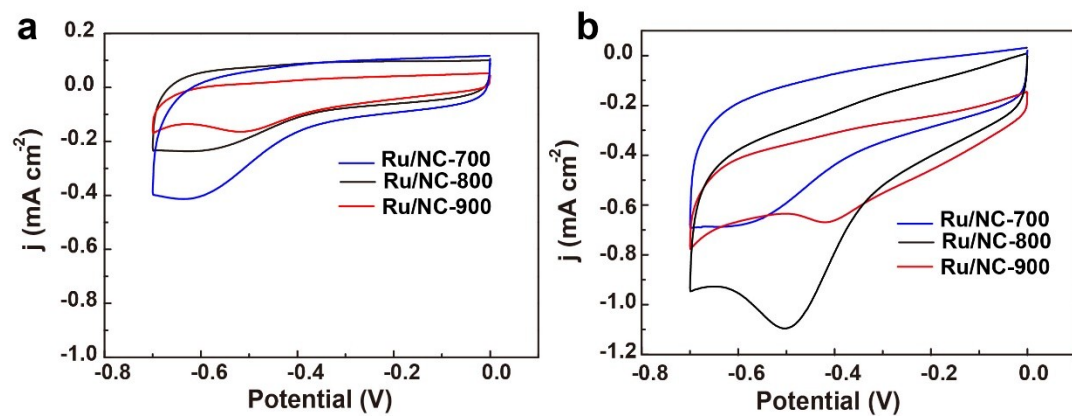
### **Materials**

Sodium chloride (NaCl), fructose (Fru), urea (Urea), dopamine (DA), ascorbic acid (AA), uric acid (UA), hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>), methanol, and TBRC were purchased from Aladdin Industrial Inc. Nafion (5 wt%) was bought from Sigma-Aldrich. Carbon black (Vulcan XC-72R) was obtained from Carbot Corp. K<sub>2</sub>HPO<sub>4</sub>·3H<sub>2</sub>O and KH<sub>2</sub>PO<sub>4</sub>·3H<sub>2</sub>O were purchased from Chengdu Kelong reagent Co., Ltd. De-ionized (DI) water was used for preparing samples and electrochemical measurements.

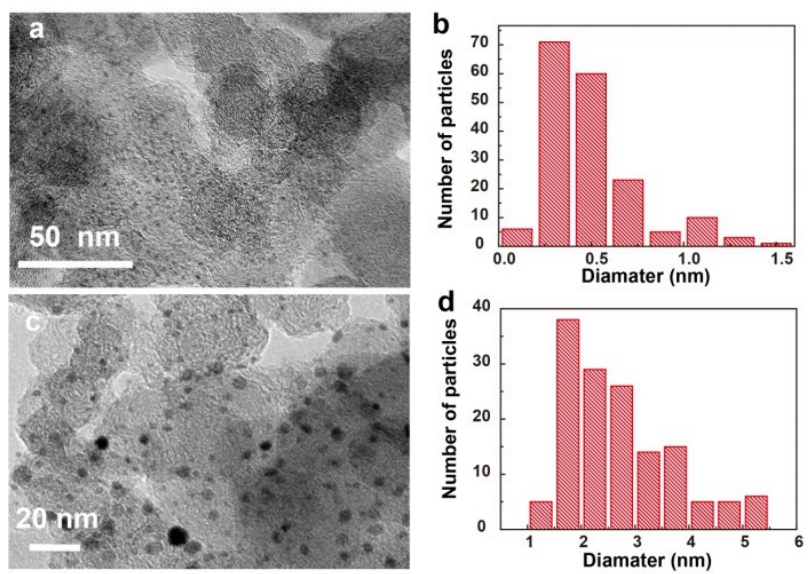
**Synthesis of NC:** 0.25 g of XC-72 carbon and 0.35 g of urea were physically ground and sealed in a crucible. The mixture was annealed at 150 °C for 2 h and then 300 °C for another 2 h. The obtained product was washed with water and ethanol for 3 times and dried at 60 °C.



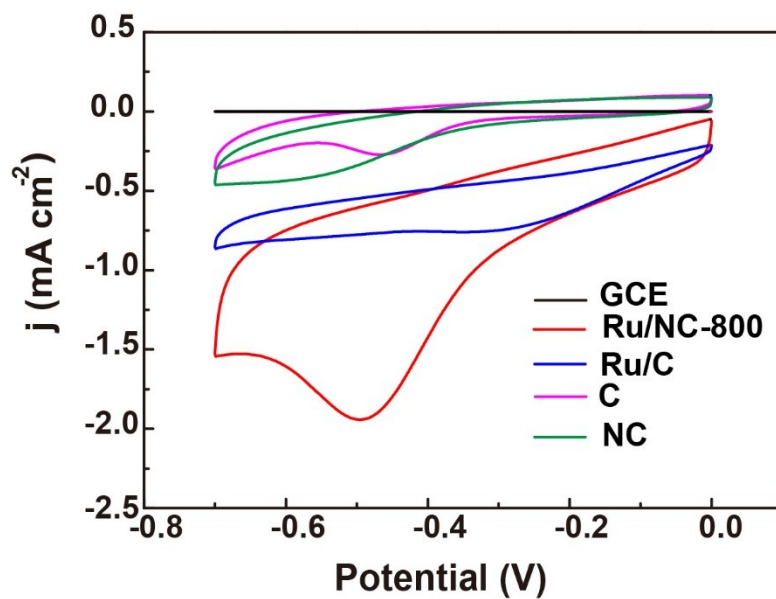
**Figure S1.** XPS scan survey of Ru/NC-800.



**Figure S2.** CV curves of Ru/NC-700, Ru/NC-800, Ru/NC-900 in 0.1 M PBS at a scan rate 50 mV s<sup>-1</sup> in (a) 0 mM H<sub>2</sub>O<sub>2</sub> and (b) 4 mM H<sub>2</sub>O<sub>2</sub> with potential range of 0 to - 0.7 V.



**Figure S3.** TEM images and corresponding size distribution of (a, b) Ru/NC-700 and (c, d) Ru/NC-900.



**Figure S4.** CV curves of GCE, C, NC, Ru/C, Ru/NC-800 in 0.1 M PBS at a scan rate  $50 \text{ mV s}^{-1}$  in  $5 \text{ mM H}_2\text{O}_2$  with potential range of 0 to  $-0.7 \text{ V}$ .

Table S1 Detection of H<sub>2</sub>O<sub>2</sub> in real samples

Food Samples	Added ( $\mu\text{M}$ )	Found ( $\mu\text{M}$ )	Recovery (%)
Orange juice	10	9.22	92.2
Milk	10	8.96	89.6