Electronic Supplementary Information (ESI) for

Cu@Ni core-shell nanoparticles/reduced graphene oxide nanocomposites for nonenzymatic glucose sensor†

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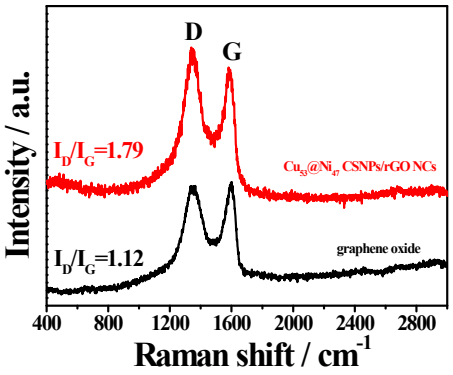

Fig. S1 Raman spectra of graphene oxide (black line) and $Cu_{53}@Ni_{47}$ CSNPs/rGO NCs (red line).

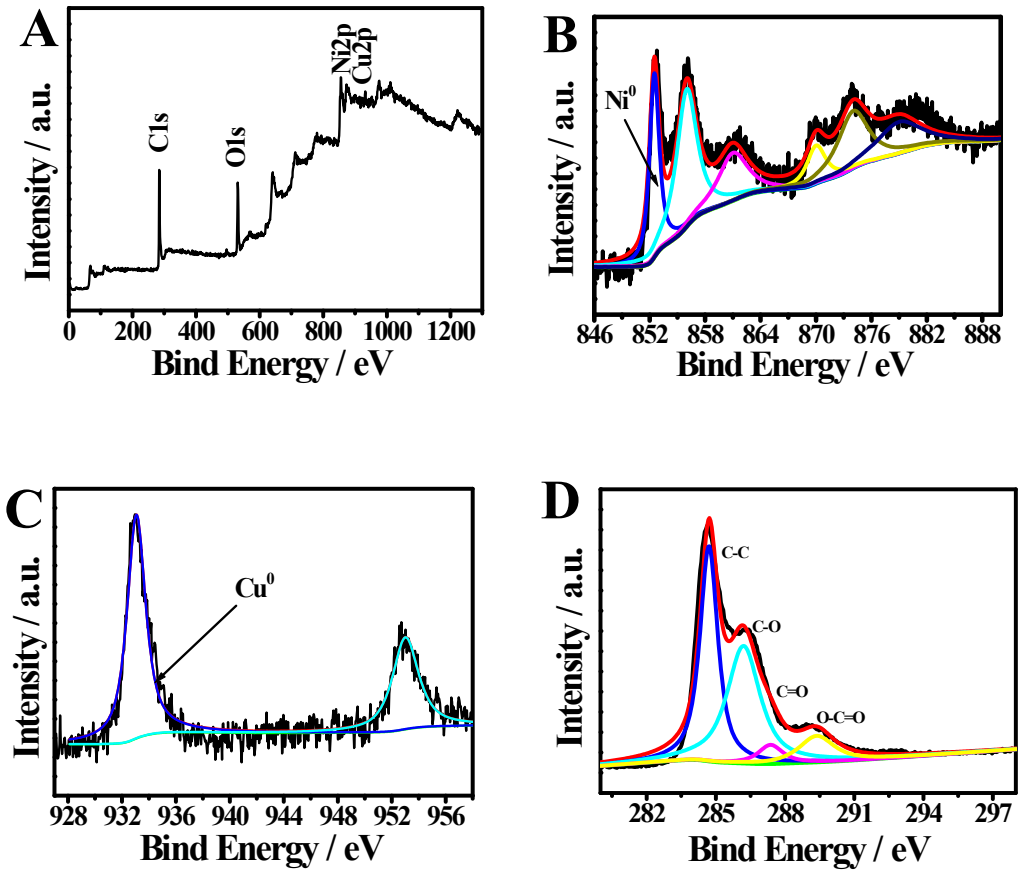

Fig. S2 XPS spectra of $Cu_{53}@Ni_{47}$ CSNPs/rGO NCs: (a) survey spectrum, (b) Ni2p region, (c) Cu2p region, and (d) C1s region, respectively.

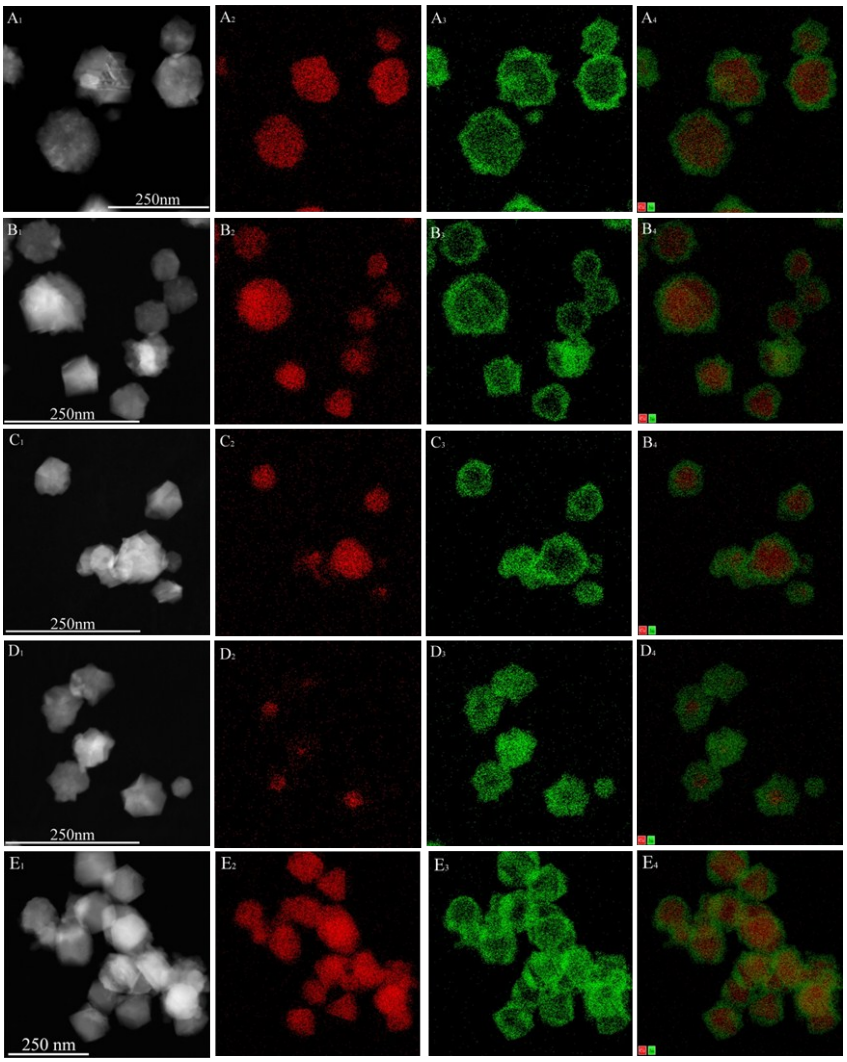

Fig. S3 STEM-HAADF image (A_1–E_1), STEM-EDX maps in Cu Kα1 signals (A_2–E_2) and Ni Kα1 signals (A_3–E_3), and overall map (A_4–E_4) for $Cu_{70}@Ni_{30}$ CSNPs/rGO NCs (A), $Cu_{63}@Ni_{37}$ CSNPs/rGO NCs (B), $Cu_{38}@Ni_{62}$ CSNPs/rGO NCs (C), $Cu_{21}@Ni_{79}$ CSNPs/rGO NCs (D), and $Cu_{52}@Ni_{48}$ CSNPs (E), respectively.

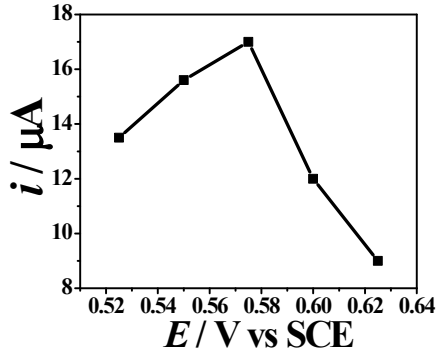

Fig. S4 Effect of the applied potential on peak current to 0.5 mM glucose for $Cu_{53}@Ni_{47}$ CSNPs/rGO/Nafion/GCE.

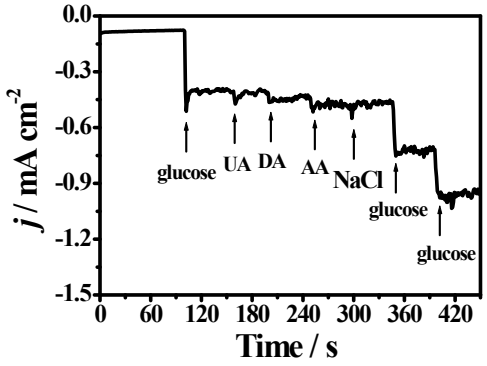

Fig. S5 Amperometric response of the $Cu_{53}@Ni_{47}$ CSNPs/rGO/Nafion/GCE with successive addition of 0.5 mM glucose, 0.1 mM UA, 0.1 mM DA, 0.1 mM AA, and 0.1 mM NaCl in 0.1 M NaOH solution at +0.575 V, respectively.

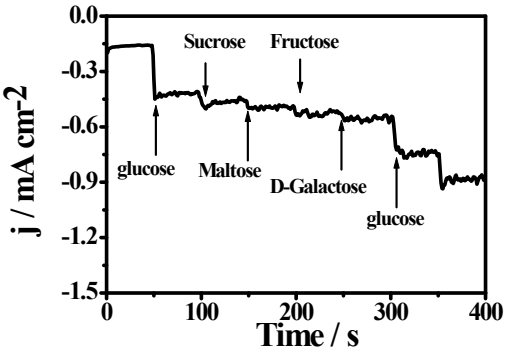

Fig. S6 Amperometric response of the $Cu_{53}@Ni_{47}$ CSNPs/rGO/Nafion/GCE with successive addition of 0.5 mM glucose, 0.1 mM sucrose, 0.1 mM maltose, 0.1 mM fructose, 0.1 mM D-galactose, 0.5 mM glucose in 0.1 M NaOH solution at +0.575 V, respectively.

Table S1

Molar ratio of Cu/Ni and quality ratio of $Cu_x@Ni_{100-x}$ to rGO sheets in each $Cu_x@Ni_{100-x}$ CSNPs/rGO NCs are determined by ICP-AES analysis.

Initial composition	Final composition	Quality ratio of $Cu_x@Ni_{100-x}$ to rGO sheets
$Cu_{50}@Ni_{50}$	$Cu_{52}@Ni_{48}$	–
$Cu_{75}@Ni_{25}$/rGO	$Cu_{70}@Ni_{30}$/rGO	2.83:1
$Cu_{66.7}@Ni_{33.3}$/rGO	$Cu_{63}@Ni_{37}$/rGO	2.91:1
$Cu_{50}@Ni_{50}$/rGO	$Cu_{53}@Ni_{47}$/rGO	3.02:1
$Cu_{33.3}@Ni_{66.7}$/rGO	$Cu_{38}@Ni_{62}$/rGO	3.00:1
$Cu_{25}@Ni_{75}$/rGO	$Cu_{20}@Ni_{80}$/rGO	2.85:1

Table S2

Net current contribution for glucose oxidation using $Cu_x@Ni_{100-x}$ CSNPs/rGO NCs with different final Cu: Ni molar ratios in NCs.

Cu: Ni	Net current (μA)
70: 30	3
63: 37	19
53: 47	23
38: 62	13
20: 80	11